September 1, 2016

Kimberly B. Damon-Randall
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Protected Resources Division
NMFS, Greater Atlantic Regional Office
55 Great Republic Drive
Gloucester, MA 01930

Re: Docket No. 150818735-6236-01, Endangered and Threatened Species; Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon

Ms. Damon-Randall:

The Delaware Riverkeeper Network (DRN) submits this comment letter in response to the National Marine Fisheries Service's (NMFS) public notice for comment on Docket No. 150818735-6236-01, Endangered and Threatened Species; Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon. In preparing this comment, DRN enlisted the help of Atlantic sturgeon expert Matthew Fisher; Mr. Fisher reviewed the proposed critical habitat designation and provided his expert opinion on the proposed rule. The Delaware Riverkeeper Network agrees with his findings and submits Dr. Fisher's analysis as a part of our comment on the proposed critical habitat. Specifically, Mr. Fisher found that the best available science demonstrates that NMFS's proposed critical habitat for the Delaware River is correct, and that Delaware Bay and parts of

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the nearshore marine environment should also be included as critical habitat for the Atlantic sturgeon.

The Delaware Riverkeeper Network champions the rights of our communities to a Delaware River and tributary streams that are free-flowing, clean, healthy, and abundant with a diversity of life. The Delaware Riverkeeper has long been active in supporting designation of the Delaware River population of Atlantic Sturgeon as endangered, and brought legal action to ensure prioritization by NMFS for the preparation of release of this critical habitat designation proposal.

The Atlantic sturgeon has a storied history in the Delaware River watershed. This prehistoric fish was once an important resource for local Native American tribes, with the Delaware River supporting the largest population of Atlantic Sturgeon in North America. Atlantic sturgeon are a vital part of the River's ecosystem – past, present, and future.

NMFS estimates that historically there were around 180,000 spawning females in the Delaware River population of Atlantic Sturgeon. As a result, the Delaware River gained the title of "caviar capital of North America". Seventy five percent of the 1890-1899 sturgeon harvest originated in the watershed and approximately 3,189,555 pounds of sturgeon were harvested over the course of just five years in the 1890's. (Cobb, J. The Sturgeon Fishery of the Delaware River and Bay, Report of Commissioner of Fish and Fisheries (1899).) This frenzied over-harvesting quickly led to a drastic collapse of the River's Atlantic Sturgeon population.

Habitat loss from dredging, blasting, and other deepening activities; saltwater intrusion; water pollution and poor water quality; the loss of river bottom habitat needed for spawning from coverage of silt from the coal industry; impingement and entrainment; boat and propeller strikes; and fisheries bycatch have all contributed to the Atlantic sturgeon's continued decline and

inability to recover from the historic overharvesting. As a result of these devastating and ongoing impacts it is estimated that there are less than 300 spawning adults left in the Delaware River population of Atlantic sturgeon. By some estimates there may be as few as 87 adults spawning annually in the Delaware River. (NOAA Fisheries Presentation on Atlantic Sturgeon Listing Under the Endangered Species Act (April 25, 2012).)

All of the above-mentioned harms and threats continue, and some have worsened, with new threats emerging regularly. As a result, a critical habitat designation that covers all parts of the Delaware River watershed and nearshore marine environment, and that is supportive of Atlantic Sturgeon's habitat and life cycle needs, is vital for this species' survival and recovery.

The New York Bight Distinct Population Segment (DPS) is unique among Atlantic sturgeon, and the Delaware River Atlantic sturgeon are unique among the New York Bight. The Delaware River population of Atlantic sturgeon contains a genetically distinct haplotype unique to the Delaware River. (NMFS, Status Review of Atlantic Sturgeon, p.27 (Sept. 1998).) Unfortunately, this unique population is also in the worst shape; despite a decades-long moratorium on fishing, the population has been largely unable to recover because of the myriad of harmful activities and circumstances discussed above.

The Delaware Riverkeeper Network recognizes the importance of protecting this ancient species, and has been intimately involved in its listing and the development of critical habitat. In October of 2010, DRN submitted comments on NMFS's recommendation for endangered status, and in April and June of 2012 DRN wrote NMFS emphasizing the need to establish critical habitat and to protect the Atlantic sturgeon from the harms of the Delaware deepening project. In March of 2014 DRN filed suit against NMFS in order to secure the prioritized establishment of critical habitat for Atlantic Sturgeon.

DRN fully supports NMFS's finding that Atlantic sturgeon critical habitat includes the Delaware River from the Route 1 Toll Bridge in Trenton downstream 137 river kilometers to Hope Creek, NJ. This portion of the river is vital to the Atlantic sturgeon's recovery as it functions as both spawning grounds for Atlantic Sturgeon and as a migration corridor to and from the Atlantic sturgeon's spawning grounds. This section of the Delaware Estuary contains the hard substrate, low salinity, and proper spring and fall temperatures necessary for successful spawning. This section of River is also under past, present and increasing pressures harmful to Atlantic Sturgeon – including, but not limited to, advancement of the River's salt line caused by human activities which reduces the geographic scope of the spawning grounds available, dredging, in-river development, increased and ongoing pollution inputs, ship strikes and more. Critical habitat designation is therefore vital for protecting this critically important reach of River for the Atlantic Sturgeon.

