UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

September 24, 2020

Jolie Harrison
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Office of Protected Resources, NOAA Fisheries
1315 East-West Highway
Silver Spring, MD, 20910

RE: ESA Section 7 Consultation regarding Ørsted Wind Power North America's, LLC's proposed marine site characterization surveys in the area of OCS-A 0486, 0517, 0487, and 0500 lease areas and potential export cable routes in coastal waters from New York to Massachusetts

Dear Ms. Harrison,

This correspondence responds to your request for consultation pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended, for Ørsted Wind Power North America's, LLC (Ørsted) proposed site characterization surveys on the Outer Continental Shelf (OCS) Lease Areas OCS-A 0486, 0517, 0487, and 0500 (Lease Areas) and along potential export cable routes to landfall locations between Raritan Bay (part of the New York Bight) and Falmouth, Massachusetts. At this time, the National Marine Fisheries Service (NMFS) Office of Protected Resources (OPR) is proposing to issue an Incidental Harassment Authorization (IHA) to Ørsted pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA). The proposed IHA published in the Federal Register (FR) on August 10, 2020 (85 *FR* 48179). The proposed IHA would be valid from September 25, 2020 to September 25, 2021.

During this consultation, we determined in cooperation with staff from the OPR's Permits and Conservation Division that all effects of the proposed surveys to species listed under the ESA would be insignificant or extremely unlikely to occur and therefore, the proposed action is not likely to adversely affect any ESA-listed species. No critical habitat would be affected by the action. These determinations were based on an evaluation of the effects of the proposed action, the extent of the anticipated underwater noise, the expected exposure of listed species to that noise, the best available information on the expected responses to that exposure, and whether those anticipated responses met NMFS interim definition of harassment under the ESA. The rationale for our conclusions is presented here.

On April 10, 2013, we issued a programmatic biological opinion (Opinion) to the Bureau of Ocean Energy Management (BOEM) that analyzed the effects of site characterization activities to be carried out in the Massachusetts (MA), Rhode Island (RI), New York, and New Jersey wind energy areas (WEA). This Opinion considered the effects to listed species associated with reasonably foreseeable site characterization scenarios associated with leasing (including geophysical, geotechnical, archeological and biological surveys), and for the RI/MA and MA WEAs site characterization activities (including the installation, operation and decommissioning

of meteorological towers and buoys). The programmatic consultation established a procedure for reviewing future actions to determine if they were consistent with the scope of the 2013 Opinion. This Opinion was later amended to add the Office of Protected Resources as an action agency in consideration of the anticipated need for incidental take authorizations under the MMPA for some of the activities considered in the Opinion.

An existing IHA, published in the Federal Register on October 2, 2019 (84 *FR* 52464), for the same Lease Areas and potential export cable routes is valid through September 25, 2020; the new proposed IHA considers similar surveys in this area to be carried out through September 2021. The Bureau of Ocean Energy Management (BOEM) has determined that the proposed survey activities are consistent with the scope of activities considered in the 2013 ESA consultation referenced above. We agree with BOEM's determination that (a) Ørsted's proposed surveys are consistent with the activities considered in the Opinion; (b) the measures proposed by Ørsted are consistent with the project design criteria identified in the Opinion; and, (c) the effects of the activities to be carried out by Ørsted in accordance with their 2020-2021 survey plan are within the scope of effects considered in the 2013 Opinion. While in the Opinion we considered that some survey activities may result in the take of ESA-listed species, in coordination with BOEM and OPR, we have determined that all effects to ESA-listed species from Ørsted's proposed survey would be insignificant or extremely unlikely to occur and therefore, the proposed surveys are not likely to adversely affect any ESA-listed species. The rationale for our conclusions is presented here. Based on these conclusions, no incidental take of any ESA-listed species is anticipated to occur as a result of Ørsted's surveys. The proposed action does not affect any designated critical habitat.

Ørsted's proposed activities are consistent with the Project Design Criteria included with the 2013 Opinion. Those criteria require maintenance of an exclusion zone by a Protected Species Observer to avoid exposure of ESA-listed whales and sea turtles to noise that may result in injury. As described in the 2013 Opinion, the default exclusion zone for sea turtles and whales other than North Atlantic right whales is 200 m, and can be modified if information is presented by the lessee to BOEM and it is determined that a smaller exclusion zone would achieve the same purposes. In the case of the Ørsted surveys, noise that could result in injury to ESA-listed whales or sea turtles will not extend more than 1 m from the source (see Ørsted IHA Application, Table 4). Ørsted will maintain a 500 m exclusion zone for right whales and a 100 m exclusion zone for other ESA-listed species. Given noise with the potential to result in injury is not expected to extend more than 1 m, we agree with the determinations made by BOEM that maintenance of the 500 m exclusion zone for right whales and the 100 m exclusion zone for other ESA-listed species will accomplish the intended purpose of the exclusion zone requirement (i.e., avoidance of exposure of ESA-listed whales and sea turtles to noise that may result in injury).

Summary of the Proposed Action

As noted above, OPR is proposing to issue an IHA under the MMPA to authorize take, by Level B harassment, of several species of marine mammals incidental to Ørsted's high-resolution geophysical (HRG) surveys associated with marine site characterization surveys activities. These surveys will occur in the area of OCS-A 0486, 0517, 0487, and 0500 lease areas and along potential export cable routes to landfall locations in coastal waters from New York to

Massachusetts between September 2020 and September 2021 (see Figure 1). OPR's Permits and Conservation Division has determined, consistent with the definition of MMPA Level B harassment, that the survey activities, which include the use of ultrashort baseline (USBL) and global acoustic positioning system (GAPS) transceiver systems, sub-bottom profilers (parametric and CHIRP), sparkers, and boomers will result in take of ESA-listed marine mammal species in the form of temporary behavioral disturbance or brief avoidance of the activity area when exposed to noise from the survey. The Permits and Conservation Division does not expect, and the IHA does not authorize, any take by injury, serious injury, or mortality. MMPA takes of ESA-listed species would be by Level B harassment only. The Permits and Conservation Division expects the proposed activity will result in the take under the MMPA of ESA-listed North Atlantic right, fin, sei, and sperm whales. Specifically, the expected take by MMPA Level B harassment of ESA-listed marine mammals is as follows:

Table 1. Numbers of Incidental Take of ESA-Listed Marine Mammals Authorized

Species	Level A take anticipated	Level B take anticipated
North Atlantic right whale	0	37
Fin whale	0	36
Sei whale	0	2
Sperm whale	0	3

Proposed monitoring and mitigation measures for Ørsted's proposed survey will be required by the IHA (85 *FR* 48179; August 10, 2020) as well as the leases issued to Ørsted by BOEM. Those requirements are incorporated by reference and generally consist of:

- Protected species monitoring by NMFS-approved protected species observers (PSOs);
- North Atlantic right whale specific measures including seasonal vessel restrictions;
- Exclusion zones of 500 m for right whales; 100 m for other ESA-listed species;
- Shutdown measures when marine mammals or sea turtles are detected within or about to enter the exclusion zones;
- A minimum of one PSO will monitor the exclusion (500 m exclusion zone for right whales and 100 m exclusion zone for all other protected species) zones during daylight hours when the sources are active, and a minimum of two PSOs during nighttime operations;
- Night vision technology will be used during nighttime surveys when sources are active
- PSOs will ensure exclusion zones are clear of protected species for a minimum 60 minutes prior to ramp-up procedures which provide protected species with a warning and to allow them to vacate the area; and
- Vessel strike avoidance measures.

