COMMUNITY
offshore wind

Application for an Incidental Harassment Authorization for the Non-Lethal Taking of Marine Mammals During a Site Characterization Survey

New York Bight Offshore Wind Energy Lease Area (OCS-A 0539)

27 February 2023

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Appendix A Manufacturer Specifications for Survey Equipment

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Acronyms and abbreviations

Acronym/Abbreviation	Definition
2D	2-Dimensional
3D	3-Dimensional
AMP	Alternative Monitoring Plan
BMP	Best Management Practices
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
Coastal Stock	Western North Atlantic Migratory Coastal Stock
Community Offshore Wind	Community Offshore Wind LLC
dB	Decibel
dB_{peak}	Peak Decibel Level
DFO	Fisheries and Ocean Canada
DMA	Dynamic Management Area
DPS	Distinct Population Segment
ECR	Export Cable Route
ESA	Endangered Species Act
ft	Feet
GIS	Geographic Information System
GPS	Global Positioning System
HF	High Frequency Cetaceans
HRG	High-resolution geophysical
Hz	Hertz
IHA	Incidental Harassment Authorization
J	Joules
kHz	Kilohertz
km	kilometers
kts	Knots
LF	Low Frequency Cetaceans
LOC	Letter of Concurrence

Acronym/Abbreviation	Definition
m	meters
MA	Mean annual
MBES	Multibeam Echosounder
MFC	Mid Frequency Cetacean
MM	Monthly mean
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NR	Not Reported
OCS	Outer Continental Shelf
Offshore Stock	Western North Atlantic Offshore Stock
OCSLA	Outer Continental Shelf Lands Act
PDC	Project Design Criteria
POC	Plan of Cooperation
PW	Phocid Pinnipeds in Water
PSO	Protected Species Observer
PTS	Permanent Threshold Shift
re	Referenced to
RMS	Root Mean Square
s	Seconds
SBP	Sub-bottom Profiler
SEL	Sound Exposure Level
SPL	Sound Pressure Level
SM	Seasonal maximum
SMA	Seasonal Management Area
SSS	Side Scan Sonar
UHRS	Ultra-High Resolution Seismic
µPa	Micro Pascal
US	United States
USC	United States Code

1 Description of Specified Activity

Community Offshore Wind LLC (Community Offshore Wind) is proposing to conduct marine site characterization surveys with high resolution geophysical (HRG) equipment in a Survey Area that includes Bureau of Ocean Energy Management (BOEM) Outer Continental Shelf (OCS) offshore wind Lease Area OCS-A 0539 (Lease Area) and associated potential Export Cable Route (ECR) survey area (ECR Area), collectively considered the Survey Area, located off the coasts of New York and New Jersey in the New York Bight in the Atlantic Ocean (Figure 1-1). Community Offshore Wind submits this request for an Incidental Harassment Authorization (IHA) pursuant to Section 101(a)(5) of the Marine Mammal Protection Act (MMPA) and 50 Code of Federal Regulations (CFR) § 216 Subpart I (CFR 2000), to allow for the Level B incidental harassment of small numbers of marine mammals resulting from the operation of HRG survey equipment operating at frequencies less than 180 kHz during upcoming field activities. Level A incidental harassment of marine mammals is not anticipated and is therefore not included in this request; the rationale for excluding Level A from this request is further described in Distance to Level A and B Isopleths Section 1.1.5.

The completion of HRG surveys will support development of offshore wind infrastructure within the Survey Area. The purpose of the HRG surveys is to

- Support the preliminary site characterization, siting, and engineering design in the Survey Area including wind turbine generators, offshore substations, and submarine cables; and
- Collect the data necessary to support Project review requirements associated with 30 CFR § 585 (CFR 2015) and the National Environmental Policy Act (42 United States Code [USC] § 4332; USC 1969).

Up to three vessels may be used simultaneously to conduct HRG survey activities. Different vessels may be used for surveys in different parts of the Survey Area (e.g., a smaller vessel may be used in shallower waters of the ECR). Vessels will be determined at the time a survey contractor is procured. Community Offshore Wind will follow requirements for vessel operations during geophysical activities identified in the NMFS Letter of Concurrence (LOC), dated June 29, 2021, associated with the outcome of Endangered Species Act (ESA) consultation with BOEM or future consultation outcomes as appropriate.

