

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF NORTH CAROLINA
CHARLOTTE DIVISION
Civil Case No. 3:13-cv-00706**

DUKE ENERGY PROGRESS, INC.)
)
 Plaintiff,)
)
 v.)
)
 NATIONAL MARINE FISHERIES)
 SERVICE; UNITED STATES)
 DEPARTMENT OF COMMERCE;)
 PENNY PRITZKER, in her official capacity)
 as Secretary of Commerce; **ROY E.**)
 CRABTREE, in his official capacity as)
 Regional Administrator, Southeast Region,)
 National Marine Fisheries Service,)
)
 Defendants.)

SETTLEMENT AGREEMENT

WHEREAS, Plaintiff Duke Energy Progress, Inc. (“Duke Energy”) filed this action on December 23, 2013 pursuant to the Endangered Species Act (“ESA”), 16 U.S.C. § 1531 *et seq.*, and its implementing regulations, 50 C.F.R. Part 402, and the Administrative Procedure Act (“APA”), 5 U.S.C. § 701 *et seq.*, challenging the National Marine Fisheries Service’s (“NMFS”) Biological Opinion (“BiOp”) on the effects of the relicensing of the Yadkin-Pee Dee Hydroelectric Project (“Project”);

WHEREAS, in 2007, the Federal Energy Regulatory Commission (“FERC”) requested consultation with NMFS on FERC’s proposal (a) to relicense the Project, (b) to require Duke Energy to make certain improvements to the quality and quantity of water flows from the Project, and (c) to require Duke Energy to construct new facilities for fish passage (collectively, FERC’s “Proposed Action”);

WHEREAS, on April 29, 2013, NMFS issued a BiOp which concluded that the Proposed Action would not jeopardize the continued existence of the endangered shortnose and Atlantic sturgeon (“sturgeon”), provided that Duke Energy would undertake the measures required by FERC and included an incidental take statement that specified reasonable and prudent measures (“RPMs”) identified by NMFS;

WHEREAS, the RPMs in the BiOp included three provisions for monitoring the effects of the Proposed Action on sturgeon and their habitat (RPMs 3, 4, and 5 in the BiOp);

WHEREAS, after the filing of the Complaint, NMFS developed four alternative monitoring measures to replace the three monitoring RPMs, and NMFS believes the alternatives are equally effective approaches for monitoring the effects of the Proposed Action on sturgeon and their habitat;

WHEREAS, the four alternative monitoring measures are as follows:

- (1) A spawning and incubation habitat characterization assessment to determine the amount of suitable sturgeon spawning and incubation habitat created as a result of the minimum flows and actual flows provided under the new license;
 - (2) Water quality monitoring equipment installed at the Jones Creek Shoal (located between River Mile 177.2 and 177.6, approximately 11 river miles downstream of Blewett Falls Dam) to track trends of dissolved oxygen and temperature at this location in the Pee Dee River;
 - (3) A sturgeon movement study utilizing telemetry tracking to determine where the expanded spawning and incubation habitat in the area between the Blewett Falls Dam and Cheraw, SC near the Highway 1 Bridge (RM 164.8) is being utilized by sturgeon;
- and

(4) Sturgeon behavior and abundance monitoring using side scan and Didson sonar to assess the distribution and relative abundance of adult sturgeon and to assess any changes in the composition of the habitat substrate.

WHEREAS, to implement the four alternative monitoring measures NMFS developed sampling and analysis protocols, which are reflected in the Sturgeon Monitoring Framework (“Framework”) that is attached hereto as Appendix A;

WHEREAS, NMFS intends to revise the BiOp, consistent with the ESA and its implementing regulations;

WHEREAS, NMFS has established a schedule for revising the BiOp in a timely manner, while allowing for comment from Duke Energy in the revision process, as contemplated by ESA regulations, 50 C.F.R. Sec. 402.14;

WHEREAS, Duke Energy and NMFS (“Parties”) enter into this Settlement Agreement without any admission of fact or law, or any waiver of any factual or legal claims and defenses that they might have; and

WHEREAS, the Parties recognize, and the Court by approving this Settlement Agreement finds, that this Settlement Agreement has been negotiated by the Parties in good faith and will avoid litigation, and that this Settlement Agreement is fair, reasonable, and in the public interest;

NOW, THEREFORE, IT IS HEREBY ADJUDGED, ORDERED, AND AGREED as follows:

REVISIONS TO THE BIOLOGICAL OPINION

1. Within fifteen (15) days of the date of judicial approval of this Settlement Agreement, NMFS shall notify FERC that it is revising the April 29, 2013 BiOp.

2. Within ninety (90) days of the date of judicial approval of this Settlement Agreement, NMFS shall provide to Duke Energy a Draft Revised BiOp. NMFS shall base the monitoring provisions of the Draft Revised BiOp on the Framework; provided, however, that in issuing the Final Revised BiOp NMFS shall retain its full discretion to make any changes to the BiOp that it deems necessary and appropriate to ensure compliance with the ESA, the APA, and any other applicable law.