This consultation does not evaluate the construction of any commercial electricity generating facilities or transmission cables with the potential to export electricity. Any such proposals for installation of electricity generating facilities (*i.e.*, installation of wind turbines) or transmission cables would be a separate federal action (including authorization from BOEM) requiring a

separate section 7 consultation. At this time, any future effects of wind farm construction, operation, and/or decommissioning, in the areas being surveyed are not reasonably certain to occur and are not considered here.

Proposed Survey Activities

Ørsted proposes to conduct marine site characterization surveys, including HRG surveys, in the Lease Area and along potential export cable routes between the southern portions of the Lease Areas and coastal waters from New York to Massachusetts (Figure 1). Surveys would occur from the time authorizations are issued, no earlier than September 25, 2020, through September 25, 2021. Multiple vessels would be used to conduct continuous HRG survey operations both 12-hours and 24-hours per day. Based on the combined 12-hour and 24-hour operations, the estimated duration of all survey segments would require 1,302 days. The survey activities are fully described in the proposed IHA (85 *FR* 48179; August 10, 2020) and incorporated here by reference.

Site characterization survey activities are anticipated to be supported by up to nine survey vessels operating concurrently. However, no more than 3 vessels are expected to work concurrently within any single lease area while an estimated four offshore (24-hour) vessels and two nearshore (12-hour) vessels are expected to work concurrently in the export cable routes. Additionally, a seasonal vessel restriction is in place where no more than 3 survey vessels will operate concurrently from January through May within the area that includes the three lease areas (OCSA 0486, 0487, and 0500) and the export cable route areas north of the lease areas up to, but not including, coastal and bay waters.

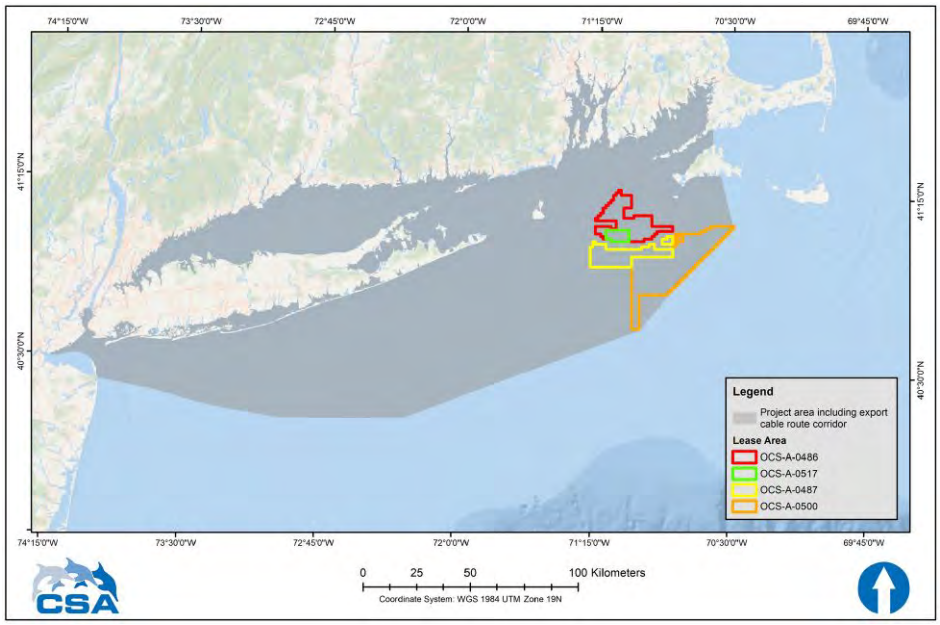

Figure 1. Ørsted proposed survey area

Source: Ørsted Wind IHA Application, available at: https://www.fisheries.noaa.gov/action/incidental-take-authorization-orsted-wind-power-north-america-llc-site-characterization; last accessed September 15, 2020.

The deployment of HRG survey equipment has the potential to cause acoustic harassment of listed species. Table 2 identifies the representative survey equipment that may be used in

support of planned geophysical survey activities. The make and model of the listed geophysical equipment will vary depending on availability and the final equipment choices will vary depending upon the final survey design, vessel availability, and survey contractor selection. Any survey equipment selected would have characteristics similar to the systems described below.

Table 2. Summary of Geophysical Survey Equipment Proposed for Use by Ørsted.

Equipment	Source Type	Operational Parameters						
		Operating Frequency (kHz)	SL_{rms} (dB re 1 µPa m)	$SL_{0\text{-}pk}$ (dB re 1 µPa m)	Pulse Duration (width) (millisecond)	Repetition Rate (Hz)	Beamwidth (degrees)	**T** = towed; **PM** = pole-mounted; **HM**= hull-mounted; **SM** = seabed-mounted; **EM** = equipment-mounted
Shallow Sub-bottom Profilers (CHIRP Sonars)								
ET 216 (2000DS or 3200 top unit)	Non-impulsive, mobile, intermittent	2–16 2–8	195	-	20	6	24	PM/T/EM
ET 424	Non-impulsive, mobile, intermittent	4–24	176	-	3.4	2	71	PM/T/EM
ET 512	Non-impulsive, mobile, intermittent	0.7–12	179	-	9	8	80	PM/T/EM
GeoPulse 5430A	Non-impulsive, mobile, intermittent	2–17	196	-	50	10	55	PM/T/EM
Teledyne Benthos Chirp III - TTV 170	Non-impulsive, mobile, intermittent	2–7	197	-	60	15	100	PM/T/EM
Parametric Sub-bottom Profilers								
Innomar, SES-2000 compact	Non-impulsive, mobile, intermittent	85–115	222	-	1	40	4	PM/EM
Innomar, SES-2000 Light & Light Plus	Non-impulsive, mobile, Intermittent	85–115	222	-	1	50	4	PM/EM
Innomar, SES-2000 Medium-70	Non-impulsive, mobile, intermittent	60–80	231	-	5	40	3	PM/EM
Innomar, SES-2000 Medium-100	Non-impulsive, mobile, intermittent	85–115	232	-	3.5	40	2	PM/EM
Innomar, SES-2000 Quattro	Non-impulsive, mobile, Intermittent	85–115	220	-	1	60	3–5	PM/EM
Innomar, SES-2000 Smart	Non-impulsive, mobile, intermittent	90–110	220	-	0.5	40	5	PM/EM
Innomar, SES-2000 Standard & Standard Plus	Non-impulsive, mobile, intermittent	85–115	225	-	1.5	60	1–3.5	PM/EM
Medium Sub-bottom Profilers (Sparkers & Boomers)								
AA, Dura-spark UHD (400 tips, 500 J)[1]	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	T
AA, Dura-spark UHD (400+400)[1]	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	T

