Environmental Studies Program: Studies Development Plan | FY 2022–2023

Title	Sturgeon Response to Dredge Activities and Recovery After Trawl Capture Near Outer Continental Shelf (OCS) Sand Resources (MM-22-02)
Administered by	Marine Minerals Program
BOEM Contact(s)	Deena Hansen (Deena.Hansen@boem.gov)
Procurement Type(s)	Inter-agency Agreement
Conducting Organization(s)	NOAA Fisheries
Total BOEM Cost	TBD
Performance Period	FY 2022–2025
Final Report Due	TBD
Date Revised	April 22, 2021
PICOC Summary	
Problem	Sturgeon, which are listed under the Endangered Species Act (ESA), rely on the habitat associated with OCS sand resources. Potential direct impacts to sub-adult and adult sturgeon from dredging and relocation trawling are neither well documented nor well understood.
Intervention	Implement parallel Atlantic and Gulf field studies to observe behaviors in high-risk areas that propose dredging when Atlantic/Gulf sturgeon may be present and trawling is proposed.
Comparison	Investigate sturgeon behavior in non-dredge years relative to dredge years. Observe condition following trawl capture and behavior upon release. Compare Atlantic and Gulf sturgeon post-trawl behavior characteristics.
Outcome	Improved understanding and assessment of impacts to Atlantic sturgeon, which may influence lease decisions and mitigation measures
Context	Sand resources on the Atlantic and Gulf OCS in waters <50 m deep

BOEM Information Need(s): Activities associated with BOEM leases for OCS sediment resources, like dredging and relocation trawling, may overlap with the ESA-listed Atlantic and Gulf sturgeon. An improved understanding of these interactions could help BOEM and resource agencies improve sturgeon conservation, inform and improve leasing decisions, and refine mitigation measures. Information on the dredge-induced response and relocation trawl recovery would strengthen impact analyses used in National Environmental Policy Act (NEPA) and ESA consultations. BOEM's leases, executed by the Marine Minerals Program (MMP), would then incorporate improved mitigation measures.

Background: Direct entrainment of sturgeon during dredging has been documented in navigation dredging and has occasionally been documented on the OCS (e.g., Gulf sturgeon lethally taken in the Mississippi Coastal Improvement Program [MsCIP]). Additionally, relocation trawling is a common mitigation measure initially implemented to capture and relocate sea turtles to avoid dredge entrainment. Trawling is sometimes used to primarily relocate sturgeon (e.g., South Atlantic Regional

Biological Opinion). Though a common mitigation requirement, the effects of this disruption to sturgeon are poorly understood.

Sturgeon regularly occur on and near BOEM-leased borrow areas both in the Atlantic and Gulf regions, though no critical habitat has been designated in these areas. Relocation trawling, a mitigation measure to move protected species away from sand dredging in a BOEM lease area off Carteret County, NC, captured and released 34 individual Atlantic sturgeon over three seasons. In the Gulf of Mexico, the U.S. Army Corps of Engineers is executing a comprehensive monitoring of Gulf sturgeon, since sturgeon were found associating with bathymetric features offshore of the MsCIP Barrier Island Restoration project (USACE 2013).

Through cooperative efforts within the MMP and the Office of Renewable Energy Programs (OREP), Atlantic sturgeon have been tracked on active lease areas: Sandbridge shoal, VA (ongoing study NSL# AT-15-01) and Canaveral Shoals, FL (ongoing study NSL# NT-14-x12). Off Long Island, NY, an area of potential sediment leasing interest, Atlantic sturgeon were tracked near a Wind Energy Area; some of the highest frequencies of occurrence and residence events were at shallower depths along a proposed cable route (BOEM 2019-074; Frisk et al., 2019). While some regional models predict Atlantic sturgeon occur in water depths where dredging could occur, as well as in active or historic lease areas (Breece et al. 2017), fine-scale behavior near sand resources needs investigation. In addition to these ongoing efforts, other BOEM studies have focused on tracking sturgeon via telemetry (e.g., BOEM_2019-074, BOEM_2020-020) and can be used to complement the proposed study.

Objectives:

1. Characterize Atlantic and Gulf sturgeon behavior before, during, and after dredging.
2. Estimate recovery following relocation via trawl.
3. Determine the condition of captured sturgeon in parallel field studies in the Atlantic and Gulf regions.

Methods: To achieve the three major objectives, methods include:

- Analyze previous captures of Atlantic and Gulf sturgeon in relocation trawls from BOEM, USACE, and other stakeholder records to determine factors (e.g., oceanographic or physical) that may contribute to trawl capture and condition upon release.
- Use acoustic tags to track Atlantic and Gulf sturgeon residency around sand features among years; observe behavior when dredging occurs (e.g., approach, avoidance, foraging changes, etc.).
- Measure body condition (e.g., via Fulton's condition factor), response to stimuli, and physiological indicators (e.g., blood hormone levels) of captured sturgeon to determine fitness and level of stress.
- Use fine-scale tags like accelerometers or pop-up satellite archival tags (e.g., Erickson et al., 2011) to track sturgeon immediately after relocation trawl release to observe greater detail of the type and duration of behavioral changes, including potential mortality.

Specific Research Question(s):

1. What is the occurrence and residency time around sand resources, both during dredging and without dredging?

2. What conditions, both physical and physiological, are sturgeon in when captured by relocation trawl?
3. How do sturgeon behave after being relocated, and what are the differences in behavior between Atlantic and Gulf sturgeon? How does this behavior differ from other observed behaviors?
4. Where do sturgeon move after relocation, relative to dredging activity (e.g., attraction, avoidance)?

Current Status: N/A

Publications Completed: N/A

Affiliated WWW Sites: N/A

References:

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Erickson DL et al. 2011. Use of pop-up satellite archival tags to identify oceanic-migratory patterns for adult Atlantic Sturgeon, Acipenser oxyrinchus oxyrinchus Mitchell, 1815. J Appl Ichthyol. 27: 356–365.

Frisk MG, Ingram EC, Dunton K. 2019. Monitoring endangered Atlantic sturgeon and commercial finfish habitat use in the New York Lease Area. Stoney Brook (NY): US Department of the Interior, Bureau of Ocean Energy Management. 88 p. OCS Study BOEM 2019-074.

USACE. 2013. EL monitoring program provides valuable insights for disparaged fish. US Army Corps of Engineers, Engineer Research and Development Center (ERDC) Website. Published 02 December 2013. Accessed 30 March 2021. https://www.erdc.usace.army.mil/Library/Article/476594/el-monitoring-program-provides-valuable-insights-for-disparaged-fish/