3. In transmitting the Draft Revised BiOp, NMFS will indicate whether it varies from the Framework, and if so how it varies from the Framework and the reason for any variation.

4. Within thirty (30) days of receiving NMFS' Draft Revised BiOp, Duke Energy shall provide its comments to NMFS in writing. The Parties may agree to an extension of this deadline by no more than an additional thirty (30) days.

5. Within thirty (30) days of providing written comments to NMFS on the Draft Revised BiOp, Duke Energy may request a meeting with NMFS to discuss its comments. NMFS agrees to meet with Duke Energy, either by phone or in person, within fourteen (14) days of a request for a meeting.

6. If Duke Energy has not requested a meeting with NMFS within thirty (30) days of Duke Energy's deadline to provide comments to NMFS in accordance with Paragraph 5, NMFS shall issue its Final Revised BiOp within thirty (30) days after that comment period.

7. If Duke Energy requests a meeting with NMFS within thirty (30) days of Duke Energy's deadline to provide any comments to NMFS in writing in accordance with Paragraph 5, NMFS shall issue its Final Revised BiOp within thirty (30) days after the meeting with Duke

Energy, unless the Parties mutually agree to extend the time by no more than thirty (30) days for issuance of a Final Revised BiOp to allow for additional communications.

GENERAL PROVISIONS

8. No provision of this Settlement Agreement shall be interpreted as or constitute a commitment or requirement that NMFS take any action in contravention of the ESA, the APA, or any other law or regulation, either substantive or procedural.

9. Nothing in this Settlement Agreement shall be construed to limit or modify the discretion accorded to NMFS by the ESA, the APA, or other applicable law.

10. This Settlement Agreement shall not be enforceable in the first instance through a proceeding for contempt of court.

11. The Parties agree that this Settlement Agreement was negotiated in good faith and it constitutes a settlement of Duke Energy's claims, which were denied and disputed by NMFS. By entering into this Settlement Agreement, the Parties do not waive or limit any claim or defense, on any grounds, related to any final agency action taken in the future.

12. Upon approval of this Settlement Agreement by the Court, Duke Energy's claims in this action shall be nominally dismissed.

13. Notwithstanding the nominal dismissal of this action, the Parties hereby stipulate and respectfully request that the Court retain jurisdiction to oversee compliance with the terms of this Settlement Agreement and to resolve any motions to modify such terms.

14. Within forty-five (45) days after NMFS issues a Final Revised BiOp, Duke Energy shall file a formal stipulation of dismissal unless during that time period it moves the Court for leave to reopen this action and supplement its Complaint in order to challenge the Final Revised BiOp. If Duke Energy so moves the Court and the motion is granted, the Parties agree

that the Defendants shall have sixty (60) days to respond to the supplemental Complaint and thereafter the Parties shall jointly propose for the Court's approval a new schedule for filing the new administrative record and summary judgment briefing.

15. The Parties may, without leave of Court, agree to modify the deadlines set forth herein by no more than thirty (30) days.

16. This Settlement Agreement, including the Framework, constitutes the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied herein and supersedes all prior agreements and understandings, whether oral or written. No other document, nor any representation, inducement, agreement, understanding, or promise, constitutes any part of this Agreement or the settlement it represents, nor shall it be used in construing the terms of this Agreement.

17. This Settlement Agreement may be executed in counterparts, and its validity shall not be challenged on that basis.

18. Each of the signatories below represents that he or she is fully authorized to enter into and execute the terms and conditions of this Settlement Agreement on behalf of the respective Party that he or she represents.

19. Each Party agrees to pay its own attorneys' fees and costs in this action, except that both Parties reserve the right to recover attorneys' fees and costs incurred in enforcing the terms of this Settlement Agreement.

20. This Settlement Agreement shall become effective upon the date of its approval by the Court.

EFFECT OF SETTLEMENT

21. If for any reason the Court does not approve this Settlement Agreement, the obligations of the Parties set forth herein shall be considered null and void, and each Party shall retain any claims and defenses it may have had in this action.

22. This Settlement Agreement does not limit or affect the rights of Duke Energy or the Defendants against any third parties.

23. This Settlement Agreement shall not be construed to create rights in, or grant any cause of action to, any third party not party to this Settlement Agreement.