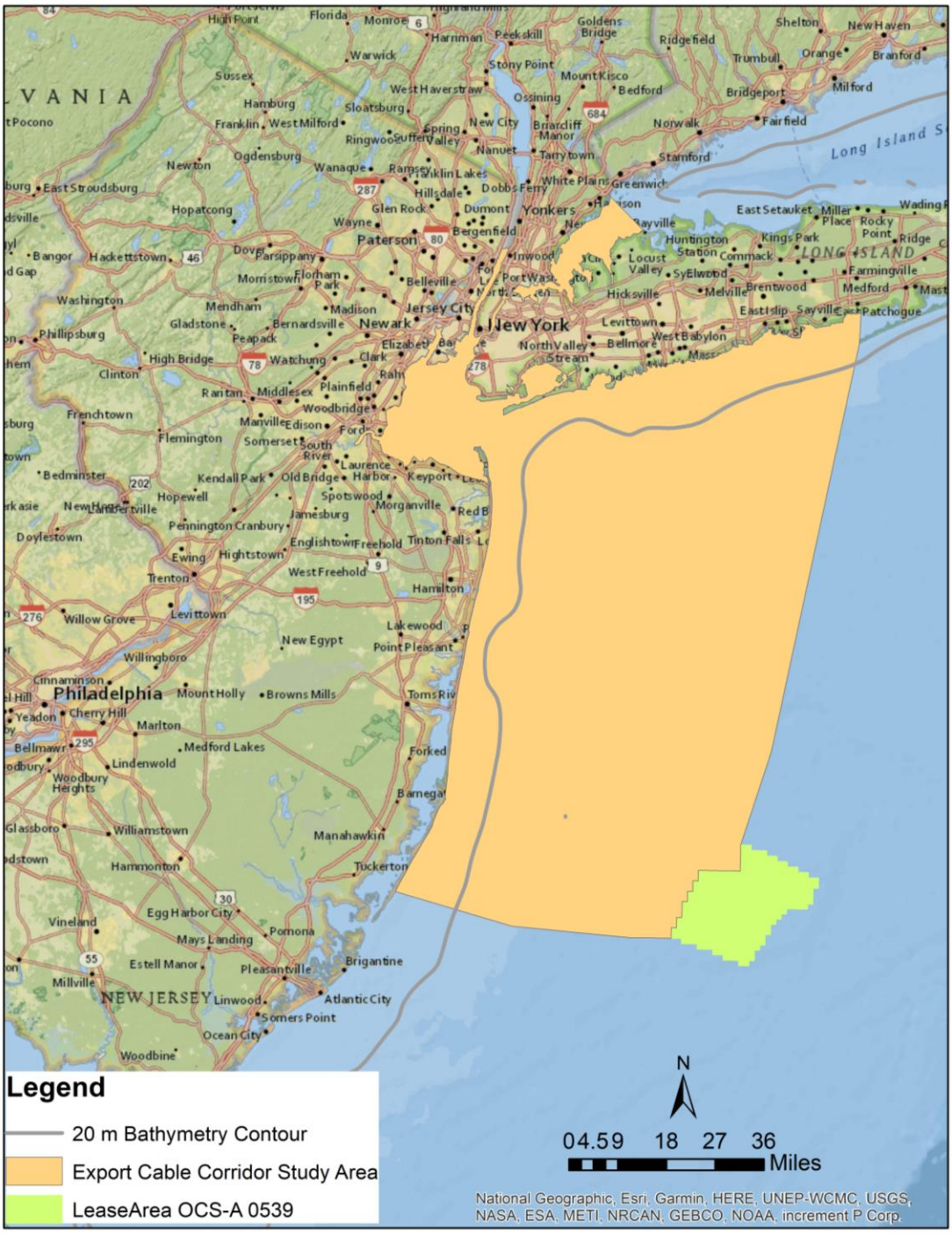


Figure 1-1 Map of New York Bight showing the Lease Area (green fill) and Export Cable Route Area (orange fill). Gray line is the 20 m bathymetry contour.

1.1 HRG Surveys

HRG data are required over all areas where there is potential for Project-related seafloor-disturbing activities, such as foundation and inter-array and export cable installation and other associated construction activities. Surveys within the Lease Area and ECR Area (Figure 1-1) will include the use of seafloor mapping equipment with operating frequencies above 180 kHz (e.g., multibeam echosounder [MBES]) and medium sub-bottom profilers (SBP; e.g., sparkers) with operating frequencies below 180 kHz to meet criteria for engineering, habitat delineation, and identification of archaeological resources and geohazards. Only sources with operating frequencies below 180 kHz are considered in this application.

The total areas within the Survey Area are as follows:

- Lease area (OCS-A 0539 plus a 500 m buffer): ~ 859 km2
- ECR area: ~ 13,900 km2 (note that the surveys will occur over a specified survey trackline length and not the entire polygon)
- Total area: ~14,759 km2

NMFS has defined the threshold level for Level B harassment at 160 dB re 1 µPa (sound pressure level [SPL]) for non-impulsive intermittent sources (e.g., sonar, CHIRPs) and impulsive sources (e.g., sparkers, boomers). The Harassment Zone is the area that is ensonified to those levels and constitutes the area in which a take of marine mammals could occur for purposes of estimating take numbers. The following sections provide specific information regarding the HRG survey activities considered in this application. Each section includes information on the types of activities and associated equipment to be deployed, how the equipment will interact with the surrounding physical and biological environment, and which activities may result in the taking of marine mammals per NMFS' established thresholds for Level B harassment.

1.1.1 Lease Area HRG Survey

Community Offshore Wind will acquire 2-dimensional (2D) or 3-dimensional (3D) ultra-high resolution seismic (UHRS) data at a line spacing controlled by water depth to meet BOEM coverage and resolution requirements within the entirety of the Lease Area plus a 500 m buffer. The proposed HRG survey activities that may result in Level B take include the following:

- 2D or 3D UHRS survey using a medium penetration sub-bottom profiler (SBP; sparker) to map deeper subsurface stratigraphy as needed (soils down to at least 100 m [328 ft] below seabed.

The HRG survey equipment operating at frequencies below 180 kHz (as described in Survey Equipment Section 1.1.3) proposed for use in the Lease and ECR Areas will be similar to the HRG survey equipment used to support other offshore wind development projects along the Atlantic Coast that have been previously approved by both NMFS and BOEM.