However, DRN does not support the exclusion of the Delaware Bay and nearby marine waters, as these areas also act as critical habitat for the Atlantic sturgeon. The presence of Atlantic sturgeon in the Delaware Bay and nearby marine waters is well documented (as discussed in further detail below, and in the attached expert comment), these areas contain features essential to the Atlantic sturgeon's conservation, and require special protection. Therefore, the Delaware Bay and nearshore ocean are also in need of critical habitat designation. Additionally, because of the precariousness of this species, NMFS should err on the side of caution and include the Delaware Bay and nearby marine waters as critical habitat.

Erring on the side of caution is particularly important because of the increasing threats to the survival of the New York Bight and the Delaware River portion of the New York Bight DPS. The Delaware Deepening project includes dredging and blasting of vital habitat, will require

subsequent maintenance dredging and will allow for more frequent and larger cargo ships to disturb the entire course of the Atlantic sturgeon's migration to its spawning grounds. Ship strikes already account for a substantial portion of sturgeon deaths, and these will likely increase as larger, more frequent cargo ships scrape the bottom of the Estuary, where Atlantic sturgeon are known to dwell. If Atlantic sturgeon are able to successfully run the gamut that is the shipping channel, they face yet another boat-related threat: the strong possibility they will end up as bycatch. 414 Atlantic sturgeon were reported as bycatch in the Delaware Bay alone between the years of 1999 and 2011, and it is estimated the total number is likely around 1789. (Matthew Fisher, State of Delaware Compliance Report for Atlantic Sturgeon (Sept. 2013).) In fact, the vast majority of all reported Atlantic sturgeon bycatch occurred in the Delaware Bay, as opposed to the River or Atlantic Ocean. Further illuminating this immense threat, NMFS has estimated that there is a thirty eight percent intercept rate for Atlantic sturgeon in Northeast fisheries, and an average mortality rate of twenty percent of those caught in sink gillnets. (NOAA Fisheries Presentation on Distribution of Fishing Effort and Sturgeon Takes, Ad Hoc Atlantic Sturgeon Committee (Mar. 19, 2012).)

A similar scenario is unfolding in the other natal river of the New York Bight, the Hudson River, where the Tappan Zee Bridge project is likely responsible for the deaths of over one hundred endangered sturgeon.

In addition, ongoing and increasing pollution discharges; new development projects that require filling in portions of the River and Bay waters and the installation of pilings and associated activities; increasing ship traffic that creates an increased opportunity for accidents, incidents, and pollution spills; port expansion projects and proposals to reduce existing protections for Delaware Estuary and Bay waters demand that the Bay and nearby marine waters

also be given critical habitat designation. An inclusive critical habitat is necessary to ensure the survival of Atlantic sturgeon in light of the continued and increasing threats faced by the New York Bight.

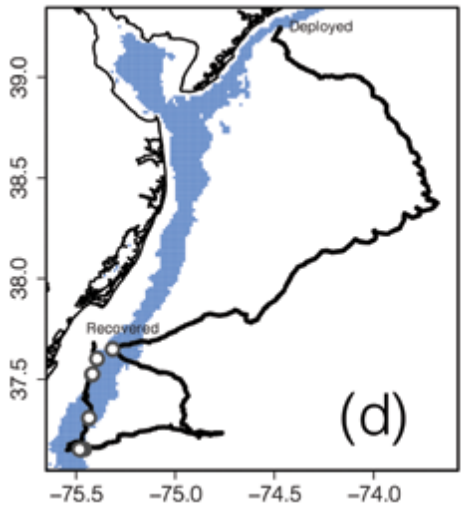
While we support NMFS's decision to include 137 river kilometers of the Delaware River as proposed critical habitat, the Agency must include the Delaware Bay and nearshore marine waters.

Atlantic Sturgeon are Present in the Delaware Bay and Nearshore Marine Waters.

NMFS correctly states that Atlantic sturgeon are present from the mouth of the Delaware Bay to the head-of-tide at the fall line near Trenton on the New Jersey side, and Morrisville on the Pennsylvania side of the Delaware River, a distance of 220 river kilometers. (81 FR 35706 citing Shirey *et al.,* 1997; Brundage and O'Herron, 2007; Simpson, 2008; Calvo *et al.,* 2010; Fisher, 2011; Breece *et al.,* 2013.) NMFS is also correct in its conclusion that Atlantic sturgeon must be present "downstream" of their farthest known upstream location. (81 FR 35707.) It is common sense that in order for Atlantic sturgeon to reach the Delaware River, they must first migrate through the Bay. This is particularly true for the Delaware Bay as it is unique among sturgeon habitat, being a small bay with a narrow entrance.