For the Plaintiff, Duke Energy Progress, Inc.:

8/26/14
Date

/s/ Garry S. Rice
Garry S. Rice, Esq.
Deputy General Counsel
Office of the General Counsel
Duke Energy Corporation
550 South Tryon Street
Mail Code DEC45A
Charlotte, NC 28202

8/26/14
Date

/s/ Debbie W. Harden
Debbie W. Harden (N.C. Bar No. 10576)
Russ Ferguson (N.C. Bar No. 39671)
WOMBLE CARLYLE SANDRIDGE & RICE, LLP
One Wells Fargo Center, Suite 3500
301 S. College Street
Charlotte, NC 28202
Phone: (704) 331-4943
Fax: (704) 338-7813
dharden@wcsr.com
rferguson@wcsr.com

Of Counsel:
Matthew Morrison
Peter H. Wyckoff
Pillsbury Winthrop Shaw Pittman LLP
2300 N Street, N.W.
Washington, D.C. 20037-1122

For the Defendants, the National Marine Fisheries Service, the United States Department of Commerce, Penny Pritzker, in her official capacity as Secretary of Commerce, and Roy E. Crabtree, in his official capacity as Regional Administrator, Southeast Region, National Marine Fisheries Service:

ANNE P. TOMPKINS, United States Attorney
GILL P. BECK, Assistant United States Attorney
Room 233, U.S. Courthouse
100 Otis Street
Asheville, N.C. 28801
Phone: (828) 271-4661
Email: gill.beck@usdoj.gov

SAM HIRSCH, Acting Assistant Attorney General
SETH BARSKY, Section Chief
KRISTEN L. GUSTAFSON, Assistant Section Chief

8/26/14

Date

/s/ Meredith L. Flax

Meredith L. Flax, Senior Trial Attorney (DCB 468016)
U.S. Department of Justice
Environment & Natural Resources Division
Wildlife & Marine Resources Section
Ben Franklin Station
P.O. Box 7611
Washington, D.C. 20044-7611
Phone: (202) 305-0404
Fax: (202) 305-0275
Email: meredith.flax@usdoj.gov

By signing this Order, the Court hereby GRANTS the parties' amended motion to approve the Settlement Agreement (Doc. No. 30). The original motion to approve (Doc. No. 29) is denied as moot. The Clerk is respectfully directed to CLOSE this case.

IT IS SO ORDERED.

Signed: September 2, 2014



Frank D. Whitney
Chief United States District Judge



APPENDIX A

STURGEON MONITORING FRAMEWORK

STURGEON MONITORING FRAMEWORK

Overview

This Sturgeon Monitoring Framework (“Framework”) describes four alternative monitoring measures to Reasonable and Prudent Measures (“RPMs”) numbers 3 through 5, in the National Marine Fisheries Service’s (“NMFS”) April 29, 2013 Biological Opinion (“BiOp”) for the Yadkin-Pee Dee (“YPD”) Hydroelectric Project (the “Project”) developed by NMFS with input from Duke Energy Progress, Inc. (“Duke Energy”). NMFS believes these alternative monitoring measures or “Framework” will likely produce the information it needs to fulfill the Endangered Species Act (“ESA”) requirements for monitoring take and providing triggers for reinitiation of consultation with the Federal Energy Regulatory Commission (“FERC”) under the terms of the BiOp.

The general objectives of the monitoring measures are to assess trends in shortnose and Atlantic sturgeon¹ (“sturgeon”) spawning habitat, movement, and spawning behavior in the YPD River after implementation of the flow and water quality improvements of the new license for the Project. Gathering potential spawning habitat-related information, and monitoring trends in the migration and relative abundance of sturgeon in various areas should help quantify and evaluate the quality of the additional habitat expected to be created under the new flow regime.

Telemetry tracking and side scan sonar/Didson monitoring should also help determine sturgeon movement patterns, utilization and substrate composition of newly created habitat, and general trends in the adult populations of the sturgeon species at issue.

For any or all of the studies described herein, Duke Energy may perform the activities itself, or enter into agreements with the South Carolina Department of Natural Resources (“SCDNR”), United States Geological Survey (“USGS”), contractors, or other third parties to perform the activities.

Study I (Alternative to RPM #3): A spawning and incubation habitat characterization assessment will be performed to determine the amount of suitable sturgeon spawning and

¹ This framework is based on the April 29, 2013 BiOp’s discussion of Atlantic sturgeon spawning occurring only in the spring. The BiOp discusses anecdotal information suggesting Atlantic sturgeon may spawn in the fall, or in both spring and fall, in southern rivers. New information continues to be gathered and published on studies specifically investigating the existence and extent of fall spawning by Atlantic sturgeon. Such new information may require reinitiation of consultation on the BiOp at some time in the future, and nothing in this Framework shall preclude NMFS from changing or adding monitoring requirements or other measures to the BiOp, if NMFS determines during a reinitiated consultation that the action is causing take of Atlantic sturgeon spawning in the fall. However, at present, NMFS does not believe the available information is sufficient to require reinitiation of consultation.

incubation habitat created as a result of the spring minimum flow requirements and the actual flows provided by the Project under the new license.

Study II (Alternative to RPM #4): Water quality monitoring equipment will be installed at the Jones Creek Shoal² (located between river miles (“RM”) 177.2 and 177.6, approximately 11 river miles downstream of Blewett Falls Dam (RM 188.2)) to track trends of dissolved oxygen (“DO”) and temperature at this location in the Pee Dee River.