1.1.2 HRG Survey Area

The HRG survey will be conducted within the Lease Area plus a 500 m buffer area (Lease Area survey), and the ECRs (ECR Area survey; collectively the Survey Area). Within the Survey Area, the HRG survey will consist of a 2D or 3D UHRS survey acquired within the Lease Area (with a 500 m buffer) and along cable corridor/route center lines. This will either be acquired using a single or three 400 tip sparkers. The proposed HRG survey activities that may result in Level B take include the following:

- Medium penetration SBP (sparker) to map deeper subsurface stratigraphy as needed (soils down to at least 100 m [328 ft] below seabed in sand and at least 125 m [410 ft] below seabed in mixed sediments).

The HRG survey equipment operating at frequencies below 180 kHz (as described in Section **Error! Reference source not found.**) proposed for use in the Survey Area will be similar to the HRG survey equipment used to support other offshore wind development projects along the Atlantic Coast that have been previously approved by both NMFS and BOEM.

1.1.3 Survey Equipment

HRG survey equipment proposed includes multibeam echosounder operating at frequencies above 180 kHz, and medium sub-bottom profilers (sparkers) operating at frequencies below 180 kHz. The same equipment is proposed for use over the entire Survey Area (Table 1-1; Appendix A). The surveys will be conducted with either a single sparker or a three sparker array operating at frequencies below 180 kHz.

Table 1-1 Proposed Acoustic Equipment operating at frequencies below 180 kHz for HRG Surveys within the Survey Area

Equipment Type	Equipment Make/Model	Operating Frequency (kHz)	Source Level (SPL dB re 1 µPa @1m)	Source Level (Peak dB re 1 µPa @1m)	Sound Exposure Level (dB re 1µPa^2·s	Reference for Source Level	Pulse Duration (milliseconds)	Repetition Rate (Hz)	Beam Width (degrees)
Medium SBP (2D or 3D UHRS option)	Geo-Source 200 - 400 Marine multi-tip sparker system* (400 tip/300 - 1000J)	0.1–4.0	203	211	174	Crocker and Fratantonio 2016§	1.1	4	180
Medium SBP (2D or 3D UHRS option)	Applied Acoustics Dura-Spark UHD 400+400 (400 tip/300 - 1000J)	0.3–1.2	203	211	174	Crocker and Fratantonio 2016§	1.1	4	180

Notes:
*Although the Geo-Source system can operate with 200 tips, Community Offshore Wind proposes to use only 400 tips
§ Applied Acoustics Dura-spark 500 J to 2,000 J Proxy

Key:
NR – Not reported
Hz – Hertz
µPa – MicroPascal
dB – Decibel
m – Meters
SBP – Sub-bottom profiler
kHz – Kilohertz
SPL – sound pressure level
re – referenced to
s – Seconds

1.1.4 Acoustic Thresholds

Both NMFS and BOEM have advised that sound producing survey equipment operating below 180 kilohertz (kHz) has the potential to cause acoustic harassment to marine mammals. Under the MMPA, Level A Harassment is statutorily defined as any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild. Level B harassment is defined as any 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. The actionable sound pressure levels are not identified in the statute. NMFS (2018) guidance indicates that Level A harassment is considered to potentially occur as a result of exposure to high sound levels and the onset of permanent hearing sensitivity loss, known as a permanent threshold shift (PTS). NMFS has defined PTS for five distinct marine mammal hearing groups: Low-frequency cetaceans (LF; baleen whales), Mid-frequency cetaceans (MF; dolphins, toothed whales, beaked whales, bottlenose whales), High-frequency cetaceans (HF; true porpoises, *Kogia*, river dolphins, cephalorhynchid, *Lagenorhynchus cruciger*, and *L. australis*), Phocid pinnipeds in water (PW; true seals), and Otariid pinnipeds in water (sea lions and fur seals). Otariids are not discussed further as there are no Otariid pinnipeds in the Survey Area. PTS levels for each of these hearing groups for both impulsive and non-impulsive sound, as defined by NMFS (2018), are shown in Table 1-2.

Table 1-2 M-Weighted PTS Criteria and Functional Hearing Range for Marine Mammals likely to occur in the Survey Area

Functional Hearing Group	PTS Onset Impulsive	PTS Onset Non-Impulsive	Functional Hearing Range
LF (Baleen Whales)	$L_{p,0\text{-}pk,flat}$: 219 dB $L_{E,p,\ LF,24h}$: 183 dB	$L_{E,p,\ LF,24h}$: 199 dB	7 Hz to 35 kHz
MF (Dolphins, Toothed Whales, Beaked Whales)	$L_{p,0\text{-}pk,flat}$: 230 $L_{E,p,\ MF,24h}$:185 dB	$L_{E,p,\ MF,24h}$: 198 dB	150 Hz to 160 kHz
HF (Harbor Porpoise)	$L_{p,0\text{-}pk,flat}$:202 dB $L_{E,p,\ HF,24h}$: 155 dB	$L_{E,p,\ HF,24h}$: 173 dB	275 Hz to 160 kHz
PW (Harbor and Gray Seals)	$L_{p,0\text{-}pk,flat}$: 218 dB $L_{E,p,\ PW,24h}$: 85 dB	$L_{E,p,\ PW,24h}$: 201 dB	50 Hz to 86 kHz

Sources: (NMFS 2016, 2018)

Key:

PTS – Permanent Threshold Shift

dB – decibel

Hz – hertz

kHz – kilohertz

LF – Low frequency cetaceans

HF – High frequency cetaceans

24h – Accumulation period of 24 hours

PW – Phocid pinnipeds in water

$L_{p,0\text{-}pk}$ – Peak sound pressure level with reference value of 1 µPa

$L_{E,p}$ – Weighted cumulative sound exposure level with reference value of 1µPa^{2}s

MFC – Mid frequency cetaceans

Flat – peak sound pressures flat weighted or unweighted within generalized hearing range

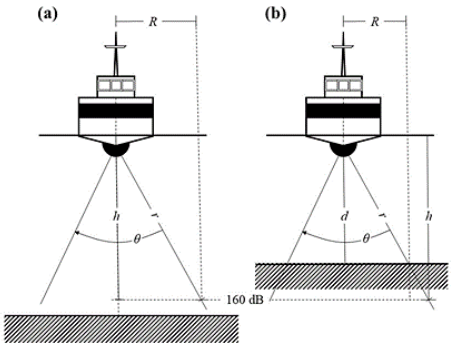
1.1.5 Distance to Level A and B Isopleths

Survey equipment operating below 180 kHz is considered to have the potential to cause Level A and/or Level B acoustic harassment to marine mammals. Therefore, only the sparkers are treated as having the potential to cause injury or harassment to marine mammals. The sound propagation modeling recommendations of NMFS (2020a) were used to calculate the distance to the Level B threshold of 160 dB SPL:

$$TL = 20log_{10}(\mathrm{r}) + {}^{a \cdot r}/_{1000}\,(dB)$$

$$a = 0.000339f^2 + 48.5\frac{f^2}{f^2 + 5715.36}\left({}^{dB}/_{km}\right)$$

where TL is transmission loss, r is the distance to threshold, a is the frequency-dependent absorption coefficient, and f is frequency (Hz). NMFS (2020a) further recommends accounting for beam angle using the following relationships (Figure 1-2):



Note: a) shows the case where depth d is greater than the vertical component of slant distance h. (b) shows the case where depth d is less than distance h.

Figure 1-2 Schematic diagrams showing horizontal impact distance R in relation to beamwidth θ when the beam is pointed downward

$$h = r\,cos\left(\frac{\theta}{2}\right)$$

$$R = \frac{d\ or\ h\ (smaller\ value)}{tan\left(\varphi - \frac{\theta}{2}\right)}$$

Where d is depth in meters and h is the vertical component of the slant distance in meters, the smaller of the two values is used in the calculation (Figure 1-2). Θ is the beamwidth in radians, φ is the beam angle from the surface (i.e., it will be 90° for sources pointing straight down), and R is the horizontal distance to the Level B threshold. Water depth in the Survey Area does not exceed approximately 51 m; Community Offshore Wind used 60 m in the calculations. Table 1-3 shows the resulting r and R values for the SBP specifications in Appendix A and Table 1-1.

The calculations conducted to estimate distances to Level A thresholds are included in Appendix B and were derived using the NMFS User Spreadsheet (NMFS 2020b) and gear specifications (Table 1-1). If needed, SEL values were calculated as SPL+10log10(T/1 second) dB, where T is the pulse duration.

NMFS recommends using the source levels reported in Crocker and Fratantonio (2016) where feasible. The source levels of the Applied Acoustics Dura-Spark reported in Crocker and Fratantonio (2016) were used as a proxy for the Geo-Source 200 – 400 sparker (proposed source will use 400 tips, not 200 tips). Of the sparker SBPs reviewed in Crocker and Fratantonio (2016), this one is the closest match to the Geo-Source 200 – 400 sparker because of the similarities in specifications and operation, with both employing up to 400 electrode tips (Appendix A and Section 3.1.2.2 of Crocker and Fratantonio 2016). Table 10 in Crocker and Fratantonio (2016) provides the measured source levels and pulse widths for the Applied Acoustics Dura-Spark with 400 electrode tips and settings for 500, 2,000, and 2,400 J. A setting of up to 1000 J is anticipated for the proposed surveys and therefore the source level values for 500 J are provided in Table 10 of Crocker and Fratantonio (2016; Table 1-3) as this setting is anticipated to be more representative of the application of this equipment than the next level reported for 2,000 J.

Table 1-3 Level A and Level B threshold distances for the proposed SBPs.

Equipment Make/Model	Distance to 160 dB SPL (m)	Horizontal Distance to 160 dB SPL (m)	Distance to Level A Isopleth (m)				Distance to Level B Isopleth (m)
			Low Frequency	Mid Frequency	High Frequency	Pinnipeds	All
Applied Acoustics Dura-Spark UHD 400+400 (400 tip/300 - 1000J)	141	141	0.8	0.0	2.8*	0.1	141
Geo-Source 200 - 400 Marine multi-tip sparker system (400 tips/300-600J)	141	141	0.8	0.0	2.8*	0.1	141

Note:

*Level A distances are based on the cumulative sound threshold unless denoted with *, in which case it is based on the peak sound threshold (higher of the two values is shown). These outputs from NMFS spreadsheet are shown in Appendix B.

Key:

m – Meters

dB – Decibels

J – Joules

SPL – sound pressure level

For the estimation of take, two configurations of the sparker (either Geo-Source 200 - 400 or Applied Acoustics Dura-Spark UHD with 400 tips) were considered for both the Lease Area survey and the ECR area survey.