GeoMarine, Geo-Source or similar dual 400 tip sparker (≤800 J)[1]	Impulsive, mobile	0.4–5	203	211	1.1	2	Omni	T
GeoMarine Geo-Source 200 tip light weight sparker (400 J)[1]	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	T
GeoMarine Geo-Source 200-400 tip freshwater sparker (400 J)[1]	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	T
AA, triple plate S-Boom (700–1,000 J)[2]	Impulsive, mobile	0.1–5	205	211	0.6	4	80	T
Acoustic Corers								
PanGeo (LF CHIRP)	Non-impulsive, stationary, intermittent	2–6.5	177.5	-	4.5	0.06	73	SM
PanGeo (HF CHIRP)	Non-impulsive, stationary, intermittent	4.5–12.5	177.5	-	4.5	0.06	73	SM
Acoustic Positioning Systems (USBL)								
Advances Navigation, Subsonus	Non-impulsive, mobile, intermittent	30	NR	176	90	5	Up to 300	PM/HM/EM
AA, Easytrak Alpha	Non-impulsive, mobile, intermittent	18–24	189	192	10	0.125–1	Up to 180	PM/HM/EM
AA, Easytrak Nexus 2	Non-impulsive, mobile, intermittent	18–24	192	193	10	2	150-180	PM/HM/EM
AA, Easytrak Nexus Lite	Non-impulsive, mobile, intermittent	18–24	190	192	10	2	180	PM/HM/EM
ET, BATS II	Non-impulsive, mobile, intermittent	16–21	NR	NR	1-15	0.05–1.67	90	PM/HM/EM
EvoLogics, S2C	Non-impulsive, mobile, intermittent	18–78	NR	NR	NR	NR	100-Omni	PM/HM/EM
iXblue, IxSea GAPS Beacon System	Non-impulsive, mobile, intermittent	8–16	188	-	10	1	Omni	PM/HM/EM
Kongsberg HiPAP 501/502	Non-impulsive, mobile, intermittent	20.5–29.6	NR	207	30	0.8–30	15	PM/HM/EM
Sonardyne Ranger 2 and Mini Ranger 2 USBL HPT 3000/5/7000	Non-impulsive, mobile, intermittent	19–34	194	NR	5	1	NR	PM/HM/EM
Sonardyne Scout Pro	Non-impulsive, mobile, intermittent	35–50	188	NR	5	3	NR	PM/HM/EM

Tritech, MicroNav	Non-impulsive, mobile, intermittent	20–28	NR	169	NR	0.1–2	180	PM/HM/EM
Sonardyne Scout Pro	Non-impulsive, mobile, intermittent	35–50	188	NR	5	3	NR	PM/HM/EM
Tritech, MicroNav	Non-impulsive, mobile, intermittent	20–28	NR	169	NR	0.1–2	180	PM/HM/EM

- = not applicable; NR = not reported; µPa = micropascal; AA = Applied Acoustics; BATS = Broadband Acoustic Tracking System; dB = decibel; ET = EdgeTech; GAPS = Global Acoustic Positioning System; HF = high-frequency; HiPAP = high-precision acoustic positioning system; J = joule; LF = low-frequency; Omni = omnidirectional source; re = referenced to; SL = source level; $SL_{0\text{-}pk}$ = zero to peak source level; SL_{rms} = root-mean-square source level; UHD = ultra-high definition; WFA = weighting factor adjustments.
[1]The Dura-spark measurements and specifications provided in Crocker and Fratantonio (2016) were used for all sparker systems proposed for the survey. The data provided in Crocker and Fratantonio (2016) represent the most applicable data for similar sparker systems with comparable operating methods and settings when manufacturer or other reliable measurements are not available.
[2]Crocker and Fratantonio (2016) provide S-Boom measurements using two different power sources (CSP-D700 and CSP-N). The CSP-D700 power source was used in the 700 J measurements but not in the 1,000 J measurements. The CSP-N source was measured for both 700 J and 1,000 J operations but resulted in a lower SL; therefore, the single maximum SL value was used for both operational levels of the S-Boom.

Action Area

The action area is defined by regulation as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02). For the purposes of this consultation, the action area includes the area where surveys will take place, which are the Lease Areas (OCS-A 0486, 0517, 0487, and 0500), along potential export cable routes between the southern portions of the Lease Areas and shoreline locations from New York to Massachusetts and the area in which disturbing levels of noise may be experience.

All effects of the proposed action, including vessel transits, will be experienced within the survey area plus the area extending up to 500 m[1] from the edge of the survey area where potentially disturbing levels of underwater noise would be experienced.

The vessels operating within the lease areas most frequently are commercial fishing vessels and tugboats and barges followed by recreational vessels such as pleasure boats, charter fishing vessels, and sailboats. Research and underwater operations vessels, cargo vessels, and tankers, as well as military vessels/search and rescue vessels are also observed in the lease areas, but less frequently. The cable route areas are mostly trafficked by commercial fishing vessels, tugboats and barges, tankers and cargo vessels, pleasure craft, passenger ferries, and high speed craft. Overall, the action area experiences high levels of commercial traffic.

Listed Species In the Action Area

The ESA-listed species expected to occur within the action area are listed in Table 3, along with their regulatory status.

[1] Noise that is potentially disturbing to Atlantic sturgeon extends approximately 500m from the sparker; the extent of potentially disturbing noise to whales and sea turtles is a maximum of 141 m.

Table 3. ESA-listed species and DPSs that may be affected by the proposed action.

