

**Request For Proposal
Santee Accord Technical Committee**

DATE of ANNOUNCEMENT: 22 June 2023

Purpose: The Santee Accord Technical Committee (SATC) is accepting proposals to evaluate American Shad (*Alosa sapidissima*) restoration in the Santee-Cooper River basin using genetic parentage analysis. This Request for Proposals (RFP) is provided for a fair evaluation for all applicants and to provide the applicants with the evaluation criteria against which they will be judged.

Background: The Santee Basin Cooperative Accord (Accord) is a collaborative approach among the hydroelectric utilities including Dominion Energy, which acquired South Carolina Electric & Gas in 2019, and Duke Energy, as well as state and federal natural resource agencies including South Carolina Department of Natural Resources (SCDNR), North Carolina Wildlife Resources Commission (NCWRC), and the U.S. Fish and Wildlife Service (USFWS) to address diadromous fish interests within the Santee-Cooper River basin. The Accord allows members to focus efforts on the highest priority areas with the greatest potential for successful results, rather than addressing issues piecemeal based on project relicensing schedules.

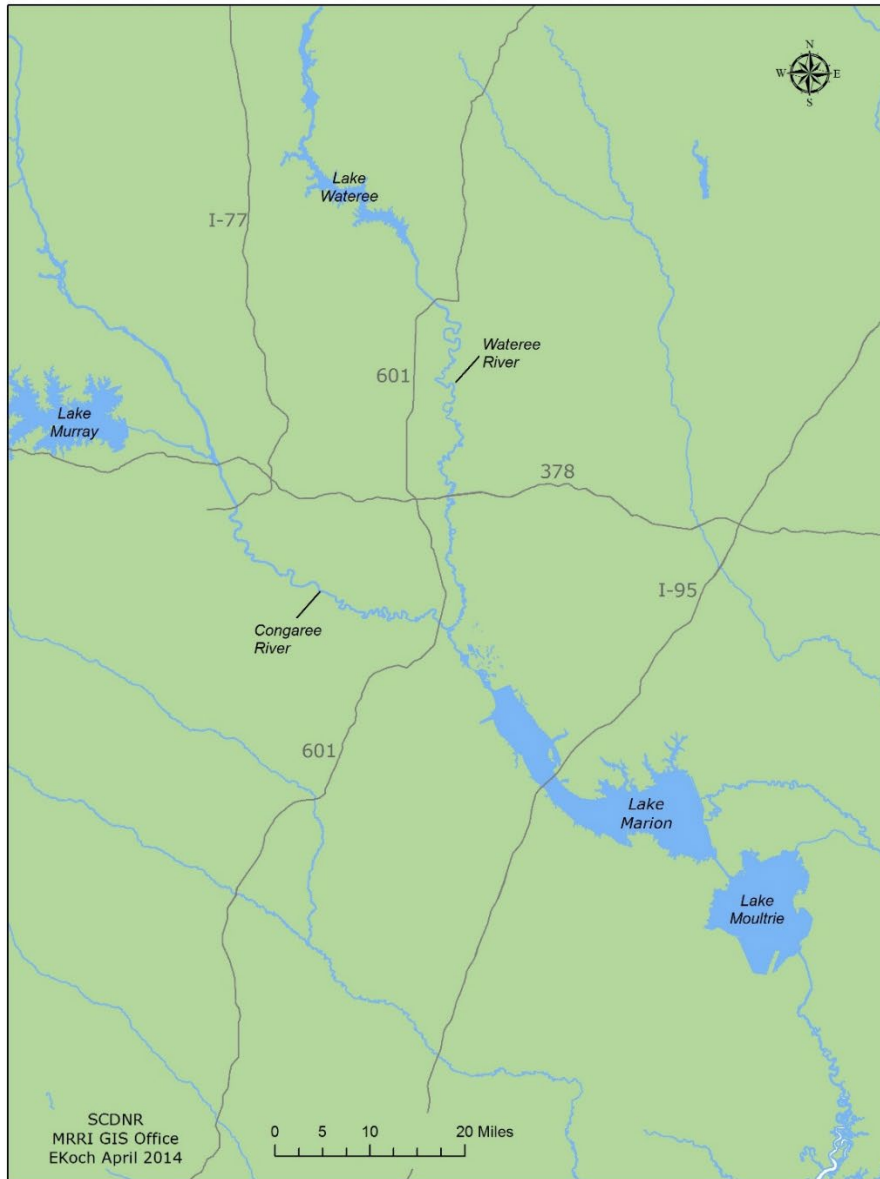
The agencies (USFWS, SCDNR, and NCWRC) have statutory obligations to protect, enhance, and restore populations of diadromous fish. In 2001, the agencies submitted a plan to the Federal Energy Regulatory Commission for the restoration of diadromous fish populations in the Santee-Cooper River basin (USFWS et al. 2001), and the plan was accepted as a comprehensive management plan under Section 10(a)(2)(a) of the Federal Power Act. The plan provides a framework for rebuilding populations of the Santee Basin's diadromous fish through (1) water quality improvements, (2) enhanced instream flows, (3) habitat protection, and (4) the restoration of access to former spawning and maturation sites. The plan envisioned a partnership approach to restoration that recognizes the responsibilities, mandates, and capabilities of private sector and governmental agencies that manage and use the public-owned resources involved. This initial restoration plan was developed with the intention that it would be modified and expanded as greater knowledge of the Basin, its fisheries, and its resources were gained, and the agencies revised the plan (NMFS et al. 2017).