Due to the short distances from the source equipment to the Level B threshold level of 160 dB SPL, implementation of mitigation and monitoring measures detailed in Section 11, in combination with the behavior of marine mammal species (i.e., their transient nature and their ability to move away from the source of potential harassment), it is unlikely HRG survey equipment will result in the Level A harassment of marine mammals. Therefore, Level A take has not been requested for any marine mammal species. Community Offshore Wind is requesting authorization for the incidental take of small numbers of marine mammals within the Survey Area by Level B harassment. Estimates of Level B take are further detailed in Section 6.

Both 2D and 3D UHRS sparker surveys were assessed for use in the Lease Area and ECR Area and either a Geo-Source 200 – 400 (with 400 tips) or Applied Acoustics Dura-Spark UHD 400+400 sparker will be used. In a three sparker array configuration, each sparker is activated sequentially 750 ms apart. The sparkers would be

physically spaced between 15.5 m to 16.7 m apart for the Geo-Source or Dura-Spark, respectively, for a total spread of 31 m for the Geo-Source 3D UHRS to 33.4 m for the Dura-Spark 3D UHRS.

The tracklines would have a total estimated survey distance of 5,370 km in the Lease Area under the 2D scenario and 28,290 km in the Lease Area under the 3D scenario and 2,177 km in the ECR Area for either 2D or 3D survey. Up to two vessels may support the offshore survey simultaneously (in the Lease Area and ECR Area). A third vessel may be used simultaneously for shallow, nearshore work (this vessel would operate for 12-hr periods rather than 24-hr periods). Thus, up to three vessels may be operating simultaneously under both scenarios. A separation distance between vessels will be agreed with BOEM in collaboration with NMFS under ESA consultation as part of the BOEM survey authorization, as applicable. Vessels will be in communication with each other and with Community Offshore Wind managers onshore via radios and typical offshore communications systems.

The final survey method has not been selected, however, in order to ensure a permit can be secured in time for planned surveys, a permit application that accounts for both options must be submitted at this time. Because either method may be used, Community Offshore Wind is requesting incidental take authorization to cover both options by basing the analysis on the equipment that would result in the largest Harassment Zone. The analysis of the Harassment Zones for both the single sparker and three-sparker configurations are shown below in Section 6.1.1.

2 Dates, Duration, and Specific Geographic Region

2.1 Dates and Durations of Survey Activities

Community Offshore Wind is requesting a start date of June 1, 2023 for the IHA. The time period of the survey is within the one-year IHA authorization term inclusive of active geophysical survey days as well as deployment, transit between survey area and port, crew changes, weather delays, and mechanical issues. It is understood the IHA authorization may be eligible for a one-time, one-year renewal for qualified activities subject to the authorization of an IHA renewal request prepared in accordance with renewal conditions and processes. An Alternative Monitoring Plan (AMP) will be submitted to BOEM as a part of the survey plan as required for night and low-visibility operations (see Section 11 for more information).

A survey day is defined here as a 24-hour survey period in which an assumed maximum of 170 km (survey speed approximately 3.8 knots [kts] or 7 km/hour) of trackline are surveyed. The 170 km is the maximum survey distance per day (3.8 kts = 7 km/h; 7km/hr*24hr = 168 km which was rounded to 170 km). This calculation does not affect the take estimate, which is based on total trackline length, not takes per day.

As noted in Section 1.1.5, two scenarios for the use of the sparker equipment (2D or 3D UHRS) are being considered for the both the Lease Area (plus a 500 m buffer) and ECR Area surveys. For the 2D Lease Area survey option, approximately 17 weeks acquisition time is estimated (considering potential down time for weather, equipment issues, mitigation, etc.) with approximately 60 days of active data acquisition with the sparker equipment. In total there are 5,370 km of trackline for this scenario. The 2D scenario would be expected to occur from June 1, 2023, until approximately September 28, 2023.

For the UHRS 3D survey scenario in the Lease Area, approximately 41 weeks acquisition time is estimated (considering potential down time for weather, equipment issues, mitigation, etc.) with approximately 248 vessel days of active data acquisition with the sparker array. In total, there would be 28,290 km of trackline for this scenario. This scenario would result in higher resolution data that could minimize the need for additional infill surveys. This is the reason for the longer trackline length for this option. The 3D survey would be expected to occur from June 1, 2023, until approximately March 12, 2024.

The ECR Area is shown in Figure 1-1. Out of a total estimated 2,177 km of 2D or 3D UHRS survey trackline in the ECR Area, Community Offshore Wind proposes to conduct an estimated 400 km of trackline in water less than 20 m deep. This represents the amount of activity in the area where the Western North Atlantic Migratory Coastal Stock (Coastal Stock) of bottlenose dolphins may be present, whereas the remaining 1,777 km is in the area where the Western North Atlantic Offshore Stock (Offshore Stock) of bottlenose dolphins may be present. Vessel speed will be approximately 3.8 kts (7 km/hour), and Community Offshore Wind anticipates approximately 45 survey days using the equipment specified in Table 1-1 over the period of approximately eight to ten weeks. The expected survey dates for the ECR area are June 1, 2023 until August 15, 2023, with either a single sparker or a three sparker array as described above for the Lease Area survey.