Atlantic sturgeon are known to frequent the Delaware Bay. (Oliver *et al.,* Shrinking the Hay Stack: Using an AUV in an Integrated Ocean Observatory to Map Atlantic Sturgeon in the Coastal Ocean, 212-213 (2013).) Adult male Atlantic sturgeon likely reside in the lower part of the Delaware estuary after the spring spawn, and either migrate out of the lower estuary via the Delaware Bay in the fall, or move further up the estuary to participate in a fall spawn. (81 FR 35704.) Spawning females must also migrate through the Bay to reach their spawning grounds.

Juvenile Atlantic sturgeon are present in the Bay and nearshore marine waters, and have been known to migrate from the lower tidal river to the lower Bay and nearshore ocean in the fall, areas in which they likely "overwinter". (Brundage and O'Herron, Investigations of juvenile shortnose and Atlantic sturgeons in the lower tidal Delaware River (2009) citing Brundage and Meadows, 1982b; Lazzari *et al*., 1986; Shirey *et al*., 1997.) It is during this migration to the near shore ocean and lower Bay that the majority of sturgeon death via bycatch occurs. (Oliver *et al*., citing Stein *et al*. 2004b)). Atlantic sturgeon observed in Oliver *et al.*'s study showed an affinity for the water mass tied to the Delaware Bay; this area includes the Bay itself, and nearshore marine waters (Oliver *et al.* at 215, Figure 3d at 214.)



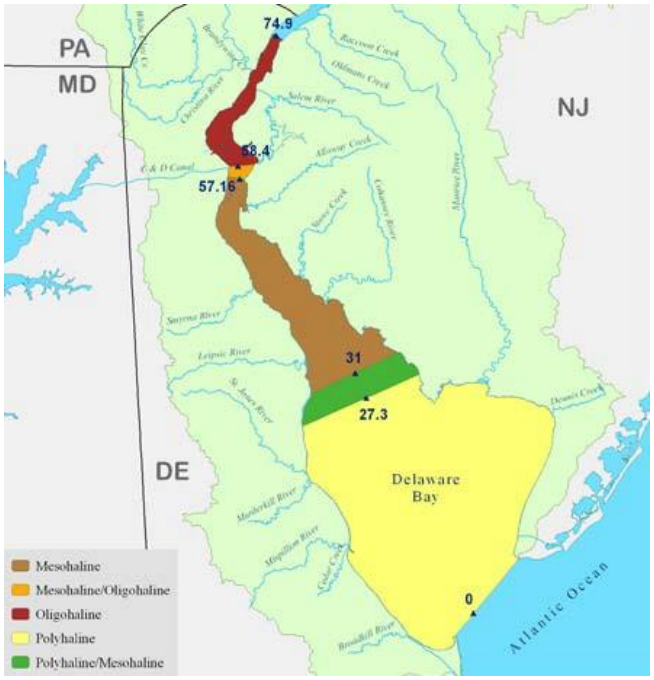
The unique water mass (blue) in which Atlantic Sturgeon were detected. (Oliver *et al.* 214, Figure 3d.)

The Delaware Bay and Nearshore Marine Areas Contain Features Essential to Conservation, and Require Special Management Considerations and Protections.

Salinity and Bottom Substrate

Juvenile Atlantic sturgeon are often found in both mesohaline (water with a salinity of 5-18 parts per thousand, or ppt) and polyhaline waters (waters with a salinity of 18-30 ppt); while

subadults and adults prefer polyhaline waters. (81 FR 35703, 35706 citing Brundage and Meadows, 1982; Lazzari *et al.*, 1986; Shirey *et al.*, 1997; Shirey *et al.*, 1999; Simpson, 2008; Brundage and O'Herron, 2009; Calvo *et al.*, 2010; Fisher, 2011.) The Delaware Bay is polyhaline at its mouth and mesohaline at the Northwest extent of the Bay. (Wilson, Bottom Sediment Mapping of the New Jersey Central Delaware Bay Oyster Beds (Sept. 2006), citing USACE 1997.) The Delaware Bay is a well-mixed estuary, and Atlantic sturgeon prefer this type of habitat. (Oliver *et al.* 215.)



Map showing salinity zones in the Delaware Estuary. Created by Kreeger, et al. from salinity readings obtained from the Delaware River and Bay Commission. (Delaware Estuary Benthic Inventory (DEBI) - An exploration of what lies beneath the Delaware Bay and River. pp. 71 at 21.)