The Santee Basin Cooperative Accord 10-Year Action Plan for the Restoration and Enhancement of Diadromous Fish in the Santee Basin identifies ten areas of potential American Shad restoration. One of these is stocking of American Shad fry in the Wateree and Broad Rivers. This action item will potentially enhance young-of-year (YOY) abundance in those areas and "imprint" shad so they may return to the stocking locations and spawn as adults. American Shad fry are produced using wild-caught Santee-Cooper River basin broodstock that are allowed to spawn volitionally (no hormone injections) in recirculating tanks at multiple hatcheries throughout South Carolina. A small number of fry were stocked in 2008, but the

stocking program began in earnest during 2009. Nearly 73 million fry were stocked into the basin during annual stockings between 2008 and 2022 (Table 1). Approximately 75% were stocked in the Broad River and 25% were stocked in the Wateree River. Adult American Shad are collected in the Upper Santee River, Congaree River, Wateree River, and Broad River, while broodfish are collected in the re-diversion canal at St. Stephens. YOY American Shad relative abundance is monitored at multiple locations in the Santee River basin from June–November each year.

Hatchery evaluation using microsatellite markers for parentage-based tagging analysis has proven effective for American Shad (Julian and Bartron, 2007; Cushman et al. 2012; and Hasselman et al. 2013). Previous attempts to evaluate the Santee-Cooper River basin American Shad stocking program, however, have been unsuccessful in providing conclusive results (Quattro 2016; Evans et al. 2017). Refinements to hatchery protocols and genetic tissue storage procedures made since the initial examinations should be sufficient for another attempt at evaluating the contribution of stocked American Shad in the Santee-Cooper River basin. Since 2017, tissue samples (e.g., fin clips or flesh punches) have been collected from all broodfish, adults sampled in upriver habitats, and all YOY collected from the lower river sampling sites to evaluate hatchery or wild origin using genetic parentage analysis.

Geographic Scope: Santee-Cooper River Basin



Objective: Evaluate the success of the Santee-Cooper River basin American Shad stocking program from 2017 through 2023 using genetic parentage analysis. Specifically, the analysis should indicate the percentage of stocked fish in the broodstock, sub-samples of YOY collected throughout the basin, and returning adults collected in upriver locations. Previous genetic work has selected, optimized, and utilized a microsatellite panel of loci for American Shad (Julian and Bartron, 2007; Cushman et al. 2012; and Hasselman et al. 2013). It is the recommendation of the SATC that genetic parentage analysis be performed using this suite of previously identified microsatellite markers, and hatchery contribution should be investigated by comparing samples to available broodstock using Program CERVUS. All tissue samples are currently preserved in ethyl alcohol or sarkosyl urea, in the possession of SCDNR, and will be delivered to the selected applicant. Parentage evaluation of up to 9,446 tissue samples shall be included in the analysis

(Table 2). In addition, the proposed analysis should include an evaluation of temporal genetic diversity within and between wild fish and broodfish.