With respect to the ECR survey, COSW is planning to cover most of the cable routes with the Lease Area survey vessel. The ECR survey is expected to be conducted as part of lease area “downtime” and could occur when the vessel comes into port or may otherwise be transiting through the cable areas. However, if this is not feasible, a maximum case scenario is to have the vessel complete acquisition in the Lease Area followed by the survey in the ECR Area (estimated period of June 1, 2023 to May 21, 2024 for all surveys). The ECR Area survey data may be acquired using either a three sparker array or one sparker (e.g., with only the center sparker

operating and the two sparkers on either side inactive). Regardless whether a one-sparker or three-sparker acquisition approach is used, the survey is expected to be completed within the one-year period of the IHA. The exact completion date within the year is still uncertain at this time, though Community Offshore Wind has provided a best estimate of survey dates above and in Section 1.1.

2.2 Specified Geographic Region

HRG survey activities are planned to occur in the both the Lease Area and ECR Area (Figure 1-1). The Lease Area (plus a 500 m buffer [Figure 2-1]) survey is in federal waters located between 30 m and 51 m water depth. The ECR Area spans from 65 m depth to 3 m depth in the area shown in Figure 2-1. As described above, estimated trackline length for the Lease Area survey will be up to 28,290 km. Estimated trackline length for the ECR survey is up to 2,177 km .

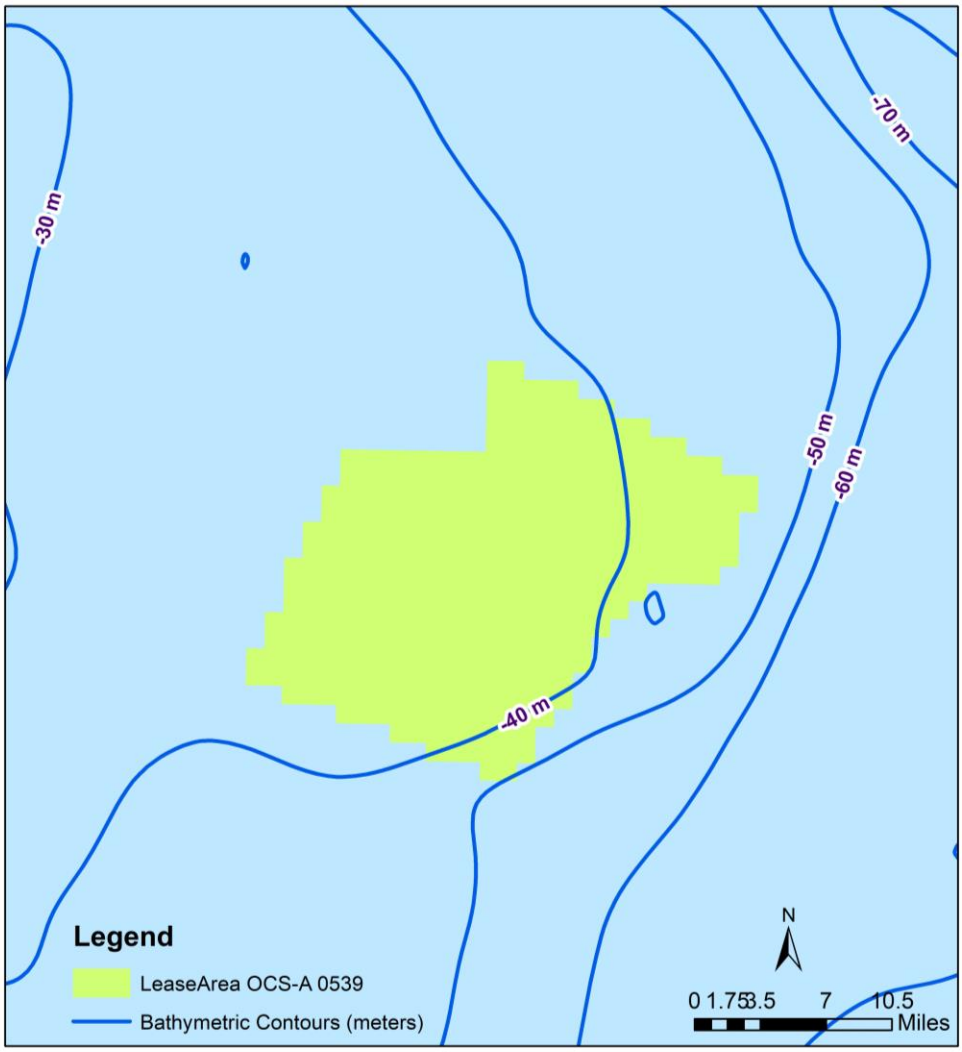


Figure 2-1 Lease Area OCS-A 0539 with bathymetric contours (MarineCadastre.gov) showing water depth

3 Species and Numbers of Marine Mammals

Marine mammals are protected under the MMPA. BOEM (2016, 2021) and Hayes et al. (2022) report 28 (including four species of *Mesoplodon* beaked whales) species/guilds of marine mammals (whales, dolphins, porpoises, and seals) in the Northwest Atlantic OCS region of the mid-Atlantic that are protected by the MMPA. The relative likelihood of the 28 species of marine mammals to occur in or transit near the Survey Area are defined as follows:

- Common – occurring consistently in moderate to large numbers;
- Regular – occurring regularly, inhabitants at least seasonally and have been documented within the Survey Area;
- Uncommon – occurring in low numbers or on an irregular basis;
- Rare – records for some years but limited; and
- Not expected – range includes the Survey Area but due to habitat preferences and distribution information, species are not expected to occur in the Survey Area although records may exist for adjacent waters.

