FINAL REPORT

South Carolina State Wildlife Grant F22AF03590

South Carolina Department of Natural Resources

Grant Reporting Period: 10/1/22 – 9/30/23

Project Title: High Resolution Acoustic Telemetry Array in the Edisto and Savannah Rivers.

Principle Investigators: William C. Post and Ellen Waldrop, SCDNR MRD

Summary: A recently completed multi-year telemetry study funded by the National Marine Fisheries Service focused solely on sturgeon movements in coastal rivers in North Carolina, South Carolina, and Georgia and reinforced findings from previous sturgeon studies (Post et al. 2014). It also discovered two previously undocumented behaviors—Atlantic Sturgeon making inland movements indicative of spawning behavior in the fall, and Shortnose Sturgeon using the Atlantic Ocean to migrate between river basins. Additionally, many sturgeon transmitted by other researchers coast-wide continued to be detected having active transmitters at the conclusion of the study.

Because active transmitters remained in many sturgeon, the decision was made to maintain South Carolina's receiver array through an alternative funding source, this State Wildlife Grant. This would allow for continued collection of long-term detection data for any transmitted sturgeon, and any other transmitted animals, until transmitter batteries expired. Recognizing the amount of manpower and funding required to maintain full coverage of the ~300 receivers remaining from the previous multi-state research effort, the decision was made to concentrate on areas within the existing array that no longer received funding or support. Therefore, two river basins were selected as focus areas of the continued project, the ACE Basin (specifically the Edisto River), and the Savannah River (specifically upriver of Interstate Hwy 95).

Elements of the arrays in these systems remained intact, however, due to equipment failure, vandalism, storms, and so on, many receivers that were part of the original array in those areas were missing. In some cases, malfunctioning receivers can be refurbished, but usually a complete replacement is needed. Additionally, many transmitters now have the capability of transmitting a signal for up to 10 years and the average life expectancy of a receiver is only 5 to 6 years.

Objectives: The project had two main objective which were as follows:

Objective 1

An array of 12 Innovasea (formerly Vemco) VR2W data-logging receivers remained deployed in the Edisto River from river kilometer (rkm) 0 to 166. This represented 54% coverage of the original array deployed in 2011. The goal of this objective was to replace and maintain up to 13 missing receivers in the Edisto River. All detection data for any State Wildlife Action Plan (SWAP) transmitted animals would be shared in conjunction with both East Coast cooperative telemetry networks (FACT Network and the Atlantic Cooperative Telemetry (ACT) Network), to distribute transmitter detection data to participating researchers.

Objective 2

An array of 12 Innovasea VR2W data-logging receivers remained deployed in the Savannah River, upriver of I-95 (rkm 44 to 301). This represents 40% of the original array coverage deployed in 2011.

The goal of this objective was to replace and maintain up to 22 missing receivers in the Savannah River (between I-95 and Augusta, GA). All detection data for any SWAP transmitted animals would be shared in conjunction with both cooperative telemetry networks (FACT and ACT), to distribute transmitter detection data to participating researchers.

Accomplishments:

Objective 1.
All receivers were purchased and distributed as necessary to fill any gaps within the Edisto River array (Figure 1). Some receivers were not deployed and held back in the office to replace any future receiver loss in these areas. Each deployed receiver was tethered in mid-water column and attached to a stainless-steel cable, high tensile rope, or chain which is anchored to the bottom. These riggings are supported by a buoy and attached again to surface or shoreline structures (dock piling, bridge, tree, etc.), which has proven effective in past studies. Researchers maintained any downloaded detection in telemetry databases and used Innovasea's VUE and Fathom software to keep track of receivers, transmitted sturgeon, and movement data. Several field trips to download and clean receivers and inspect riggings were performed after initial deployment. All downloaded data is maintained by SCDNR and was shared with both cooperative tagging networks (FACT and ACT). Species detected as of the date of this submission were Atlantic Sturgeon (*Acipenser oxyrinchus*) and Shortnose Sturgeon (*Acipenser brevirostrum*), both SWAP species of highest concern and both federally endangered.

Objective 2.
All receivers were purchased and distributed as necessary to fill any gaps within the Savannah River array (Figure 2). Some receivers were not deployed and held back in the office to replace any future receiver loss in these areas. Each deployed receiver was tethered in mid-water column and attached to a stainless-steel cable, high tensile rope, or chain which is anchored to the bottom. These riggings are supported by a buoy and attached again to surface or shoreline structures (dock piling, bridge, tree, etc.), which has proven effective in past studies. Researchers maintained any downloaded detection in telemetry databases and used Innovasea's VUE and Fathom software to keep track of receivers, transmitted sturgeon, and movement data. Several field trips to download and clean receivers and inspect riggings were performed after initial deployment. All downloaded data is maintained by SCDNR and was shared with both cooperative tagging networks (FACT and ACT). Species detected as of the date of this submission were Atlantic Sturgeon (*Acipenser oxyrinchus*) and Shortnose Sturgeon (*Acipenser brevirostrum*).