Study III (Alternative to RPM #5): A sturgeon movement study will be performed utilizing telemetry tracking to determine where the spawning and incubation habitat in the area between the Blewett Falls Dam to Cheraw, SC (near the Highway 1 Bridge (RM 164.8)), is being utilized by sturgeon.

Study IV (Alternative to RPM #5): Sturgeon behavior and abundance monitoring will be performed using side scan and Didson sonar to assess the distribution and relative abundance of adult sturgeon in various habitat areas. These technologies will also be used to assess the composition of the habitat substrate.

Rationale

As stated in the BiOp (pg. 95), shortnose sturgeon males mature at three to five years and females mature at six to seven years in South Carolina. Males begin to spawn one to two years after reaching sexual maturity and spawn every other year and perhaps annually in some rivers. The typical age at which shortnose females first spawn is approximately 11-12 years old or about five years post-maturation. Shortnose females generally spawn about every three years, although spawning intervals may be as infrequent as every five years. In comparison, Atlantic sturgeon typically mature in South Carolina between 5 and 19 years of age and likely do not spawn every year; multiple studies have shown spawning intervals range from one to five years for males and two to five years for females.

Because of the time required for the sturgeon to mature and begin spawning, a period of eight to ten years is expected before improvements in habitat realized from the increased minimum flows and water quality enhancements from the new FERC license would be reflected in improvements in adult sturgeon populations. The first monitoring program would therefore be used to document baseline conditions resulting from the changes in operations at the Blewett Falls Hydro Station. The first 10-year monitoring program would be used to document changes that

² This shoal was identified in the Instream Flow Incremental Methodology (“IFIM”) Study as containing diverse habitats and Duke Energy believes this is the location closest to the base of Blewett Falls Dam with the greatest probability of supporting sturgeon spawning under the new license flow regime.

may occur in relation to the baseline and would provide the opportunity for up to two additional life cycles of sturgeon to reach spawning maturity. Given the current low sturgeon population estimates in the YPD River system, the proposed time interval before measurements in population trends can be considered meaningful is appropriate. However, telemetry information from the baseline monitoring period will be useful in evaluating the current adult populations' use of the enhanced spawning habitats.

The results of the baseline and the first 10-year monitoring periods will allow for inter-period spatial and temporal trending of sturgeon habitat usage. Comparisons between the baseline and the first 10-year monitoring periods will document habitat utilization by sturgeon with respect to baseline conditions. This sampling regime will provide important data in documenting sturgeon utilization patterns of any newly created habitat through such metrics as habitat occupancy by multiple individuals across multiple years, habitat occupancy under varying hydrologic conditions, and habitat occupancy by repeat spawners. Other data to be collected during the studies will yield information on preferred spawning habitats and changes in sturgeon population trends.

Study I: Spawning and Incubation Habitat Characterization Assessment

Purpose: An in-field study will be conducted to validate the Instream Flow Incremental Methodology (“IFIM”) model predicted habitat (within the application limits of the model) in the 88-mile stretch of the Pee Dee River from Blewett Falls Dam (RM 188.2) to Florence, SC, at the U.S. Highway 76/301 Bridge (RM 100.2) (see Figure 1). Based on this study, a map, complete with tables and cross-sectional views at selected transects will be developed depicting the available sturgeon spawning and incubation habitats created under the new minimum flow regime required by the new license. The quantity of habitat provided by flows above the minimum flow requirements will also be provided.

Approach: By the end of Calendar Year³ (“CY”) 2 following issuance of the new license, the existing IFIM model results and real-time streamflow data collected from the USGS gage near Rockingham, NC (USGS Gage #02129000) will be used to determine habitat availability at flows of 2,400 cfs (spring spawning period February 1 through May 15) in the portion of the Pee Dee River extending from Blewett Falls Dam (RM 188.2) to Florence, SC, at the U.S. Highway 76/301 Bridge (RM 100.2) (see Figure 1). Aerial imagery substrate mapping conducted during the IFIM Study will be reviewed and will provide habitat information to aid in selection of areas for substrate characterization. To determine whether substrate and habitat conditions are different from those predicted by the IFIM modeling effort, field reconnaissance of habitat

³ Calendar Year is defined as the first full year after receipt of the new license. For example, if the new license is issued in May 2015, Calendar Year 1 would begin on January 1, 2016, and end on December 31, 2016.

conditions will be performed during a two-month period in the spring spawning season at five discrete locations in the 88-mile IFIM Study area (Reaches 1 and 2) to observe substrate types and to measure depths and velocities under the minimum flow requirements established for the new license⁴. The field data collected will be used to validate the IFIM modeling results, taking into account the accuracy of the model under the various applications and to provide confirmation of habitat conditions and substrate composition under the new flow regime. A report of the results will be provided to NMFS by Duke Energy within 180 days of the completion of field data collection activities.