Species	Status
Atlantic sturgeon: Gulf of Maine DPS	Threatened
Atlantic sturgeon: New York Bight, Chesapeake Bay, Carolina and South Atlantic DPSs	Endangered
Fin Whale	Endangered
North Atlantic right whale	Endangered
Sei Whale	Endangered
Sperm Whale	Endangered
Green Sea Turtle: North Atlantic Ocean DPS	Threatened
Kemp's Ridley Sea Turtle	Endangered
Leatherback Sea Turtle	Endangered
Loggerhead Sea Turtle: Northwest Atlantic Ocean DPS	Threatened

Sea Turtles

Comprehensive information on sea turtles in the action area is provided in the 2013 Opinion; a short summary is provided here. The distribution of sea turtles in the action area is limited by seasonal temperature patterns; sea turtles are extremely rare in the action area between November and April due to cold water temperatures (see, Shoop and Kenney 1992, TNC 2010, AMAPPS 2011). Sea turtles make seasonal migrations into the action area as water temperatures warm in the spring and summer, and then move south as waters cool in the fall. Sea turtles are expected to occur in the action area during the June – October survey period. In the action area, most hard-shelled turtles are juveniles or sub-adults, and occasionally adults, while adult leatherbacks are commonly present. The leatherback sea turtle is the most abundant species in the southern New England region and may be found in open-ocean habitats and foraging at the surface and throughout the water column (Dodge et al. 2014). Within the action area, coastal foraging habitats exist for all the above sea turtle species over the continental shelf and within nearshore waters.

Atlantic Sturgeon

Comprehensive information on use of the action area by Atlantic sturgeon is included in the 2013 Opinion, a summary is provided here. The marine range of all five Atlantic sturgeon DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida. Atlantic sturgeon originating from all five DPSs occur in the action area. Atlantic sturgeon spawn in their natal river and remain in the river until approximately age two and at lengths of approximately 76-92 cm (30-36 inches; ASSRT 2007). After emigration from the natal estuary, sub-adult and adult Atlantic sturgeon forage within the marine environment, typically in waters less than 50 m in depth, using coastal bays, sounds, and ocean waters (see ASSRT 2007). Only sub-adult or adult

Atlantic sturgeon would be present in the action area. Individuals are likely to be migrating and could also be foraging opportunistically. Atlantic sturgeon may be in the action area year round (NMFS 2017).

Large Whales
A full description of the use of the action area by North Atlantic right, sei, fin, and sperm whales is provided in the proposed IHA. Additional information is provided in the 2013 Opinion. In summary, the action area is used by migrating and foraging right, sei, fin, and sperm whales (Waring et al. 2016). Estimated densities (animals per km^2) of all marine mammal species that may be affected by the proposed surveys, for all survey areas, are shown in the IHA application. The density values used to estimate marine mammal exposure numbers are shown in Table 4 below

Table 4. Estimated average annual marine mammal densities (Number of Animals per km^2) in the Lease Areas and export cable route area.

	Lease Areas and Cable Route Area			
Species	0486/0517	0487	0500	Export cable route area
Fin whale	0.0021	0.0026	0.0027	0.0015
North Atlantic right whale	0.0026	0.0029	0.0027	0.0012
Sei whale	0.0001	0.0001	0.0002	0.0001
Sperm whale	0.0001	0.0001	0.0001	0.0001

Note: All density values derived from Roberts et al. (2016, 2018, 2020).

Effects of the Action
The proposed action may affect ESA-listed Atlantic sturgeon, sea turtles, and whales identified above due to exposure to increased underwater noise associated with the geophysical surveys and vessel use associated with the surveys.

Atlantic sturgeon

Geophysical Surveys
The only geophysical survey equipment that operates at a frequency within the estimated sturgeon hearing range (i.e., frequency less than 1 kHz; Lovell et al. 2005; Meyer et al. 2010) is the AA Triple plate S-Boom (700/1,000 J), AA, Dura-spark UHD (500 J/400 tip), AA, Dura-spark UHD 400+400, and the GeoMarine, Geo-Source dual 400 tip sparker (see Table 2). All other survey equipment operates at a frequency higher than sturgeon are able to hear, therefore we do not expect any effects to sturgeon exposed to increased underwater noise from the other higher frequency survey equipment. The boomer and sparkers listed above produce impulsive sounds; therefore, it is reasonable to use the criteria developed for pile driving when considering effects of exposure to this equipment. However, unlike pile driving, which produces repetitive impulsive noise in a single location, the geophysical survey sound sources are moving; therefore, the potential for repeated exposure to multiple pulses is much lower when compared to pile driving. We expect fish to react to noise that is disturbing by moving away from the sound source and avoiding further exposure. Injury and mortality is only known to occur when fish are

very close to the noise source and the noise is very loud and typically associated with pressure changes (i.e., impulsive pile driving or blasting).

The surveys will use a ramp up procedure; that is, noise producing equipment will not be used at full energy right away. This gives any fish in the immediate area a "warning" and an opportunity to leave the area before the full energy of the survey equipment is used. The available information suggests that for pile driving, peak noise levels need to be at least 206 dB re: 1uPa peak before physiological impacts are likely (FHWG 2008). The only equipment that has a source level of at least 206 dB re: 1uPa peak[2] and is within the hearing range of Atlantic sturgeon is the AA Triple plate S-Boom (700/1,000 J), AA, Dura-spark UHD (500 J/400 tip), AA, Dura-spark UHD 400+400, GeoMarine, Geo-Source dual 400 tip sparker (211 dB re: 1uPa peak at 1m) (Table 2). In order to be exposed to peak energy of 206 dB re: 1uPa from this source, a sturgeon would need to be within 5 m of the source (Ørsted 2020). This is extremely unlikely to occur given the dispersed nature of sturgeon distribution in the action area, the use of a ramp up procedure, and the expectation that sturgeon will swim away, rather than towards the noise source. This risk is further reduced by the relatively narrow beam width of these sources which reduces the area where underwater noise is experienced and therefore, reduces the potential for exposure. Based on this, no physical effects to any Atlantic sturgeon, including injury or mortality, are expected to result from the geophysical surveys.