Significant deviations: There were no deviations or unforeseen issues.

Literature Cited:

Post, W.C., T. Darden, D.L. Peterson, M. Loeffler, and C. Collier. 2014. Research and management of endangered and threatened species in the Southeast: riverine movements of shortnose and Atlantic sturgeon. Final Report to NMFS #NA10NMF4720036. 274pp.

South Carolina Department of Natural Resources (SCDNR). 2015. South Carolina State Wildlife Action Plan and Supplemental Volume. Columbia, South Carolina. <http://www.dnr.sc.gov/swap/>. Accessed 12/6/2024.

SC-T-F22AF03590 Final Report

Estimated Federal Cost: $87,500

Recommendations: Close the grant.

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Signed: William C Post

Signed: Ellen Waldrop

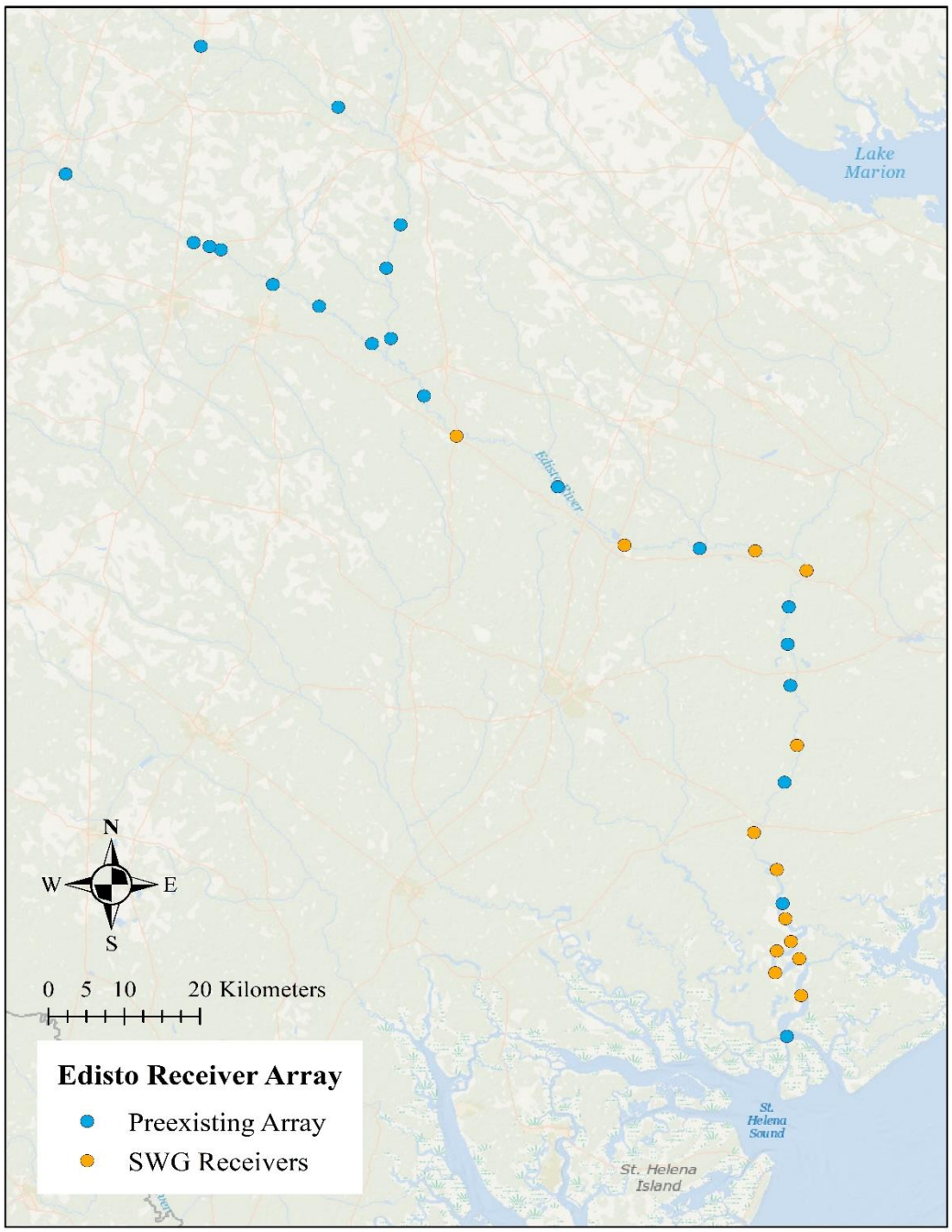

Figure 1. Current Edisto River acoustic receiver array, including receivers provided by this funding.