Additionally, an annual report will be provided to NMFS by Duke Energy quantifying the amount of sturgeon habitat created during the spring spawning period of each CY for the term of the new license, along with actual flow data from the Project, as measured at the USGS gage near Rockingham, NC (Gage #02129000). Habitat calculations (provided in acres) will be developed from the validated IFIM model and will utilize the mesohabitat assessment results to develop the approximate total habitat in the 88 miles of river (Reaches 1 and 2) for that year. For comparison purposes, similar calculations will be made for the amount of habitat created under the 2,400 cfs minimum flows. Taken together, the data should reveal the quantity of habitat provided by flows above the minimum flow requirements. This information will be provided in a tabular and graphical format (i.e., tables, maps with cross-sections) to show the changes as they relate to sturgeon habitat (i.e., acreage created, difference between flows). Operations under maintenance and emergency conditions, as defined by the new license, the Low Inflow Protocol (“LIP”), and periods when USGS Gage #02129000 is out of service, will not be included in the calculations; however, they will be discussed in the annual report and the duration of the specific event will be noted.

Study II: Pee Dee River Water Quality Monitoring

Purpose: Water quality monitoring will be conducted at the Jones Creek Shoal to determine the DO and temperature conditions at this location in the Pee Dee River. This water quality monitoring will provide a better understanding of the changes in DO and temperature, as well as any seasonal variations, at this location. This location has been chosen because it is easy to access and is adjacent to suspected suitable sturgeon habitat; however, it is also located outside of the water quality zone of influence of Project operations.

Approach: Duke Energy will work with USGS to install continuous water quality monitoring equipment at the Jones Creek Shoal, which is located approximately 11 miles downstream of the Blewett Falls Hydro Station (between RM 177.2 and RM 177.6, Figure 2) to measure DO and

⁴ This assumes inflow conditions are such that a sustained minimum flow release is possible for completion of the field measurements. If inflow is either too high or too low in the first two CYs, Duke Energy will request an extension from FERC for completion of this task.

temperature. Duke Energy will consult with USGS to ensure the goals and objectives of the water quality monitoring are clearly defined and will rely on USGS expertise in recommending a monitoring station location and configuration that will provide representative temperature and DO conditions for this location in the river. Prior to installation of the monitoring equipment, Duke Energy will confer with NMFS regarding the USGS monitoring station recommendation.

Continuous water quality monitoring data will be collected in a manner consistent with the methods currently used by USGS at the upstream compliance gage (USGS Gage #0212880025) for the 401 Water Quality Certification during the typically lower DO periods of the year (May through November). The monitoring equipment will be installed and operational by the end of the first full CY following FERC's issuance of a new license for the Project. Real-time data will be collected at this site in conjunction with Studies III and IV below, and will be made available to NMFS via the USGS website. Real-time data shall be considered provisional until USGS performs any corrections and conducts their Quality Assurance/Quality Control ("QA/QC") inspections. Duke Energy will provide an annual report of the data to NMFS and will include USGS calibration QA/QC records (profile data), monthly highs, lows, and averages, and will identify what the flows were during these readings for the May – November monitoring season. Special events (e.g., LIP, floods, etc.) will be identified within the report.

If USGS determines unsuitable conditions exist for establishing a real-time continuous water quality monitoring station at this location, Duke Energy will coordinate with NMFS to either choose an alternative location or implement an alternative approach (e.g., a continuous monitor such as a HOBOTM type data logger installed in conjunction with a telemetry receiver in Study III) for characterizing DO and temperature.

Study III: Sturgeon Movement Monitoring

Purpose: Monitoring sturgeon movement with telemetry techniques will be performed to improve the understanding of spring sturgeon habitat use patterns, with a focus on including a 23-mile stretch of river downstream of Blewett Falls Dam to Cheraw, SC, near the Highway 1 Bridge (RM 164.8). This river segment spans what is defined in the IFIM Study as Reach 2 (lower Piedmont area); however, the existing network of telemetry receivers will be utilized throughout the entire 88-mile stretch from Blewett Falls Dam (RM 188.2) to Florence, SC, at the U.S. Highway 76/301 Bridge (RM 100.2) (Figure 1).

Approach: Duke Energy will enlist the services of SCDNR to conduct a telemetry study to monitor the movement of adult sturgeon in coordination with other telemetry studies performed

⁵ HOBOTM data loggers are product line of Onset Computer Corporation. These data loggers or others similar to them are rugged, portable, field deployable devices capable of monitoring a specific attribute (e.g., dissolved oxygen, pH, conductivity, temperature) at a specific interval or continually during its deployed time in the field.

by SCDNR in the YPD River Basin. Year-round monitoring will occur in the 88-mile stretch of river downstream of Blewett Falls Dam (RM 188.2) to Florence, SC at the U.S. Highway 76/301 Bridge (RM 100.2) (Figure 1), with a focus on the 23-mile stretch of river from Blewett Falls Dam to Cheraw, SC near the Highway 1 Bridge (RM 164.8) (IFIM Study Reach 2, see Figure 2). The migration monitoring will be conducted by collecting and tagging adult sturgeon during April-September with internal VEMCO^{®6} acoustic transmitters. Although gravid females caught will not be tagged, males and non-gravid females may be tagged. The target numbers of sturgeon to be tagged each year for each species are described below. The initial tagging will occur yearly from CY 2 through CY 6 (five consecutive years of tagging) with each year building on the total number of tagged sturgeon in the available population.