Deliverables: Due to previous issues with poor DNA amplification, the selected applicant will provide a brief progress report of DNA amplification results from a random sample of approximately 200 tissue samples by 30 days from the beginning of the contract. Upon successful results from the initial analysis, quarterly progress reports will be submitted, and a draft final report will be due to the SATC on or before 30 August 2024. A final report will be provided to the Santee Accord Management Board (SAMB) board on or before 31 December 2024. A presentation will be provided in the fall of 2024 at the SAMB annual meeting (to be announced, but normally between September and November). The final report shall contain the results of genetic parentage analysis to assess the contribution of hatchery reared American Shad to the 2017–2022 year classes in the Santee-Cooper River basin. The report will also provide an explanation of all statistical analysis used to assess the confidence in parentage assignments. Raw data of genotypes and hatchery identification for all analyzed samples shall be provided in a spreadsheet or other database. Extracted DNA should be archived using industry standard techniques such as DNA cards. Archived DNA and unused tissue samples shall be returned to SCDNR at the conclusion of the project.

Proposal guidelines and requirements: This is a competitive bid process. Proposals received after 12:00pm/noon EST, 30 days from announcement of the RFP will not be considered. The proposal must contain a timeline with anticipated dates of completion for project milestones (e.g., receive samples, DNA amplification test, parentage analysis, draft report, etc.). The proposal must contain the applicant’s qualifications to undertake this project and demonstrate the applicant has successfully completed similar projects. Professional references are to be included in the proposal. The proposal must contain the signature of a duly authorized officer or agent of the organization submitting the proposal. The quoted price should be inclusive. If the quote excludes certain fees or charges, a detailed list of excluded fees with a complete explanation of the nature of those fees should be included.

This project seeks to maximize the information gained from the 9,446 tissue samples but recognizes that some applicants lack the ability to process all the samples and deliver a final product by the stated deadline. As such, each applicant must include in their submission a brief statement of work that clearly defines how many samples will be processed, analyzed, and reported on within the prescribed timeframe. It is acceptable for the applicant to work with a subset of the available samples, but they must include the proposed numbers of each sample type as defined in Table 2 by life stage and year. A rationale for the numbers and types of tissues selected for subsampling should also accompany the statement of work. If use of a

subset of samples is preferable, the selection of samples to be analyzed will occur in consultation with the SATC.

The use of sub-contractors in the execution of work to be performed by the applicant must be clearly stated in the proposal. Sub-contractors must be identified with name, address, and EIN, and the work they will perform must be defined. The SATC will not refuse a proposal based upon the use of sub-contractors; however, we retain the right to refuse the sub-contractors selected by the applicant. If the SATC rejects the proposed subcontractors, the applicant will be notified and allowed to modify the proposal, including costs, to include sub-contractors acceptable to the SATC.

Budget: Please provide a fixed price budget and schedule for completing the work. The budget should include all costs associated with analyzing samples and report(s) preparation. The estimated maximum number of tissue samples to be analyzed is 9,446 samples (Table 2); however, the budget should also provide a cost per sample breakdown that specifies pricing at various levels of samples if the SATC decides to further subsample available tissue samples.

Contract terms: The SATC will negotiate contract terms, excluding cost, upon selection. All contracts are subject to review by the SAMB, and the project will be awarded upon signing of an agreement or contract, which outlines terms, scope, budget and other necessary items. The SATC and SAMB reserve the right to reject proposals and terminate the project at any point based on availability of Accord funding.