Atlantic sturgeon also rely on the presence of soft substrates, as this environment provides necessary benthic prey. (81 FR 35712.) Atlantic sturgeon are opportunistic benthic foragers, and all of the prey identified by studies of Atlantic sturgeon's stomach contents are

found in soft substrates. (Dzaugis, Diet and Prey Availability of Sturgeons in the Penobscot River, Maine (2013); Johnson *et al.*, Food Habits of Atlantic Sturgeon off the Central New Jersey Coast (1997).) The Delaware Bay is dominated by sand and silt, with the occasional clay bottom; all of which are considered "soft". (Wilson, Bottom Sediment Mapping of the New Jersey Central Delaware Bay Oyster Beds (Sept. 2006).) Grab samples of the bottom substrate of the Bay indicate that the vast majority of the Bay's substrate is considered "soft" and therefore hospitable to benthic prey and foraging. (Wilson and Madsen, Investigation and Review of the Surface and Sub-Surface Sediment Distribution of Reach E for the Delaware River and Bay Main Channel Deepening Project (2011).) The Bay's soft substrates provide ample benthic foraging opportunities for juvenile, subadult, and adult sturgeon, and therefore the Bay contains physical and biological characteristics essential to conservation. These prime habitat conditions extend beyond the Bay, into the nearshore marine waters mapped by Oliver *et al*. and found on page 7 herein.

Connectivity

"Essential features" can also be expressed in terms of principles of conservation biology, and needn't necessarily be physical features such as soft or hard substrate. (50 CFR 424.02.) The Delaware Bay contains essential features under the principle of connectivity, as the Bay is vital for the Atlantic sturgeon's migration to and from its spawning grounds and also enables gene flow between distinct sturgeon populations. (Dunton *et al.*, Genetic mixed-stock analysis of Atlantic sturgeon Acipenser oxyrinchus oxyrinchus in a heavily exploited marine habitat indicates the need for routine genetic monitoring (2012).) Atlantic sturgeon cannot reach their spawning grounds without passing through the Bay, and physically cannot migrate to the ocean

or other overwintering areas without first swimming through the Bay. In the draft critical habitat, NMFS recognizes the need for "open passage" to and from spawning grounds, but inexplicably NMFS' critical habitat proposal fails to ensure open passage through the Delaware Bay. (81 FR 35712.) Open passage can only be guaranteed by including the Delaware Bay as critical habitat, and therefore critical habitat must be extended to include the entire Delaware Bay and nearby marine waters.

Special Management Protections

All of the harms and threats outlined in this comment are present in the Bay and nearshore marine environment, with dredging-related activities, vessel strikes, development pressures, ongoing and increasing pollution inputs, increased opportunity for pollution accidents, incidents and spills, and bycatch being exacerbated in these areas. Larger and more frequent tanker passages resulting in vessel strikes, dredging and subsequent maintenance dredging, and bycatch will occur with more frequency in the Bay, and are present through the entire course of the proposed critical habitat.

Conclusion

NMFS has correctly identified the need to increase the survival of subadult and adult Atlantic sturgeon, and protection of the Bay and nearshore marine environment will help protect this subset of the species. The overwintering areas and migration corridors of juveniles, subadults, and adults must be protected. Without the protection of the Bay and nearshore environment, foraging and migrating Atlantic sturgeon will continue to be subject to the myriad

of threats that have and continue to inflict harm on this incredibly endangered species postured on the brink, critical habitat will be incomplete, and survival of the species will be less likely. As demonstrated above and in the attached comment created by Atlantic sturgeon expert Matthew Fisher, these areas qualify for critical habitat protection in addition to the Delaware River. For these reasons, critical habitat should be extended beyond the "mouth" of the Delaware River and include the Bay and nearshore marine environment.

DRN appreciates this opportunity to comment on the proposed critical habitat for the Atlantic sturgeon, and to bring to the Agency's attention the need to protect this valuable species as it migrates through the Delaware Bay on its way to its spawning grounds and while overwintering in nearshore marine waters.

Respectfully Submitted,

Maya K. van Rossum

/s Corinne Bell

Maya K. van Rossum
the Delaware Riverkeeper

Corinne Bell
Staff Attorney

Attachment: *Fisher, Matthew; Expert Report on the Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon.*

Expert Report on the Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon

Prepared for:

Delaware Riverkeeper Network

Bristol, PA

Prepared by:

Matthew Fisher, Aquatic Resource Solutions

Townsend, DE

August 28, 2016

Introduction:

Matthew Fisher of Aquatic Resource Solutions reviewed the Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon by the National Marine Fisheries Service (NMFS) and the accompanying Draft Biological Information and ESA Section 4(b)(2) Source Document with the Draft Economic Analysis and Initial Regulatory Flexibility Analysis. The following review addresses the appropriateness of the Atlantic sturgeon habitat designated for the Delaware Estuary in the New York Bight DPS. While the draft economic analysis was reviewed the results are not discussed by this reviewer as it is not within this expert's area of expertise.