We use 150 dB re: 1 µPa rms as a threshold for examining the potential for behavioral responses by sturgeon. This is supported by information provided in a number of studies (Andersson et al. 2007, Purser and Radford 2011, Wysocki et al. 2007). In the worst case, we expect that sturgeon would completely avoid the area ensonified above 150 dB re: 1uPa rms. However, because the area where increased underwater noise will be experienced is small (extending less than 500 m from the source; BOEM 2018), transient and increased underwater noise will only be experienced in a particular area for seconds, we expect any effects to behavior to be minor and limited to a temporary disruption of normal behaviors, temporary avoidance of the ensonified area and minor additional energy expenditure spent while swimming away from the noisy area. If foraging, resting, or migrations are disrupted, we expect that these behaviors will quickly resume once the survey vessel has left the area (i.e., in seconds to minutes). No sturgeon will be displaced from a particular area (approximately 500 m) for more than a few seconds. While the movements of individual Atlantic sturgeon will be affected by the sound associated with the survey, these effects will be temporary and localized and these fish are not expected to be excluded from the action area and there will be only a minimal impact on foraging, migrating or resting sturgeon. Major shifts in habitat use or distribution or foraging success are not expected. Effects to individual sturgeon from brief exposure to potentially disturbing levels of noise are expected to be limited to a brief startle or short displacement and will be so small that they cannot be meaningfully measured, detected, or evaluated; therefore, effects of exposure to survey noise are insignificant.

Vessel Traffic

While Atlantic sturgeon are known to be struck and killed by vessels in rivers and estuaries located adjacent to spawning rivers (i.e., Delaware Bay), we have no reports of vessel strikes in the marine environment. We have considered whether the increase in vessel traffic is likely to

[2] We converted the values in Table 2 from rms to peak by adding 10 dB consistent with Greene 1997.

increase the risk of strike for Atlantic sturgeon in the action area. The dispersed nature of Atlantic sturgeon and the limited increase in vessel traffic associated with the surveys in the action area (no more than 3 vessels are expected to work concurrently within any single lease area while an estimated four offshore (24-hour) vessels and two nearshore (12-hour) vessels are expected to work concurrently in the export cable routes) means that the potential for co-occurrence between a project vessel and an Atlantic sturgeon is low. In order to be struck by a vessel, an Atlantic sturgeon needs to co-occur with the vessel hull or propeller in the water column. Given the relatively small number of additional vessels, the depths in the vast majority of the action area (with the exception of nearshore survey areas and where vessels will dock; these areas are not known to be used by Atlantic sturgeon) and that sturgeon occur at or near the bottom while in the action area, the potential for co-occurrence of a vessel and a sturgeon in the water column is extremely low even if a sturgeon and vessel co-occurred generally. The areas to be transited by the vessels are free flowing with no obstructions; therefore, even in the event that a sturgeon was in the upper water column such that it could be vulnerable to strike, there is ample room for a sturgeon swim deeper to avoid a vessel or to swim away from it which further reduces the potential for strike. Considering this, it is extremely unlikely that any project vessels will strike an Atlantic sturgeon during survey activities. We have also considered whether avoiding these project vessels increases the risk of being struck by non-project vessels operating in the action area. In order for this to occur, another vessel would have to be close enough to the project vessel such that the animal's evasive movements made it such that it was less likely to avoid the nearby vessel. Given common navigational safety practices (i.e., not traveling too close to other vessels to minimize the risk of collisions), it is extremely unlikely that another vessel would be close enough such that a sturgeon avoiding a project vessel would not be able to avoid another non-project vessel or that the risk of being struck by another non-project vessel would otherwise increase. Based on this analysis, and in consideration of the environmental baseline, strike of an Atlantic sturgeon by a project vessel is extremely unlikely to occur.

Sea Turtles

Acoustic Thresholds

In order to evaluate the effects of exposure to the survey noise by sea turtles, we rely on the available scientific literature. Sea turtles are low frequency hearing specialists, typically hearing frequencies from 30 Hz to 2 kHz, with a range of maximum sensitivity between 100 to 800 Hz (Ridgway et al. 1969, Lenhardt 1994, Bartol et al. 1999 Lenhardt 2002, Bartol and Ketten 2006). Currently, the best available data come from studies by O'Hara and Wilcox (1990) and McCauley et al. (2000b), who experimentally examined behavioral responses of sea turtles in response to seismic airguns. O'Hara and Wilcox (1990) found that loggerhead turtles exhibited avoidance behavior at estimated sound levels of 175 to 176 dB re: 1 µPa (rms) (or slightly less) in a shallow canal. McCauley et al. (2000b) reported a noticeable increase in swimming behavior for both green and loggerhead turtles at received levels of 166 dB re: 1 µPa (rms). At 175 dB re: 1 µPa (rms), both green and loggerhead turtles displayed increased swimming speed and increasingly erratic behavior (McCauley et al. 2000b). Based on these data, we assume that sea turtles would exhibit a behavioral response when exposed to received levels of 175 dB re: 1 µPa (rms) and higher.

In order to evaluate the effects of exposure to the survey noise by sea turtles that could result in physical effects, we relied on the available literature related to the noise levels that would be expected to result in sound-induced hearing loss (i.e., temporary threshold shift (TTS) or permanent threshold shift (PTS)); we relied on acoustic thresholds for PTS and TTS for impulsive sounds developed by the U.S. Navy for Phase III of their programmatic approach to evaluating the environmental effects of their military readiness activities (U.S. Navy 2017). At the time of this consultation, we consider these to be the best available data since they rely on all available information on sea turtle hearing and employ the same statistical methodology to derive thresholds as in NMFS recently issued technical guidance for auditory injury of marine mammals (NOAA 2016). Below we briefly detail these thresholds and their derivation. More information can be found in the U.S. Navy's Technical report on the subject (U.S. Navy 2017).

To estimate received levels from airguns and other impulsive sources expected to produce TTS in sea turtles, the U.S. Navy compiled all sea turtle audiograms available in the literature in an effort to create a composite audiogram for sea turtles as a hearing group. Since these data were insufficient to successfully model a composite audiogram via a fitted curve as was done for marine mammals, median audiogram values were used in forming the hearing group's composite audiogram. Based on this composite audiogram and data on the onset of TTS in fishes, an auditory weighting function was created to estimate the susceptibility of sea turtles to TTS. Data from fishes were used since there are currently no data on TTS for sea turtles and fishes are considered to have hearing more similar to sea turtles than do marine mammals (Popper et al. 2014). Assuming a similar relationship between TTS onset and PTS onset as has been described for humans and the available data on marine mammals, an extrapolation to PTS susceptibility of sea turtles was made based on the methods proposed by (Southall et al. 2007). From these data and analyses, dual metric thresholds were established similar to those for marine mammals: one threshold based on peak sound pressure level (0-pk SPL) that does not incorporate the auditory weighting function nor the duration of exposure, and another based on cumulative sound exposure level (SEL_{cum}) that incorporates both the auditory weighting function and the exposure duration (Table 5). However, in order for the cumulative SEL metric to be relevant, a sea turtle would need to be exposed repeatedly to the sound source for the entire time period considered in the calculation (in this case, 24 hours). It is not reasonable to expect that any individual sea turtle would be exposed to the geophysical surveys repeatedly for an entire 24 hour period for the following reasons: the surveys will take place in open ocean environment where there are no impediments to movement; sea turtles in the action area are migratory individuals and there are no known aggregation areas where sea turtles would be resident for even a day at a time; and, the sound source will be constantly moving which eliminates the potential for continuous exposure even if a sea turtle did stay in the same small area for an extended period of time. For these reasons, we only consider the peak exposure (i.e., exposure to a single sound) to be relevant to this analysis.