The network of SCDNR telemetry receivers in the river reach below Blewett Falls Dam down to the Highway 1 Bridge at RM 164.8 (Reach 2, Figure 2) will be expanded with ten additional VEMCO VR2W receivers (specific locations to be determined) to assist in monitoring movement and habitat utilization by sturgeon in this reach of the YPD River, which in turn should help determine what biological functions these habitats may serve (*e.g.*, staging, spawning, etc.). This distribution of receivers assumes the continued maintenance and monitoring by SCDNR of the existing telemetry network in the YPD River, specifically those in IFIM Study Reach 1 (from Cheraw (RM 164.1) to Florence, SC at the U.S. Highway 76/301 Bridge (RM 100.2) (Figure 1)). If there are significant changes in the Reach 1 existing telemetry network (*e.g.*, modification of monitoring and maintenance intervals, removal of telemetry receivers, discontinued use, etc.), Duke Energy will coordinate with SCDNR and NMFS on the potential to reposition some of the additional ten receivers in Reach 2 to locations in Reach 1 to ensure continued monitoring coverage of the 88-mile stretch of river below Blewett Falls Dam.

Telemetry tracking will begin in CY 2 and will continue through CY 10 of the new license (nine years) to mark a sufficient number of the spawning adults and to monitor for their presence throughout the year. Duke Energy and/or SCDNR will use their best efforts to tag up to 20 of each sturgeon species (Atlantic and shortnose) with acoustic tags each year for five years, with the exception of the first two years, where up to 50 Atlantic sturgeon will be tagged each year. See Table 1 below.

Annual reports will be prepared by Duke Energy and/or SCDNR for each study year and submitted to NMFS and FERC.

⁶ VEMCO[®] is the manufacturer of fish tracking and monitoring equipment that enables researchers to study the behavior and migration patterns of marine and freshwater animals over time.

Study IV: Habitat Utilization and Abundance Trend Monitoring

Purpose: Monitoring of sturgeon behavior, sturgeon abundance trends, and the composition of associated spawning habitat substrates will be performed utilizing side scan and Didson sonar techniques. These sampling efforts will provide supplemental information that should prove useful in determining habitat usage by both tagged and untagged sturgeon.

Approach: Duke Energy will conduct side scan sonar/hydroacoustic (Didson) surveys to monitor distribution and overall abundance trends of adult sturgeon during the two peak months of spawning activity in the spring.⁷ The following four areas will be surveyed as determined by the results of the telemetry monitoring (Study III) in CYs 2-5:

- (A) the Blewett Falls tailrace area RM 188.2 (approximately 0.2 miles, Figure 2);
- (B) the Jones Creek Shoal area between RM 177.2 and RM 177.6 (approximately 0.4 miles, Figure 2) if Duke Energy determines the area is feasible for the equipment; if not, Duke Energy and NMFS will agree on an alternative location;
- (C) the area between approximately 1.2 miles above the Cashua Ferry Road/ SC Highway 34 Bridge (RM 121) and the I-95 Bridge (RM 113) (approximately 8.1 miles, Figure 1);
- (D) the area between the N. Main Street Bridge/Society Hill (RM 151) and Pee Dee telemetry receiver 31 (RM 138.5) (approximately 12.4 miles, Figure 1).

Note: It may not be feasible to utilize the side scan sonar over the full length of the areas identified above. Depending on the results of the baseline side scan sonar performed in CY 2, monitoring sites may be relocated or modified in order to acquire useful data.

Three of the four monitoring locations specified above (sites B, C and D) are located within potential sturgeon spawning areas (*e.g.*, shoals, gravel areas) in Reach 1 or 2 of the IFIM Study. The Blewett Falls Tailrace (site A) will be surveyed to determine the presence/absence of sturgeon in the tailrace. The four areas will be sonar-surveyed every two weeks during the two peak months of spawning activity in the spring as determined by the CYs 2-5 telemetry monitoring. Side scan sonar surveys will be used to locate sturgeon and the data collected will be used to estimate trends in the sturgeon usage of existing and newly-created habitat areas. The accompanying Didson system multi-beam sonar data will be used, in conjunction with the telemetry data, to verify and assess sturgeon migration patterns and overall population trends. These data, taken together, should provide additional information as to what biological functions the surveyed habitats may serve (*e.g.*, staging, spawning, etc.).

