Environmental Studies Program: Ongoing Study

Title	Understanding of Atlantic Sturgeon Migratory Patterns – Integrating Telemetry and Genetics (AT-19-06)
Administered by	Office of Renewable Energy Programs
BOEM Contact(s)	Ursula Howson (Ursula.howson@boem.gov)
Procurement Type(s)	Cooperative Agreement; Inter-agency Agreement
Conducting Organization(s)	University of Delaware and USGS
Total BOEM Cost	$395,357 (UD); $240,478 (USGS)
Performance Period	FY 2020–2023
Final Report Due	June, 2023
Date Revised	March 23, 2022
PICOC Summary	
Problem	BOEM authorized projects may impact ESA-listed Atlantic sturgeon. Information regarding the origin of Atlantic sturgeon on the Atlantic OCS will aid in consultations under the ESA.
Intervention	This study would synthesize existing telemetry data with genetic assignments (e.g., distinct population segments and river of origin).
Comparison	Existing data treat all five DPSs equally.
Outcome	The outcome will be a better understanding of Atlantic sturgeon distinct population segments that may be impacted by BOEM activities.
Context	BOEM has learned about Atlantic sturgeon habitat in the Northeast and Mid-Atlantic Planning Areas through investments in telemetry arrays. The next step is to better understand where the sturgeon that are found offshore come from via genetic analysis.

BOEM Information Need(s): This information is necessary for BOEM's Office of Renewable Energy Programs and Marine Minerals Program to meet its obligations under the National Environmental Policy Act, and the Endangered Species Act. BOEM ESA consultations currently assume that BOEM-approved projects affect all five Atlantic sturgeon Distinct Population Segments (DPS) equally in the marine mixing zone along the entire Atlantic coast. Understanding the genetics of the telemetered fish will enable BOEM and NMFS to better understand the DPSs that are affected and improve ESA consultations.

Background: Atlantic sturgeon are managed as five DPSs but commonly occur in mixed aggregations in the offshore marine environment. The extent of mixing within the five Distinct Population Segments (DPS) within the marine mixing zone is not well understood. The mixing and coastal migration patterns may not be uniform because sturgeon return to the natal spawning rivers at different times (Balazik and Musick 2015). Thus, the impacts of BOEM authorized projects, such as offshore wind energy development, would be expected to differ among DPSs across space and time. A better understanding of when and where each DPS of Atlantic sturgeon occurs will allow BOEM and NMFS to characterize, reduce, and mitigate risks based on the status of each DPS rather than all DPSs equally in the marine

mixing zone. Since 2015 BOEM has invested in fish telemetry projects from the New York Bight to Virginia with an emphasis on capturing seasonal offshore migration of Atlantic sturgeon. This effort has yielded a lot of information about seasonal movement of Atlantic sturgeon, but it has only been a partial picture without the genetic assignment. BOEM also entered into an inter-agency agreement with USGS (NT-15-x12) to develop a genetic library from Atlantic sturgeon obtained as part of BOEM-funded studies. This interagency agreement is now working to pilot the genetic work proposed in this study profile.

Objectives:

- Leverage existing telemetry data combined with ongoing genetic research to provide detailed estimates of Atlantic sturgeon occurrence and migration patterns.

- Assign river of origin (DPS) based on genetic analysis of telemetered sturgeon.

Methods: This project would use existing acoustic telemetry data compiled for Atlantic sturgeon from the Atlantic Cooperative Telemetry (ACT) Network and federally funded projects. Genetic assignment data will be generated by USGS using the latest baseline for the species, leveraging existing genotype data (874 telemetered individuals) and additional samples collected for this study. Synthesizing this information, DPS-specific migration maps will be generated showing the seasonal patterns of Atlantic sturgeon occupancy along the Atlantic coast. Spatial and temporal occurrence data from the telemetry data would be divided by DPS and life-history stage. This information would then be compared to the location of proposed offshore wind energy projects to help characterize relative risk of projects to different DPSs and life history stages of Atlantic sturgeon.

Specific Research Question(s): What is the relative risk of offshore wind energy projects to specific Atlantic sturgeon DPSs and life history stages?

Current Status: A kick-off meeting was held on August 19, 2020. Processing samples from researchers throughout the region and data analysis is underway.

Publications Completed: None

Affiliated WWW Sites: None

References:

Balazik MT, Musick JA. 2015. Dual annual spawning races in Atlantic sturgeon. PLoS ONE. 10(5): e0128234. https://doi.org/10.1371/journal.pone.0128234