Table 5. Acoustic thresholds identifying the onset of permanent threshold shift and temporary threshold shift for sea turtles exposed to impulsive sounds (U.S. Navy 2017).

Hearing Group	Generalized Hearing Range	Permanent Threshold Shift Onset	Temporary Threshold Shift Onset
Sea Turtles	30 Hz to 2 kHz	204 dB re: 1 µPa²·s SEL_{cum} 232 dB re: 1 µPa SPL (0-pk)	189 dB re: 1 µPa²·s SEL_{cum} 226 dB re: 1 µPa SPL (0-pk)

The only equipment being operated for this survey that overlaps with the hearing range for sea turtles is the AA Triple plate S-Boom (700/1,000 J), AA, Dura-spark UHD (500 J/400 tip), AA, Dura-spark UHD 400+400, GeoMarine, Geo-Source dual 400 tip sparker. None of these sources are loud enough to result in PTS or TTS based on the peak exposure criteria (Table 2). Therefore, PTS and TTS are extremely unlikely to occur.

As explained above, we assume that sea turtles would exhibit a behavioral response when exposed to received levels of 175 dB re: 1 µPa (rms) and higher at frequencies they can hear (see above). Modeled distances to the 175 dB re: 1 µPa (rms) isopleth were not provided by the applicant, BOEM, or NMFS OPR. However, distances to the 160 dB re: 1 µPa (rms) isopleth were provided; given that the size of the 160 dB re: 1 µPa (rms) isopleth will be larger than the size of the 175 dB re: 1 µPa (rms) isopleth (because sound dissipates with distance from the sound source), using the 160 dB re: 1 µPa (rms) isopleth indicates that the area where sea turtles would experience potentially disturbing levels of sound is even smaller. The area with noise above 160 dB re: 1uPa (rms) within the hearing range of sea turtles extends 12 m from the ET 216 CHIRP SBP, , 6 m from the ET 512i CHIRP SBP, 29 m from the GeoPulse 5430, 54 m from the TB CHIRP III, 76 m from the AA Triple plate S-Boom (700/1,000 J), 141 m from the AA, Dura-spark UHD (500 J/400 tip), AA, Dura-spark UHD 400+400, GeoMarine, Geo-Source dual 400 tip sparkers, (Crocker and Fratantonio (2016) as cited in Ørsted 2020). Thus, a sea turtle would need to be within the distances listed above to be exposed to potentially disturbing levels of noise. We expect that sea turtles would react to this exposure by swimming away from the sound source; this would limit exposure to a short time period, just the few seconds it would take an individual to swim away to avoid the noise.

The risk of exposure to potentially disturbing levels of noise is reduced by the use of observers to monitor the exclusion zone for sea turtles, which would be a requirement of the BOEM lease. The exclusion zone for sea turtles will extend for 100 m from the survey equipment; this limits the potential for exposure to disturbing levels of noise from the sparker. In the event that a sea turtle is observed in the exclusion zone, the BOEM lease requires that survey equipment be shut off (requirement 4.3.6.1). However, even in the event that a sea turtle is submerged and not seen by the observer, in the worst case, we expect that sea turtles would avoid the area ensonified by the survey equipment that they can perceive. Because the area where increased underwater noise will be experienced is transient and increased underwater noise will only be experienced in

a particular area for only seconds, we expect any effects to behavior to be minor and limited to a temporary disruption of normal behaviors, temporary avoidance of the ensonified area and minor additional energy expenditure spent while swimming away from the noisy area. If foraging or migrations are disrupted, we expect that they will quickly resume once the survey vessel has left the area. No sea turtles will be displaced from a particular area for more than a few minutes. While the movements of individual sea turtles will be affected by the sound associated with the survey, these effects will be temporary (seconds to minutes) and localized (avoiding an area no larger than 141 m) and there will be only a minor and temporary impact on foraging, migrating or resting sea turtles. Major shifts in habitat use or distribution or foraging success are not expected. Therefore, effects to individual sea turtles from brief exposure to potentially disturbing levels of noise are expected to be limited to a brief startle, short increase in swimming speed and/or short displacement and will be so small that they cannot be meaningfully measured, detected or evaluated; therefore, effects are insignificant.

Vessel Traffic

Sea turtles are vulnerable to vessel collisions because they regularly surface to breathe, and often rest at or near the surface. Sea turtles often congregate close to shorelines during the breeding season, where boat traffic is denser (Schofield et al. 2007; Schofield et al. 2010); however, the lack of nesting beaches in the action area makes this factor irrelevant for this analysis. Sea turtles, with the exception of hatchlings and pre-recruitment juveniles, spend a majority of their time submerged (Renaud and Carpenter 1994; Sasso and Witzell 2006). Although, Hazel et al. (2007) demonstrated sea turtles preferred to stay within the three meters of the water's surface, despite deeper water being available. Any of the sea turtle species found in the action area can occur at or near the surface in open-ocean and coastal areas, whether resting, feeding or periodically surfacing to breathe.

While research is limited on the relationship between sea turtles, ship collisions and ship speeds, sea turtles are at risk of vessel strike where they co-occur with vessels. Sea turtle detection is likely based primarily on the animal's ability to see the oncoming vessel, which would provide less time to react to vessels traveling at speeds at or above 10 knots (Hazel et al. 2007). Hazel et al. (2007) examined vessel strike risk to green sea turtles and suggested that sea turtles may habituate to vessel sound and are more likely to respond to the sight of a vessel rather than the sound of a vessel, although both may play a role in eliciting responses (Hazel et al. 2007). Regardless of what specific stressor associated with vessels turtles are responding, they only appear to show responses (avoidance behavior) at approximately 10 m or closer (Hazel et al. 2007). This is a concern because faster vessel speeds also have the potential to result in more serious injuries (Work et al. 2010). Although sea turtles can move quickly, Hazel et al. (2007) concluded that at vessel speeds above 4 km/hour (2.1 knots) vessel operators cannot rely on turtles to actively avoid being struck. Thus, sea turtles are not considered reliably capable of moving out of the way of vessels moving at speeds greater than 2.1 knots.