Biological information (Federal Register page 35703-35705)

The physical features described for all life stages of Atlantic sturgeon for successful reproduction and recruitment; hard bottom substrate, salinity gradient, depth, absent of physical barriers, water quality are all appropriate for Atlantic sturgeon in tidal waters.

Geographical area (Federal Register page 35707)

The term "geographical area occupied by the species" is defined as an area that may generally be delineated around a species' occurrences, as determined by the Secretary (i.e., range). Such areas may include those areas used throughout all or part of the species' life cycle, even if not used on a regular basis (e.g., migratory corridors, seasonal habitats, and habitats used periodically, but not solely by vagrant individuals) (50 CFR § 424.02).

Physical and Biological Features Essential to Conservation that may Require Special Management Considerations or Protections

Federal register page 35707-35708; "Critical habitat is defined as those specific areas in the geographical area occupied that (1) have the physical or biological features essential to the conservation of the listed

entity, and (2) may require special management considerations or protections. Each of these two prongs must be met when designating critical habitat within the occupied geographical area."

Delaware River: Critical habitat has been proposed from the Delaware River at the crossing of the Trenton Morrisville Route 1 Toll Bridge, downstream for 137 river kilometers to where the main stem river discharges at its mouth into Delaware Bay. Based on captures, carcass reports and telemetry studies of juveniles, subadults and adults, this area is geographically appropriate for designation of critical habitat for Atlantic sturgeon. The requirement of special management considerations and protections needed in this area is met by: water quality limiting growth of juveniles, vessel strike mortality of subadults and adults, impingement and entrainment mortality, sedimentation of hard bottom spawning habitat, water withdrawals decreasing freshwater spawning and juvenile habitat, new and/or ongoing proposals for development within the river, proposed pollution discharges, by-catch and dredging activities.

Delaware Bay and Marine: As outlined below, certain areas of the Delaware Bay and nearshore marine areas should be included as critical habitat for Atlantic sturgeon. Based on telemetered Atlantic sturgeon and fishery independent surveys we know the Delaware Bay and marine environment is a corridor for subadults and adults to emigrate and immigrate from the Delaware River as well as an aggregation area for subadults. Breece et al. (2016) found that during spring migration seascapes can be a predictor of distribution and movement in the marine environment. The most preferred seascape area (E) can vary seasonally and interannually but was found near the mouth of the Delaware Bay and along the coast south of the Delaware Bay in the Atlantic Ocean. The seascape preference supports Dunton et al. (2010) who examined abundance and distribution of Atlantic sturgeon in the marine environment based on 5 fishery independent surveys. A majority of the Atlantic sturgeon were subadults captured from Maine to North Carolina aggregating in specific locations around the mouths of estuaries and along narrow dispersal corridors in marine waters <20m in depth. The capture locations examined during spring, summer, fall and winter can vary but specific patterns emerge thus allowing for geographically specific critical habitat. Specific winter habitat is further supported by Laney et al. 2007 who found the coastal waters off North Carolina and Virginia to be important overwintering habitat and Collins and Smith (1997) that reported the same off the coast of South Carolina.

The proposed critical habitat rule in regards to the marine environment notes that aggregation areas do occur but suggests a paucity of data on the needs of each DPS and specific habitat utilization that is essential to conservation for each DPS. However, the proposed rule ignores the specific habitat presented both spatially and temporally in published literature (Breece et al. 2016, Dunton et al. 2010, Laney et al. 2007, Collins and Smith 1997). Figures 4-7 from Dunton et al. 2010, below, identify sturgeon capture locations for each season as well as the locations of each tow.

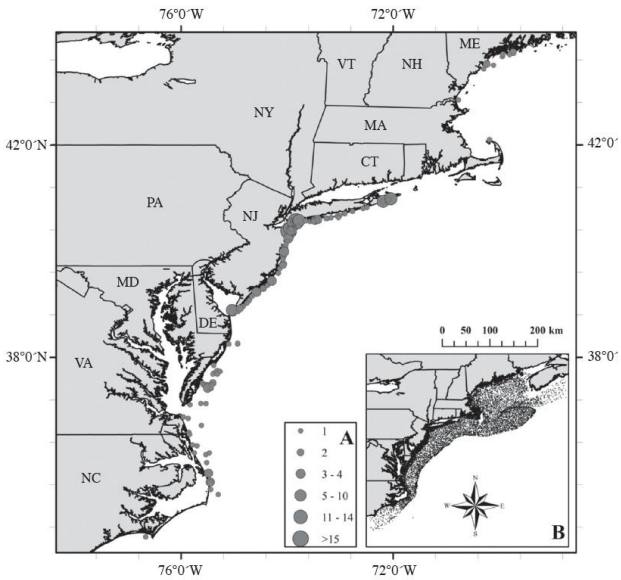


Figure 4

Number of captures of Atlantic sturgeon (*Acipenser oxyrinchus*) from all surveys during spring months. Circle size corresponds to total number of Atlantic sturgeon captured at a given location (insert **A**). Locations of all tows can be seen in insert **B**.