Status, stock identification, abundance, and occurrence of these species are listed in Table 3-1 and each species/stock that is considered common, regular, or uncommon is discussed in detail in Section 4.

Five whale species of the 28 species protected under MMPA are listed as endangered under the ESA and are known to be present, at least seasonally, in the Survey Area (Table 3-1). These include:

- Fin whale (*Balaenoptera physalus*);
- Sei whale (*Balaenoptera borealis*);
- Blue whale (*Balaenoptera musculus*);
- North Atlantic right whale (*Eubalaena glacialis*); and
- Sperm whale (*Physeter macrocephalus*).

Table 3-1 Marine mammals known to occur in or near the Survey Area

Common Name	Scientific Name	Stock	Federal ESA/MMPA Status	Relative Occurrence in the Region	Abundance (Stock Assessment Report)	Abundance (Roberts et al. 2016, 2022)*
Fin Whale	*Balaenoptera physalus*	Western North Atlantic	ESA Endangered/ MMPA Depleted and Strategic	Common	6,802	4,387 (MM)
Sei Whale	*Balaenoptera borealis*	Nova Scotia	ESA Endangered/ MMPA Depleted and Strategic	Regular	6,292	2,010 (SM)
Minke Whale	*Balaenoptera acutorostrata*	Canadian East Coast	MMPA Non-Strategic	Common	21,968	5,154 (MA)
Blue Whale	*Balaenoptera musculus*	Western North Atlantic	ESA Endangered/ MMPA Depleted and Strategic	Rare	402 (minimum abundance)	33 (MA)
Humpback Whale	*Megaptera novaeangliae*	Gulf of Maine	MMPA Non-Strategic	Common	1,396 (ESA West Indies DPS estimate 11,570 1992/1993 [Bettridge et al 2015; Stevick et al. 2003])	366 (MM)
North Atlantic Right Whale	*Eubalaena glacialis*	Western North Atlantic	ESA Endangered/ MMPA Depleted and Strategic	Common	368	418 (MM)
Sperm Whale	*Physeter macrocephalus*	North Atlantic	ESA Endangered/ MMPA Depleted and Strategic	Common	4,349 (North Atlantic estimate 11,185 based on 2001 surveys [Gunnlaugsson et al. 2009])	6,856 (MM)
Dwarf Sperm Whale	*Kogia sima*	Western North Atlantic	MMPA Non-Strategic	Rare	7,750†	7,980 (MA)
Pygmy Sperm Whale	*Kogia breviceps*	Western North Atlantic	MMPA Non-Strategic	Rare		
Killer Whale	*Orcinus orca*	Western North Atlantic	MMPA Non-Strategic	Rare	Unknown	73 (MA)

Common Name	Scientific Name	Stock	Federal ESA/MMPA Status	Relative Occurrence in the Region	Abundance (Stock Assessment Report)	Abundance (Roberts et al. 2016, 2022)*
False Killer Whale	*Pseudorca crassidens*	Western North Atlantic	MMPA Strategic	Rare	1,791	139 (MA)
Cuvier's Beaked Whale	*Ziphius cavirostris*	Western North Atlantic	MMPA Non-Strategic	Rare	5,744	5,588 (MA)
Mesoplodont Beaked Whales	*Mesoplodon spp.*	Western North Atlantic	MMPA Depleted	Rare	10,107	6,526 (MA)
Risso's Dolphin	*Grampus griseus*	Western North Atlantic	MMPA Non-Strategic	Common	35,215	32,529 (MM)
Long-finned Pilot Whale	*Globicephala melas*	Western North Atlantic	MMPA Non-Strategic	Common	39,215	23,905‡ (MA)
Short-finned Pilot Whale	*Globicephala macrorhynchus*	Western North Atlantic	MMPA Non-Strategic	Rare	28,924	
Atlantic White-sided Dolphin	*Lagenorhynchus acutus*	Western North Atlantic	MMPA Non-Strategic	Common	93,233	79,149 (MM)
White-beaked Dolphin	*Lagenorhynchus Albirostris*	Western North Atlantic	MMPA Non-Strategic	Rare	536,016	129 (MA)
Common Dolphin	*Delphinus delphis*	Western North Atlantic	MMPA Non-Strategic	Common	172,974	177,543 (MM)
Atlantic Spotted Dolphin	*Stenella frontalis*	Western North Atlantic	MMPA Non-Strategic	Uncommon	39,921	42,495 (MM)
Pantropical Spotted Dolphin	*Stenella attenuate*	Western North Atlantic	MMPA Non-Strategic	Rare	6,593	1,403 (MA)
Striped Dolphin	*Stenella coeruleoalba*	Western North Atlantic	MMPA Non-Strategic	Rare	67,036	54,707 (MA)
Common Bottlenose Dolphin	*Tursiops truncatus*	Western North Atlantic, Offshore	MMPA Non-Strategic	Common	62,851	78,974 (MM) §

