

## **Environmental Studies Program: Ongoing Studies**

**Study Areas:** Mid-Atlantic

**Administered By:** Office of Renewable Energy Programs

**Title:** Endangered Atlantic Sturgeon Habitat Use in Mid-Atlantic Wind Energy Area

**BOEM Information Need to be Addressed:** Atlantic sturgeon were listed under the auspices of the Endangered Species Act in 2012. Limited information shows that Atlantic sturgeon occupy offshore waters (marine zone) up to at least 40m in depth during the winter. However, there is little data regarding their seasonal patterns of distribution and abundance in and around the proposed offshore wind energy areas (WEAs) and sand borrow sites. 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, the Endangered Species Act, and the Magnuson-Stevens Fishery Conservation and Management Act. Baseline data on Atlantic sturgeon, and other important protected and commercially important finfish that have been implanted with acoustic transmitters, will allow their seasonal presence/absence, habitat use, and any migration corridors to be identified and used to inform environmental impact assessments for offshore renewable energy as well as for marine minerals. Atlantic sturgeon could potentially be negatively impacted by offshore wind energy development through noise disturbance and displacement from feeding grounds, masking of their communication calls, and disruption of their migration pathways, as well as through changes to their benthic prey species.

**Conducting Organization:** U.S. Naval Facilities Engineering Command, Atlantic

**Total Cost:** \$620,000

**Period of Performance:** FY 2015–2020

### **Description:**

**Background:** Atlantic sturgeon experienced severe declines due to habitat destruction and overfishing beginning in the late 19th century. Lack of recovery coupled with concerns over continued loss/degradation of habitat, ship strikes, and bycatch in commercial fisheries resulted in NOAA-NMFS listing five Distinct Population Segments under provisions of the Endangered Species Act in 2012 (NOAA-NMFS 2012). The Mid-Atlantic, which includes the James River, Delaware River, and the Hudson River, historically supported the largest populations of Atlantic sturgeon (Secor and Waldman 1999). However, presence in the offshore environment is not well understood. While there is a growing body of information on the riverine habitat requirements for this species, information on their marine habitats is severely lacking (Dunton et al. 2010, Erickson et al. 2011). This lack of information on marine habitat use is of particular concern given the fact that Atlantic sturgeon spend the vast majority (>90%) of their adult lives in the coastal and offshore waters and are completely dependent on this region for food resources. Atlantic sturgeon are a large (max weight > 400kg) and highly mobile species, as a result they are not commonly encountered in traditional gillnet or trawl surveys due to issues surrounding gear selectivity (Dunton et al 2010).

Telemetry is therefore a much more effective technique for understanding the seasonal presence, habitat use and movement pathways of sturgeon.

**Objectives:** The objective of this study is to provide information on the seasonal patterns of occurrence and habitat use as well as explore the underlying causal mechanisms for Atlantic sturgeon habitat selection in and around the Virginia WEA and the Sandbridge Shoal sand borrow site in BOEM's Mid-Atlantic Planning Area.

**Methods:** The approach would be to leverage large numbers (>900 at present) of telemetered Atlantic sturgeon in the Mid-Atlantic, which have been tagged through a number of research programs and form part of the Atlantic Cooperative Telemetry Network and supplement these tags with animals caught in the offshore habitat. Existing studies with acoustic receivers have primarily been in freshwater, estuarine, and nearshore (<8km) marine habitats. Consequently, very little is known about their offshore marine habitats and feeding grounds, and how these may overlap with the proposed WEAs, sand borrow areas, and adjacent nearshore areas. The approach will provide a robust estimate of Atlantic sturgeon distribution and habitat use in the WEAs and sand borrow areas in the mid-Atlantic. This study will:

1. Determine the seasonal presence/absence of endangered Atlantic sturgeon in and around the project areas in the mid-Atlantic.
2. Characterize the habitat use (including habitat type including biological and physical characteristics) and feeding grounds of Atlantic sturgeon to the extent practicable with available data.