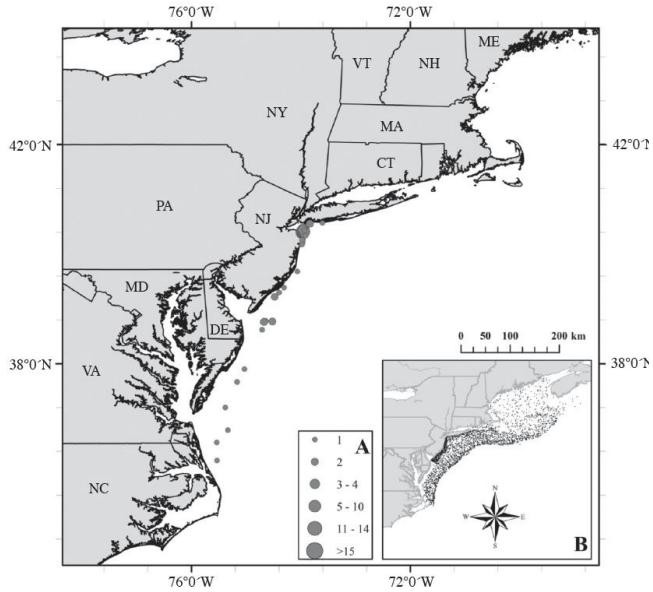


Figure 5

Number of captures of Atlantic sturgeon (*Acipenser oxyrinchus*) from all surveys during winter months. Circle size corresponds to total number of Atlantic sturgeon captured at a given location (insert **A**). Locations of all tows can be seen in insert **B**.

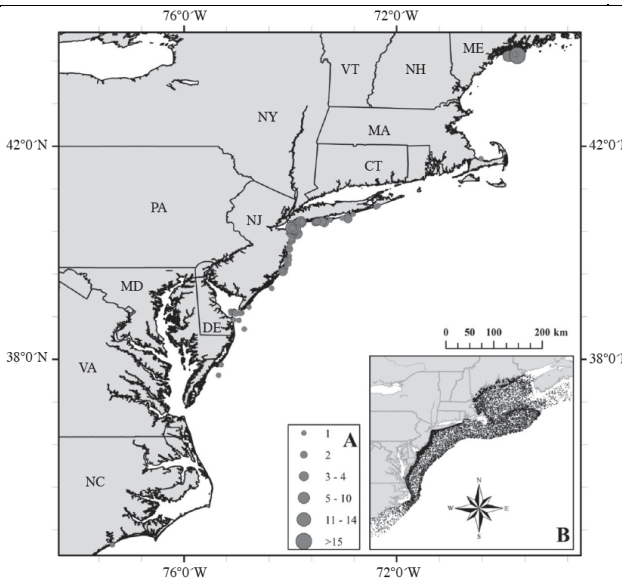


Figure 6

Number of captures of Atlantic sturgeon (*Acipenser oxyrinchus*) from all surveys during fall months. Circle size corresponds to total number of Atlantic sturgeon captured at a given location (insert **A**). Locations of all tows can be seen in insert **B**.

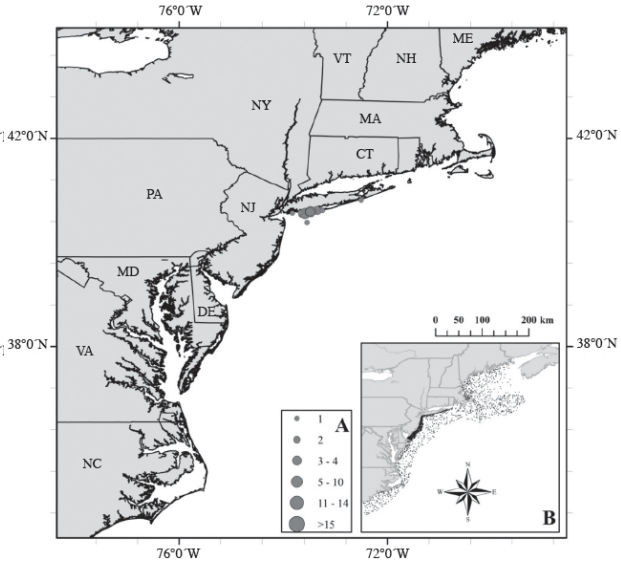


Figure 7

Number of captures of Atlantic sturgeon (*Acipenser oxyrinchus*) from all surveys during summer months. Circle size corresponds to total number of Atlantic sturgeon captured at a given location (insert **A**). Locations of all tows can be seen in insert **B**.

Figure 1 (below) from Breece et al. 2016 identifies the seascape E habitat that Atlantic sturgeon significantly prefer in the spring.