While vessel struck sea turtles have been observed throughout their range, including in the action area. As noted in NRC 1990, the regions of greatest concern for vessel strike are outside the action area and include areas with high concentrations of recreational-boat traffic such as the eastern Florida coast, the Florida Keys, and the shallow coastal bays in the Gulf of Mexico. In general, the risk of strike for sea turtles is considered to be greatest in areas with high densities of

sea turtles and small, fast moving vessels such as recreational vessels or speed boats (NRC 1990). Similarly, Foley et al. (2019) concluded that in a study in Florida, vessel strike risk for sea turtles was highest at inlets and passes. The action area does not have high densities of sea turtles and outside of the nearshore area where the survey vessels will be occasionally transiting to return to/from port, there is not a high density of small, fast moving vessels.

In order for a project vessel to strike a sea turtle there would need to be a co-occurrence in space and time and vessel operations would need to be such that the strike was not avoided. As described above, the density of vessel traffic in the survey area is not such that a sea turtle fleeing from a survey vessel may be struck be another oncoming vessel. Additionally, in general vessels should be not be operating in such close proximity and due to towed equipment, survey vessels request all other vessels stay adequate distance from them. Sea turtle density in the action area is low (0.00042-0.00133 loggerheads and 0.00042-0.00604 leatherbacks per km^2 [3], with the density of green and Kemp's ridleys being even lower) and no more than 3 vessels are expected to work concurrently within any single lease area while an estimated four offshore (24-hour) vessels and two nearshore (12-hour) vessels are expected to work concurrently in the export cable routes. This makes the likelihood of co-occurrence between an individual sea turtle and one of the survey vessels extremely low. This extremely low risk of a strike is further reduced by the slow speed that the survey vessels will be operating while carrying out survey activities (less than 4 knots) and the use of a dedicated lookout at all times to alert the vessel operator of any sighted sea turtles so the operator can slow down or take other action to avoid striking the turtle. Together, and in consideration of the environmental baseline, these factors make it extremely unlikely that any sea turtles will be struck by a survey vessel.

ESA Listed Whales

Geophysical Surveys

Geophysical surveys may temporarily impact marine mammals that are exposed to elevated in-water sound levels. Marine mammals are continually exposed to many sources of sound. Naturally occurring sounds such as lightning, rain, sub-sea earthquakes, and biological sounds (*e.g.*, snapping shrimp, whale songs) are widespread throughout the world's oceans. Marine mammals produce sounds in various contexts and use sound for various biological functions including, but not limited to: (1) social interactions; (2) foraging; (3) orientation; and, (4) predator detection. Interference with producing or receiving these sounds may result in adverse impacts. Audible distance, or received levels of sound depend on the nature of the sound source, ambient noise conditions, and the sensitivity of the receptor to the sound (Richardson et al. 1995). Type and significance of marine mammal reactions to sound are likely dependent on a variety of factors including, but not limited to: (1) the behavioral state of the animal (*e.g.*, feeding, traveling, etc.); (2) frequency of the sound; (3) distance between the animal and the source; and (4) the level of the sound relative to ambient conditions (Southall et al. 2007).

The specifications of the potential equipment planned for use during HRG survey activities (Table 2) were analyzed to determine which types of equipment would have the potential to be perceived by ESA listed whales. HRG equipment that would be operated either at frequency

[3] Data from SERDP SDSS Marine Animal Model Mapper (http://seamap.env.duke.edu/serdp, last accessed July 22, 2020)

ranges that fall outside the functional hearing ranges of marine mammals (*e.g.*, above 200 kHz) or that that operate within marine mammal functional hearing ranges but have low sound source levels (*e.g.*, a single pulse at less than 200 dB re: 1 μPa rms) were assumed to not have the potential to result in effects to ESA listed whales and were therefore eliminated from further analysis. Of the potential HRG survey equipment planned for use, the shallow sub-bottom profilers, the parametric sub-bottom profilers, the medium sub-bottom profilers (AA Triple plate S-Boom (700/1,000 J), AA, Dura-spark UHD (500 J/400 tip), AA, Dura-spark UHD 400+400, GeoMarine, Geo-Source dual 400 tip sparker), the acoustic corers, and the acoustic positioning system (USBL) (see Table 2) all operate at a frequency that overlaps with the hearing range of ESA listed whales that occur in the action area.

The Permits and Conservation Division has determined take by Level A harassment is not an expected outcome of the proposed activity; and, thus, is not proposing to authorize under the MMPA the take of any marine mammals by Level A harassment. For the ESA-listed marine mammals considered here, noise above the Level A harassment threshold is only expected at distances of less than 1 meter from the sound source (Ørsted 2020). Through terms of BOEM's lease and the requirements of the proposed IHA, Ørsted will be required to maintain exclusion zones of 500 m for right whales and 100 m for all other ESA-listed whales. Because we do not expect that a whale could be close enough to the sound source to be exposed to potentially injurious levels of noise (i.e., within 1 m of the source) without being detected by the observer (even at night or in poor visibility), it is extremely unlikely that any whale would be exposed to underwater noise that could result in injury. This conclusion is consistent with the determinations made in the proposed IHA. The potential for behavioral effects is considered below.

As explained in the proposed IHA, the Permits and Conservation Division has determined that a small number of right, fin, sei, and sperm whales will be exposed to underwater noise during the surveys at or above the MMPA Level B harassment thresholds (i.e., 160 dB re: 1uPa rms). The area with underwater noise greater than 160 dB re: 1uPa rms extends no further than 12 m from the ET 216 CHIRP SBP, 4 m from the ET 424 CHIRP SBP, 6 m from the ET 512i CHIRP SBP, 29 m from the GeoPulse 5430, 54 m from the TB CHIRP III, 4 m from the Innomar Parametric SBPs, 76 m from the AA Triple plate S-Boom (700/1,000 J), 141 m from the AA, Dura-spark UHD (500 J/400 tip), AA, Dura-spark UHD 400+400, GeoMarine, Geo-Source dual 400 tip sparkers, 4 m from the acoustic corers, and 50 m from the USBLs (Ørsted 2020). Ørsted will be required to maintain an exclusion zone extending 500 m from the source for right whales and 100 m from the source for all other ESA-listed whales. We expect that during fair weather and daylight, observers will be able to successfully maintain the exclusion zone and order the shutdown of noise producing equipment in time to avoid exposure of any North Atlantic right whales. However, given that the surveys will continue at night and during reduced visibility conditions and observers may not be able to detect all whales within the exclusion zone during those conditions, particularly those several hundred meters from the source, we agree with OPR's determination that there is the potential for exposure to noise greater than 160 dB re: 1uPa rms during poor visibility conditions, particularly at the outer edges of the exclusion zone. The exclusion zone for other ESA listed whales only extends 100m from the source; the area with underwater noise greater than 160 dB re: 1uPa rms extends to 141 m for the AA, Dura-spark UHD (500 J/400 tip), AA, Dura-spark UHD 400+400, GeoMarine, Geo-Source dual 400 tip

sparkers, thus there is the potential for fin, sei, and sperm whales to be exposed to those sources even with successful maintenance of the exclusion zone.