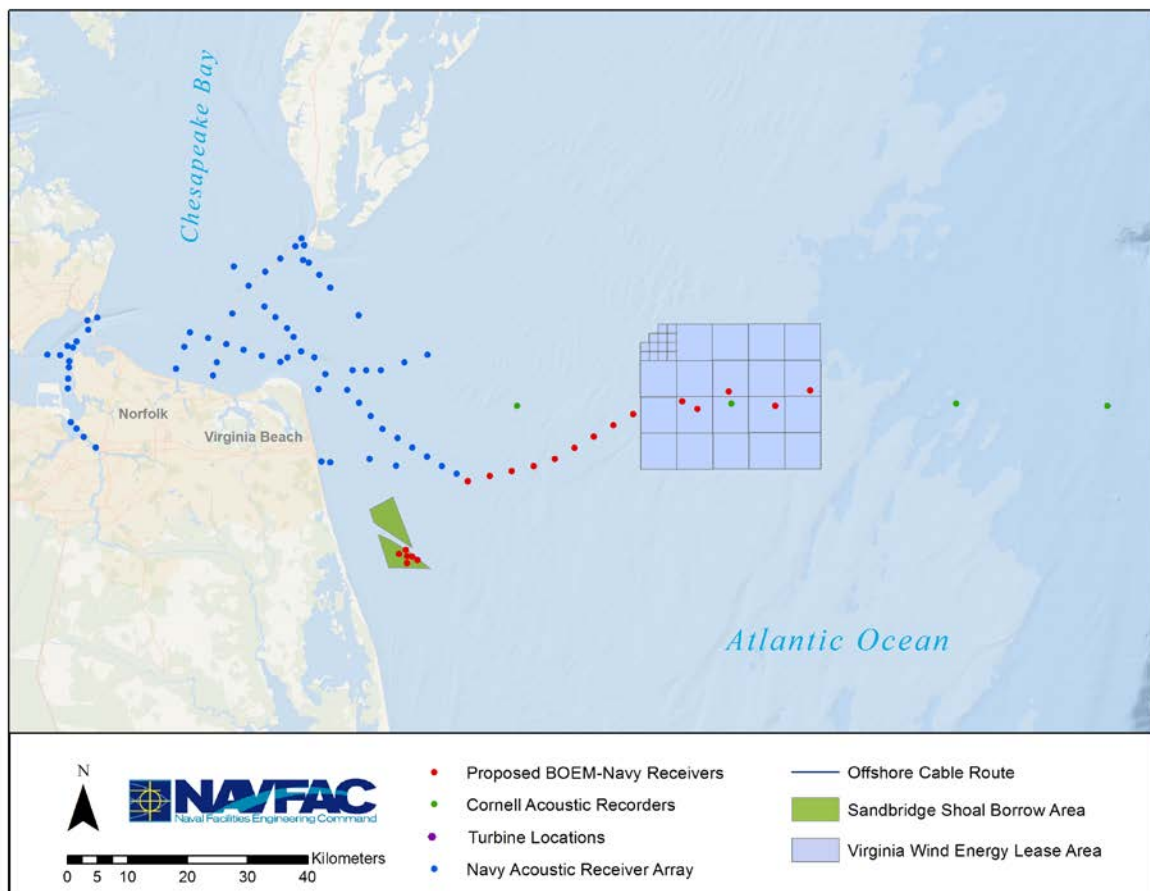
The first three years of the study would be focused on field work and data collection. The fourth and fifth year will include data synthesis and interpretation with the possibility of continued field work. The project is proposed to take a total of five years subject to the availability of funding. Atlantic sturgeon will be implanted with long-life acoustic transmitters to provide a minimum 4 years of baseline information on their occurrence, distribution, and movements with the potential to increase funding to continue to collect tag information beyond initial 3-4 years of data collection. Through the Atlantic Cooperative Telemetry Network, previous efforts will be leveraged representing >900 telemetered Atlantic sturgeon at present, allowing inferences to be made about species' offshore distribution and habitat use. Acoustic transmitters, in addition to those already deployed, may be purchased to track fish that may be caught through either incidental or directed catch effort in the offshore study area. In order to develop seasonal models of presence/absence in mid-Atlantic project areas, a combination of fixed and mobile platforms may be used. Passive acoustic receivers would be anchored within each project area at variable intervals dependent upon seafloor features and distance from shore. Data from the fixed arrays may be supplemented with mobile surveys conducted by Autonomous Underwater Vehicles (AUVs) which may also be used to retrieve data from fixed receivers reducing the amount of times receivers need to be retrieved for data download.

Habitat data are available from previous survey work by the National Oceanic and Atmospheric Administration's Office of the Coast Survey (NOAA/OCS) in 2007, 2012,

and 2013. Supplementary data is also available from surveys in support of offshore wind development as part of the Virginia Offshore Wind Technology Assessment Project (VOWTAP). Real-time satellite data streams (Ocean color and sea surface temperature) would be provided through the Federal Integrated Ocean Observatory System (IOOS) to provide the broad scale environmental context for understanding sturgeon distribution. This, along with the separate genetic analysis project of any captured sturgeon, provides a much more integrated means of identifying habitat associations between sturgeon and the dynamic marine environment.

The results of this project can be used to inform environmental impact assessments and biological assessments for offshore wind energy and marine minerals.

Figure 1. Placement of passive acoustic telemetry receivers.



**Current Status:** The project kick-off meeting was held on October 7, 2015. Receiver deployment was completed in spring 2016. The study is proceeding well with several species being identified and coordinated through data sharing networks such as the Atlantic Cooperative Telemetry Network. Over 627 individual sturgeon, 133 striped bass, 55 sand tiger sharks, and 105 other species of fish were detected during in 2016. Preliminary results of the work were shared at the American Fisheries Society annual meeting in 2017.

**Final Report Due:** July, 2020

**Publications:**

Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.J. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. *Fishery Bulletin* 108:450-465.

Erickson, D. L., A. Kahnle, M. J. Millard, E. A. Mora, M. Bryja, A. Higgs, J. Mohler, M. DuFour, G. Kenney, J. Sweka, and E. K. Pikitch. 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.

Secor, D.H. and J.R. Waldman. 1999. Historical abundance of Delaware Bay Atlantic sturgeon and potential rate of recovery. pp. 203-217. In: J.A. Musick [Ed.], *Life in the Slow Lane: Ecology and Conservation of Long-Lived Marine Animals*. Amer. Fish. Soc. Symp. 23, Washington, DC.

**Affiliated Web Sites:** None

**Revised Date:** January 25, 2018