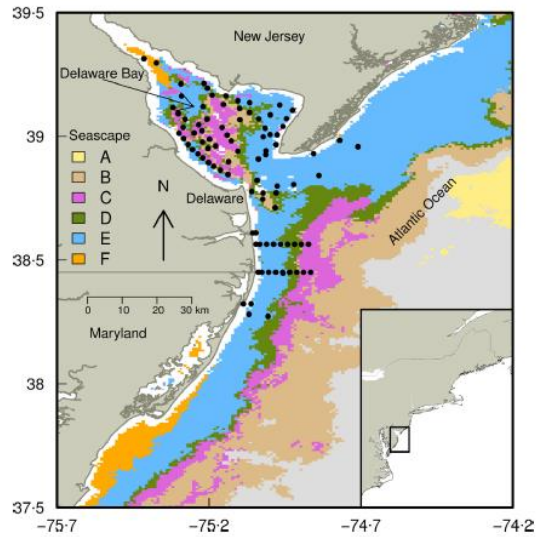
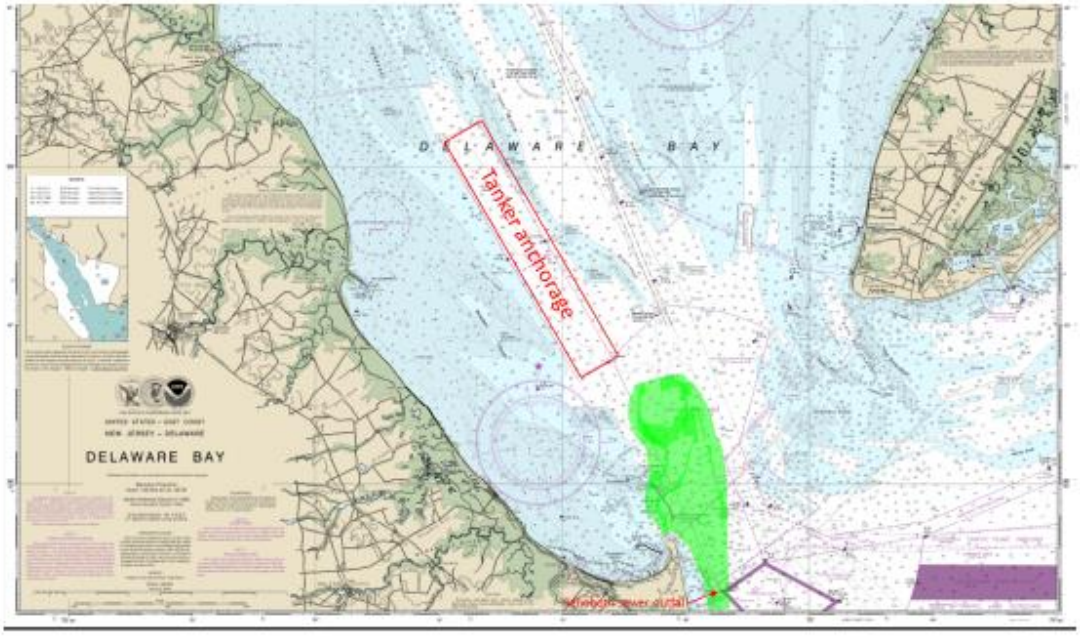


Fig. 1. Passive acoustic receiver locations (black dots) and example 8-day satellite seascape classes from 21 May 2009 (aggregated from May 18 to May 25) in the Delaware Bay and coastal Delaware, Maryland, and New Jersey. Seascape classes are listed as A–F.

The Delaware Bay and marine areas discussed in this comment and the cited literature also satisfy the requirement of needing special management considerations or protections. For example, offshore wind leases can potentially create a series of partial barriers to migration and alter habitat by changing bottom type, current flow dynamics and altering benthic forage communities. Another example is the installation of a sewer outfall 1 mile off of Rehoboth Beach Delaware. Sewage outflow will dramatically alter the benthic and fish community. The area off of Rehoboth Beach is part of a dense sturgeon aggregation in the summer months that extends from the Delaware bay near the tanker anchorage following hen and chicken shoal around the outer wall at Cape Henlopen (see green highlighted area in the figure below). Side scan sonar imagery from the aggregation area indicates the preferred sturgeon habitat has sand waves up to 7 meters high that can move with the tidal flow (personal com. D. Fox) while non-preferred areas do not have the sand waves. The sand waves likely form a flow refuge for sturgeon or provide some kind of forage opportunity. The sand wave is a physical attribute that is essential to the conservation of sturgeon habitat and sturgeon repeatedly occur there each summer. Another example of a special management consideration is that this dense aggregation is near the Delaware Bay tank anchorage (see red box in the figure below) where lightering frequently occurs. The Delaware Bay has a history of oil spills that have been documented by the U. S. Coast Guard.