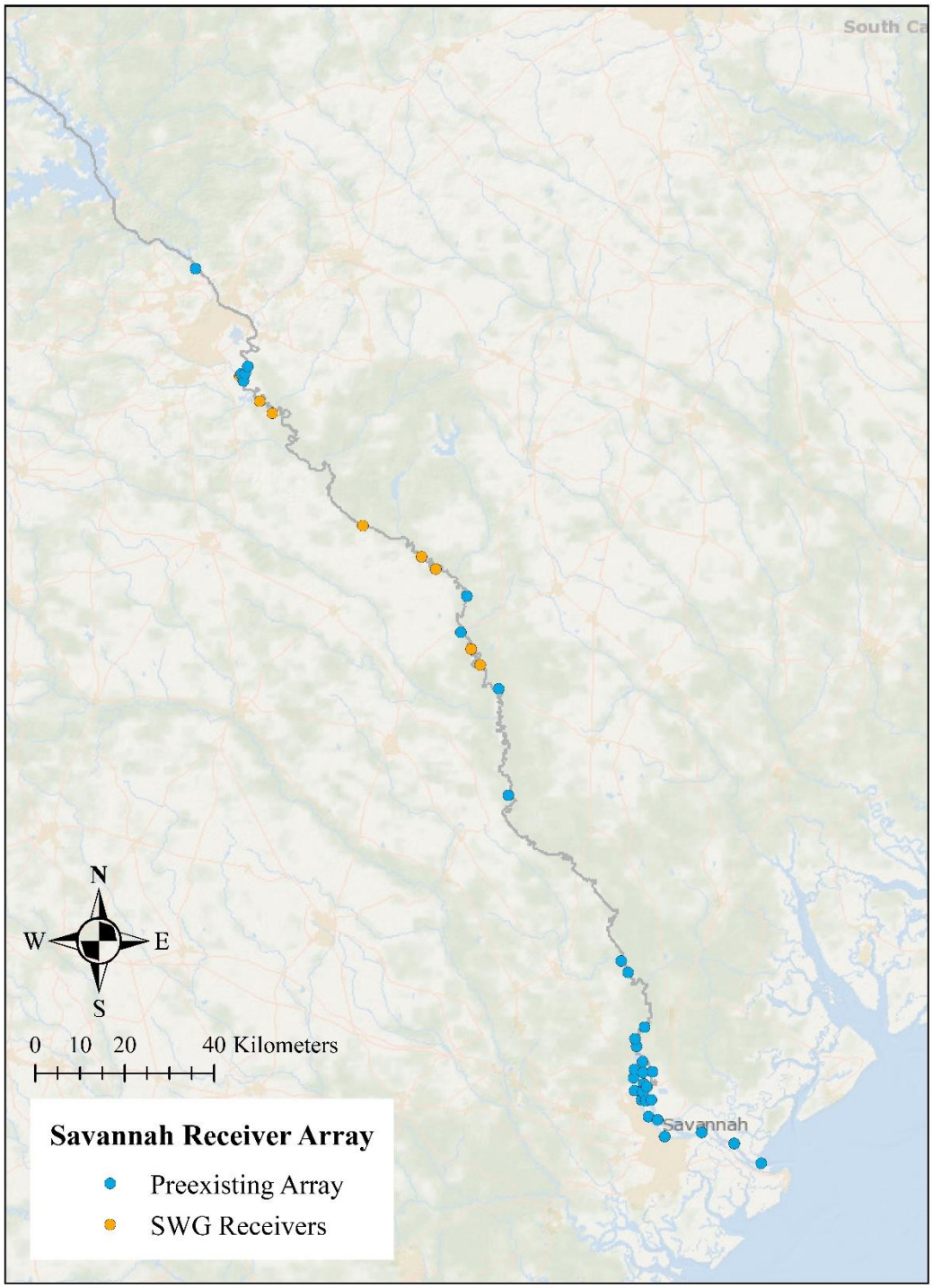

Figure 2. Current Savannah River acoustic receiver array, including receivers provided by this funding.