⁷ See footnote 1.

The first side scan/Didson sonar monitoring will be performed in CY 2 after receiving the new license and the results of this first round of monitoring will be used to establish the baseline conditions of the substrate in the potential habitat areas. The first round of monitoring will also be used to adjust survey locations, if necessary. The next monitoring periods will occur in CY 6, 7, 8, 9 and 10 of the new license. The survey results will be used to document habitat substrate characteristics at the potential spawning areas described above and to document the presence and behavior of sturgeon in the surveyed areas. Duke Energy will submit an annual report of the results (from CYs 2, 6, 7, 8, 9 and 10) for each study year to NMFS and FERC.

Data collected from sonar surveys in CY 2 and 6-10 (Study IV) combined with telemetry data from CY 2-10 (Study III) will be used to establish the baseline conditions that exist at the initiation of the minimum flows and enhanced water quality requirements of the new FERC license. At the end of the baseline monitoring period, Duke Energy will wait seven years and will resume a 10-year monitoring program in CY 18 (CY18-27) of the new license utilizing the same methodology outlined in Studies III and IV, with tagging and monitoring beginning in CY 18 (see Table 1).

Coordination Procedures and Actions Resulting from Analysis of Study Results

NMFS and Duke Energy agree the revised BiOp should include requirements to coordinate in ongoing evaluation of study results through annual monitoring reports during the baseline and first 10-year monitoring periods, including seeking input from other resource agency sturgeon experts as appropriate, in order to avoid the need for reinitiation of consultation if possible. Entities that NMFS and Duke Energy may coordinate with include the Resource Management Team (“RMT”) as described in the Yadkin-Pee Dee River Diadromous Fish Passage Plan Agreement.

The results from the first 10-year monitoring program will document habitat availability and occupancy by either species of sturgeon compared to baseline conditions (CYs 2-10 monitoring results). Metrics such as habitat occupancy by repeat spawners, the presence of multiple individuals across multiple years, and the various hydrologic conditions will be evaluated. In addition, information on preferred spawning habitats and changes in sturgeon population structure will also be evaluated.

At the end of the first 10-year monitoring program, NMFS will evaluate sturgeon habitat availability and occupancy patterns along with abundance trends between the baseline and first 10-year monitoring periods. If NMFS determines that sturgeon habitat utilization patterns and abundance trends between the baseline and first 10-year monitoring periods **do not** indicate a need for reinitiation of consultation, then Duke Energy will wait 10 years (i.e., no monitoring in CY 28-37) and will conduct a second 10-year monitoring period beginning in CY 38, utilizing the

same methodology outlined in Studies III and IV (with tagging and telemetry beginning in CY 38). If NMFS determines that sturgeon habitat availability and occupancy patterns along with abundance trends between the baseline and first 10-year monitoring periods **do** indicate a need for reinitiation of consultation, NMFS will confer with FERC and Duke Energy to assess what factors may be contributing to the lack of success in enhancing sturgeon habitat utilization and improving population trends for either sturgeon species. Those factors determined by NMFS, in consultation with Duke Energy and FERC, to be related to Project operations will be evaluated during reinitiation of consultation to determine if any corrective actions need to be implemented.

Additionally, NMFS, Duke Energy and the RMT will develop coordination procedures that may provide for early identification of study results of concern (i.e., earlier than the end of the first 10-year monitoring period) and that may avoid the need for reinitiation of consultation.

NMFS will evaluate the results from Studies III and IV to determine if increasing numbers of either species of sturgeon are exhibiting extended durations of occupancy in the tailrace along with lack of utilization of downstream newly created habitat. If the information indicates a need for reinitiation, NMFS will confer with Duke Energy and FERC to discuss potential actions. One action that may be considered during the reinitiation of consultation would be an upstream and downstream fish passage evaluation, to be conducted by Duke Energy in coordination with NMFS and the RMT, to determine if proven, safe, effective and economically feasible options exist for upstream and downstream passage of that sturgeon species at Blewett Falls Dam.

Table 1. Sturgeon Monitoring Timeline (Baseline and First 10-Year Monitoring Periods)

Target Number of Tags Applied	CY	Task		
	1	-	-	-
20 SNS ⁸ + 50 AS ⁹	2	Tag	Telemetry	Side Scan
20 SNS + 50 AS	3	Tag	Telemetry	
20 SNS + 20 AS	4	Tag	Telemetry	
20 SNS + 20 AS	5	Tag	Telemetry	
20 SNS + 20 AS	6	Tag	Telemetry	Side Scan
	7	-	Telemetry	Side Scan
	8	-	Telemetry	Side Scan
	9	-	Telemetry	Side Scan
	10	-	Telemetry	Side Scan