For example, in September 1997, the tanker Mystras was engaged in a lightering operation when it spilled an estimated 20,000 gallons of oil into Delaware Bay (8,000 gallons were recovered). The cause was the failure of a valve isolating the ballast system from the cargo system. Also in late 1997, the tanker Alandia Bay spilled less than 100 gallons of oil into Delaware Bay in several separate discharges. The vessel was engaged in lightering, but the spill was traced to a heat exchanger for a vacuum pump. In 1996, the tanker Anitra spilled 500 to 800 gallons of oil into Delaware Bay when it entered the bay to engage in lightering. This spill was the result of an obstruction that prevented closure of a valve, allowing cargo to reach the ballast sea chest lines. When crude oil sinks it can settle on the nearby sand waves in the dense summer sturgeon aggregation area of the Delaware Bay and marine waters.

There are additional special management considerations in the Delaware Bay and marine waters in regards to vessel strikes, dredging, and by-catch. Below are locations of sturgeon carcasses that had evidence of vessel strike mortality (presentation by DNREC, Matt Fisher 2011). These locations suggest vessel strike mortalities are widespread and can occur in the Delaware River, Bay and marine waters. The presence of a vessel is a physical change to a sturgeon's essential habitat. When a spinning propeller is introduced deep in the water column it alters the habitat by abruptly causing water currents of up to 9 meters per second. This increased flow is too much for sturgeon to overcome and direct mortality or injury occurs when the sturgeon makes contact with the propeller or rudder. Thus the moving vessel alters the critical habitat of sturgeon and a vessel's speed and depth in critical habitat is a special management consideration.

Delaware Bay and marine aggregation areas and corridors presented in the literature and also unpublished but available data should be additionally included as critical habitat for Atlantic sturgeon. This habitat is essential because it provides access to adult spawning habitat, access to subadult summer foraging habitat, and provides summer foraging habitat for subadults and adults. Subadult foraging habitat is essential because if growth is limited, individuals may take longer to mature or be of smaller size upon maturity. Smaller female sturgeons carry fewer eggs and those that mature later will spawn fewer times in their lifespan thus ultimately reducing the rate of recruitment to the population. Additionally, Atlantic sturgeon subadults are routinely captured as bycatch in the spring gillnet striped bass fishery throughout the Delaware Bay and to a minor extent, the lower River. Atlantic sturgeon captures were reported by a voluntary logbook program by Delaware Division of Fish and Wildlife (DE DFW) but the program was suspended in 2012. Up to 300 individuals were estimated as by-catch annually by this fishery (see ASMFC Atlantic sturgeon compliance reports 1999-2012). From 1999-2012 a portion of captured sturgeon were tagged by participating watermen with a visible T-bar tag produced by DE DFW. However, very few tagged sturgeon were recaptured which is likely affected by tag shed and low reporting rate. Since 2012, DE DFW has been in the process of creating an Atlantic sturgeon Habitat Conservation Plan but it is unknown if any monitoring, analysis and mortality reporting will be included in the plan. The DE DFW trawl survey also captures Atlantic sturgeon in the Delaware Bay and River. These individuals are most often not tagged and genetic samples are not taken from all individuals to determine DPS origin. While the DE DFW's current lack of oversight of their spring fishery and trawl survey somewhat impairs our ability to identify the physical or biological features essential to sturgeon in the Delaware Bay, as outlined above, there is enough information to include areas of the Delaware Bay and some nearby marine waters as Atlantic sturgeon critical habitat.

Moreover, in order to provide additional information to expand the scope of Atlantic sturgeon critical habitat beyond those areas identified above, it is recommended that the DE DFW's Atlantic sturgeon Habitat Conservation Plan include a robust monitoring plan for sturgeon by-catch in the spring gillnet

fishery. The Plan should include the collection of genetic samples on all by catch and DE DFW trawl captures as well as an assessment of gillnetting mortality (including post release) in regards to captures in anchored nets versus drift nets. Managers need to be able to reduce sturgeon mortality supported by data based decisions within what this reviewer considers the critical habitat of the Delaware Bay.

Finally, the Philadelphia Naval Yard requested to exclude 3 areas from critical habitat designation (Federal Register page 35712) due to the consultations and project modifications required by critical habitat designation. Specific activities include not being able to dispose of ships in a timely manner and the effect it may have on testing naval systems which may affect national security. Navy activities were further defined as; updating and maintaining pier structures including pile driving, dredging activities to maintain proper channel and berthing depths, barge loading and unloading, fuel unloading. Since these activities will likely effect Atlantic sturgeon, consultations with NMFS will occur and will be handled through that process. Accordingly, NMFS does not anticipate there will be any national security impacts associated with the designation of critical habitat in these areas. This reviewer agrees with NMFS in that the mechanism of consultation for their activities is already in place and the critical habitat designation in the Navy areas will not delay that process. This reviewer also agrees with the draft economic analysis that since consultation for each activity will be coextensive the cost estimates for the Navy during consultation will be on the minimum side of the cost estimate.

References

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