The MMPA Level B harassment numbers identified in the proposed IHA were calculated without consideration of the 500 m exclusion zone for right whales or the 100m exclusion zone for fin, sei, and sperm whales (i.e., they are the number that would be expected to be exposed even without an exclusion zone). Because OPR cannot determine the number of right whales that would be encountered at night or during other poor visibility conditions, it was not able to decrease the expected number of MMPA Level B harassment takes to account for the time when the observers will be able to successfully maintain the exclusion zone. Similarly, they were not able to refine the exposure estimate for fin, sei, and sperm whales considering the 100 m exclusion zone. Therefore, the Permits and Conservation Division expects that no more than 37 North Atlantic right whale, 36 fin whales, 2 sei whales and 3 sperm whales will be exposed to noise that meets the MMPA Level B harassment threshold.

Level B harassment is defined as an act of pursuit, torment, or annoyance that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. Under the NMFS' interim ESA definition, harassment is an act that would "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." Under NMFS regulation, Level B harassment does not include an act that has the potential to injure a marine mammal or marine mammal stock in the wild.

We have determined that, in this case, the exposure to noise above the MMPA Level B harassment threshold will result in effects that are insignificant for purposes of ESA consultation. This is because, consistent with the analysis presented in the proposed IHA, "We expect that all potential takes would be in the form of short-term Level B behavioral harassment in the form of temporary avoidance of the area, a reaction that is considered to be of low severity and with no lasting biological consequences (e.g., Ellison et al. 2007)." That is, given that exposure will be short (no more than a few seconds) and that the reaction to exposure is expected to be limited to changing course and swimming away from the noise source only far/long enough to get out of the ensonified area (swimming less than 141 m which would take less than a minute), and that no animals are expected to be exposed to the noise source more than once, the effect of this exposure and resulting response will be so small that it will not be able to be meaningfully detected, measured or evaluated and, therefore, is insignificant. Further, the action area is not a known breeding area for right, fin, sei or sperm whales and we do not expect brief interruptions of this behavior to have any lasting effects. Because these behavioral changes are so minor, it is not reasonable to expect that, under the NMFS' interim ESA definition of harassment, they are equivalent to an act that would "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering."

Vessel Traffic

Ørsted will implement measures (summarized below) set forth in the BOEM lease designed to minimize the potential for one of the survey vessels to strike a marine mammal in the survey area.

As described in the notice of proposed IHA, an examination of all known ship strikes from all shipping sources (civilian and military) indicates vessel speed is a principal factor in whether a vessel strike results in death of a whale (Knowlton and Kraus 2001; Laist *et al.,* 2001; Jensen and Silber 2003; Vanderlaan and Taggart 2007). In assessing records with known vessel speeds, Laist *et al.* (2001) found a direct relationship between the occurrence of a whale strike and the speed of the vessel involved in the collision. The authors concluded that most deaths occurred when a vessel was traveling in excess of 24.1 km/h (14.9 mph; 13 knots (kn)). All survey vessels will travel slowly (less than 4 knots) as required for data acquisition, will have lookouts posted for whales, and will adjust vessel operations as necessary to avoid strike during surveys. The only times that survey vessels will operate at speeds above 3 knots is during transit to and from the survey site where they may travel at speeds up to 12 knots (although several circumstances described below will restrict speed to 10 knots), a number of measures (described below) will be in place to minimize the risk of strike during these transits. Slow operating speeds mean that whales will be able to avoid the survey vessel and also that vessel operators have more time to respond and steer the vessel away from a whale. The use of dedicated lookouts to keep a constant watch for whales and to alert vessel operators of any sightings also allows vessel operators to avoid any sighted whales. Consistent with the conclusions reached in the IHA, we expect that the implementation of vessel strike avoidance measures will make it extremely unlikely that any of the three survey vessels will strike a whale.

The following measures, designed to reduce the risk of vessel strike, will be implemented:

1. All vessel operators and crews will maintain a vigilant watch for marine mammals at all times, and slow down or stop their vessel to avoid striking these protected species.
2. Complying with speed restrictions (≤10 knots) in North Atlantic right whale management areas including critical habitat, Seasonal Management Areas (SMAs), and active Dynamic Management Areas (DMAs).
3. All vessels 65 feet or greater will operate at speeds of 10 knots or less between November 1 through July 31.
4. Monitoring NMFS NARW reporting system and Whale Alert for 1) the presence of NARWs throughout survey operations, and 2) establishment of a DMA. If NMFS should establish a DMA in the Lease Areas under survey, the vessels will abide by speed restrictions in the DMA per the lease conditions.
5. Reducing vessel speeds to ≤10 knots when mother/calf pairs, pods, or large assemblages of marine mammals are observed.
6. Maintaining >500 m distance from North Atlantic right whales or an unidentified large marine mammal; if a right whale comes within 100 m, then reducing speed and shifting the engines into neutral, if safe to do so (see 9).
7. Maintaining >100 m from all other ESA-listed marine mammals.

8. If underway, vessels must steer a course away from any sighted NARW at 10 knots or less until the 500-m minimum separation distance has been established. If a NARW is sighted in a vessel's path, or within 500 m to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Engines will not be engaged until the NARW has moved outside of the vessel's path and beyond 500 m. If the whale is stationary, the vessel must not engage engines until the NARW has moved beyond 500 m.

Based on these requirements, the slow speed of the survey vessels and the use of observers and in consideration of the environmental baseline, it is extremely unlikely that a vessel associated with the surveys will strike an ESA-listed cetacean.

Conclusion

As described herein, the survey activities are not likely to adversely affect any ESA-listed whales, sea turtles or DPS of Atlantic sturgeon. Because the proposed activity and its effects fall within the scope of activities and their effects analyzed in the April 10, 2013 Programmatic Opinion, this letter and the 2013 Opinion as amended, completes consultation on OPR's authorization of the activities to be carried out by Ørsted under their 2020-2021 survey plan.

As stated in the April 10, 2013 opinion, and as provided in 50 CFR §402.16, reinitiation of consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may not have been previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species that was not considered; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. If you have any questions regarding this letter, please contact Nick Sisson at (978) 281-9179 or nick.sisson@noaa.gov.

Sincerely,

Jennifer Anderson

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