⁸ SNS - shortnose sturgeon

⁹ AS - Atlantic sturgeon

	11	wait		
	12	wait		
	13	wait		
	14	wait		
	15	wait		
	16	wait		
	17	wait		
20 SNS + 50 AS	18	Tag	Telemetry	
20 SNS + 50 AS	19	Tag	Telemetry	
20 SNS + 20 AS	20	Tag	Telemetry	
20 SNS + 20 AS	21	Tag	Telemetry	
20 SNS + 20 AS	22	Tag	Telemetry	
	23	-	Telemetry	Side Scan
	24	-	Telemetry	Side Scan
	25	-	Telemetry	Side Scan
	26	-	Telemetry	Side Scan
	27	-	Telemetry	Side Scan

Figure 1: Pee Dee River from Blewett Falls Dam (RM 188.2) to Florence, SC at the U.S. Highway 76/301 Bridge (RM 100.2)

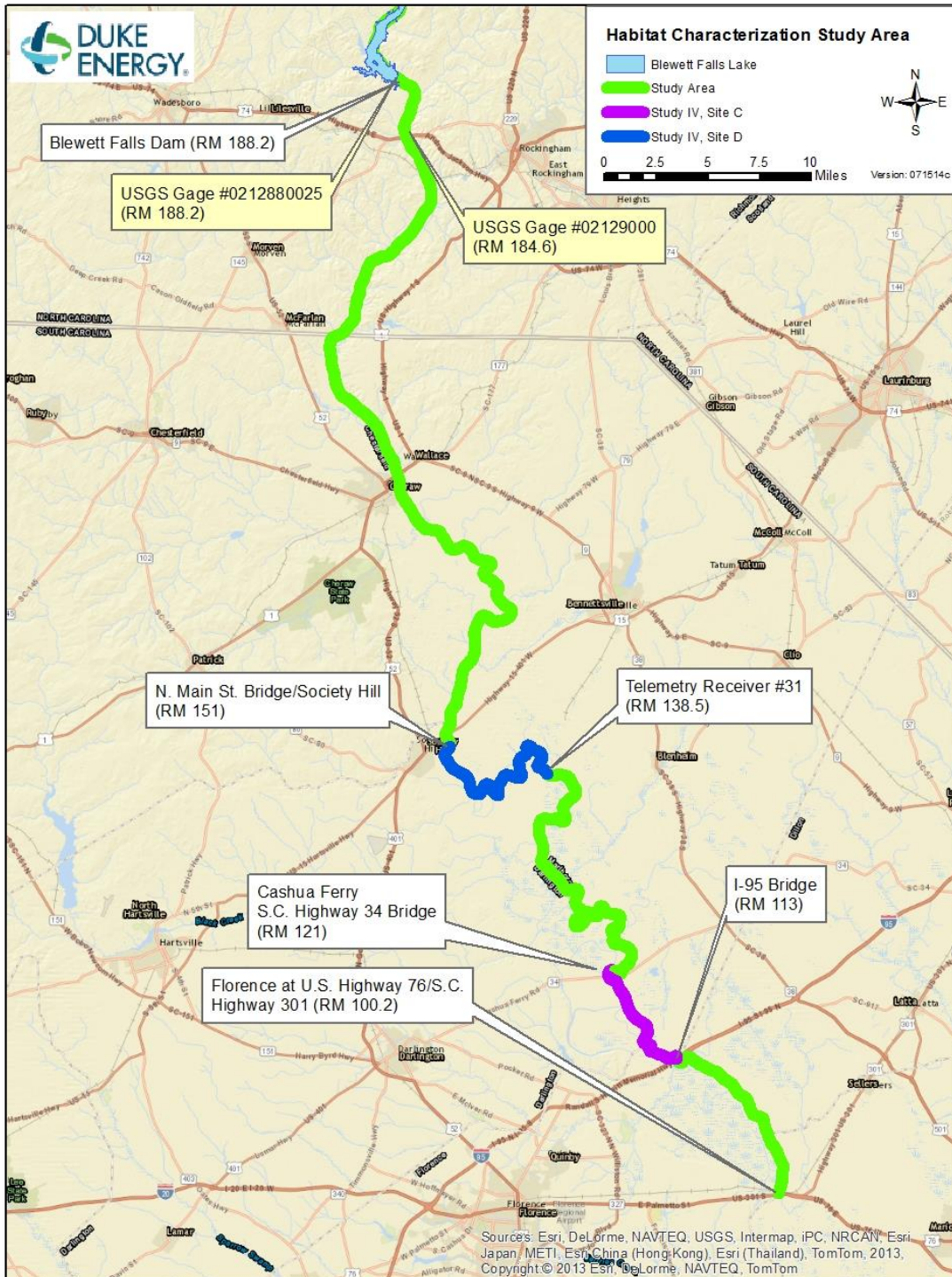


Figure 2: Sturgeon Receiver Locations in Reach 2 of IFIM Study Area (proposal to add up to 10 additional receivers between the two existing receivers shown here)