Evaluation criteria: The following criteria will form the basis upon which the SATC will evaluate proposals:

- Proposal received no later than 12:00pm/noon EST, 30 days from announcement of the RFP.
- Proposal includes a detailed budget as described above. All costs associated with the delivery of the project should be presented in a fixed rate, fee for service format.
- Proposal includes detailed schedule capable of meeting the deadline.
- Proposal meets the needs and criteria set forth in the RFP.
- Applicant has successfully completed similar projects and has the qualifications necessary to undertake this project.
- Proposal includes qualifications and references of the applicant.
- Price is commensurate with the value offered by the applicant.
- Proposal is well organized and presented in a clear, logical manner.

Deliver proposals to the attention of: Jeremy McCargo, jeremy.mccargo@ncwildlife.org

Literature Cited

- Cushman, E., C. Tarpey, B. Post, K. Ware, and T. Darden. 2012. Genetic characterization of American Shad in the Edisto River, South Carolina, and initial evaluation of an experimental stocking program. *Transactions of the American Fisheries Society* 141:1338-1348
- Evans, H. K., K. B. Carlson, and J. Aiyeku. 2017. Precentage-based tagging for 2015 Santee River basin American Shad. Final Report to the Santee Technical Accord Committee. 9 pp.
- Hasselman, J., D. Ricard, and P. Bentzen. 2013. Genetic diversity and differentiation in wide ranging anadromous fish, American Shad (*Alosa sapidissima*), is correlated with latitude. *Molecular Biology* 22:1558-1573.
- Julian, S. E., and M. L. Bartron. 2007. Microsatellite DNA markers for American Shad (*Alosa sapidissima*) and cross-species amplification within the family Clupeidae. *Molecular Biology* 7:805-807.
- National Marine Fisheries Service (NMFS), North Carolina Wildlife Resources Commission (NCWRC), South Carolina Department of Natural Resources (SCDNR), and U. S. Fish and Wildlife Service (USFWS). 2017. Santee Basin Diadromous Fish Restoration Plan. 84 pp.
- Quattro, J. M. 2016. Relative contributions of hatchery derived individuals to the Santee-Cooper River basin American Shad (*Alosa sapidissima*) population. A draft report submitted to the Santee Accord Technical Committee. 18 pp.
- U. S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and South Carolina Department of Natural Resources (SCDNR). 2001. Santee-Cooper Basin Diadromous Fish Passage Restoration Plan. 48 pp.

Table 1. American Shad fry stocked in the Santee River basin, 2008–2022.

Year	Broad River	Wateree River	Lake Moultrie	Total
2008	24,000			24,000
2009	439,625	364,340		803,965
2010	2,543,218	824,927		3,368,145
2011	1,162,032	500,800		1,662,832
2012	1,025,808	334,302		1,360,110
2013	2,178,508	730,825		2,909,333
2014	2,565,516	877,485		3,443,001
2015	3,203,261	1,080,424		4,283,685
2016	3,328,107	1,058,900		4,387,007
2017	2,441,735	1,352,184		3,793,919
2018	3,899,996	1,327,558		5,227,554
2019	5,910,131	1,971,549		7,881,680
2020	9,114,047	3,897,155	12,737	13,023,939
2021	9,029,465	3,081,916		12,111,381
2022	6,303,544	2,116,592		8,420,136
Total	53,168,993	19,518,957	12,737	72,700,687

Table 2. American Shad tissue samples available for genetic parentage analysis, 2017–2023.

Year	Broodfish	Adults	Juveniles ⁺	Total
2017	572	140	812	1,524
2018	750	129	919	1,798
2019	696	20	642	1,358
2020	498	23	653	1,174
2021	531	86	866	1,483
2022	583	93	833	1,509
2023*	500	100	–	600
Total	4,130	591	4,725	9,446

⁺Juvenile samples have been sub-sampled to include a maximum of 200 tissue samples per sample location each year.

*Anticipated totals for broodfish and adults to be collected in spring 2023.