Common Name	Scientific Name	Stock	Federal ESA/MMPA Status	Relative Occurrence in the Region	Abundance (Stock Assessment Report)	Abundance (Roberts et al. 2016, 2022)*
		Western North Atlantic, Northern Migratory Coastal	MMPA Strategic	Common	6,639	
Harbor Porpoise	*Phocoena phocoena*	Gulf of Maine/Bay of Fundy	MMPA Non-Strategic	Common	95,543	75,951 (MM)
Harbor Seal	*Phoca vitulina*	Western North Atlantic	MMPA Non-Strategic	Regular	61,336 (additional ~20,000-30,000 in Canada [DFO 2019])	59,998 (MM) ‖
Gray Seal	*Halichoerus grypus*	Western North Atlantic	MMPA Non-Strategic	Regular	27,300 (additional 424,300 in Canada [DFO 2019])	
Harp Seal	*Pagophilus groenlandica*	Western North Atlantic	MMPA Non-Strategic	Rare	7.6 million	
Hooded Seal	*Cystophora cristata*	Western North Atlantic	MMPA Non-Strategic	Rare	Unknown	

Notes:

Stock Assessment Report abundance estimates are the Nest numbers from Hayes et al. (2022) unless otherwise noted. Abundance estimates are also reported from the Duke University Habitat-based Marine Mammal Density Models (https://seamap.env.duke.edu/models/Duke/EC/; Roberts et al. 2022). Where available, the highest monthly mean (MM) value from the most recent model version for each species is provided. If monthly abundance estimates were not available, the seasonal maximum (SM) or mean annual abundance (MA is provided). DPS = Distinct Population Segment. DFO=Fisheries and Oceans Canada

*Roberts et al. densities (updated in July 2022) are used for assessing density of stocks for take estimates in Section 6, so maximum abundances associated with those models are included here.

†The Stock Assessment Report and Roberts et al.'s models each combine *Kogia* spp. into a single estimated abundance.

‡Roberts et al. does not distinguish between short-finned and long-finned pilot whales in their density models. Long-finned pilot whales are the most likely species to be present in the region of the proposed survey.

§Only the Western North Atlantic Offshore Stock would be expected to be present in the Lease Area, where all water depths are greater than 20 m. The Western North Atlantic Migratory and Offshore Stocks would be expected to occur in the ECR Area. Roberts et al. does not distinguish between the Western North Atlantic Migratory Coastal and Western North Atlantic Offshore bottlenose dolphin stocks density models.

‖Roberts et al. does not distinguish between seal species in their density models. Harbor seals and gray seals are the most likely species to be present in the region and their density and abundance estimates primarily represent these species.

4 Affected Species Status and Distribution

Of the 28 marine mammal species described in Section 3, (Table 3-1), 15 species/guilds (16 stocks) can be reasonably expected to reside, traverse, or occasionally visit the Survey Area and may be potentially affected.

Potentially affected species are those that have a common, uncommon, or regular relative occurrence in the Survey Area (Table 3-1) or have a very wide distribution with limited distribution or abundance details. Species that are rare or not expected are not carried forward in this application. Short-finned pilot whales are not anticipated in the proposed Survey Area. Therefore, Community Offshore Wind requests an IHA for Level B disturbance for 16 stocks (15 species) listed below and described in the following sections:

- North Atlantic right whale (*Eubalaena glacialis*);
- Humpback whale (*Megaptera novaeangliae*);
- Fin whale (*Balaenoptera physalus*);
- Sei whale (*Balaenoptera borealis*);
- Minke whale (*Balaenoptera acutorostrata*);
- Sperm whale (*Physeter microcephalus*);
- Risso's dolphin (*Grampus griseus*);
- Long-finned pilot whale (*Globicephala melas*);
- Atlantic white-sided dolphin (*Lagenorhynchus acutus*);
- Common dolphin (*Delphinus delphis*);
- Atlantic spotted dolphin (*Stenella frontalis*);
- Common bottlenose dolphin (*Tursiops truncatus*), Western North Atlantic Offshore Stock;
- Common bottlenose dolphin (*Tursiops truncatus*), Western North Atlantic Migratory Coastal Stock;
- Harbor porpoise (*Phocoena phocoena*);
- Harbor seal (*Phoca vitulina*); and
- Gray seal (*Halichoerus grypus*).

Three recent IHA applications (Equinor 2020; Orsted 2020; Attentive Energy 2022) were submitted to NMFS to conduct similar HRG surveys for offshore wind development in the New York Bight. These applications include the same type of project (offshore wind facilities) within a similar geographic location as the Project. Therefore, this IHA incorporates by reference species-specific information on the status and distribution of the potentially affected species from the Equinor (2020), Orsted (2020), and Attentive Energy (2022) IHA applications (Section 4, Affected Species Status and Distribution, of the IHA applications).

Below, brief summaries of the information in Equinor (2020), Orsted (2020), and Attentive Energy (2022) are presented and supplemented with new information as appropriate. The Attentive Energy (2022) IHA application addresses the newest information specific to the distribution and densities of large whales (North Atlantic right whales, humpback whales, fin whales, sei whales and sperm whales) in the New York Bight (Normandeau Associates and APEM 2020, Zoidis et al. 2021), and those findings are summarized here as well. Local densities (not corrected for probability of detection) have been assessed by Normandeau Associates and APEM (2020), without differentiation within the New York Bight lease areas. The corrected local densities estimated by Zoidis et al (2021) have been incorporated into the current version of the Roberts et al. (2022) density models which

were applied to Community Offshore Wind's current application (retrieved from https://seamap.env.duke.edu/models/Duke/EC/ which states models were updated June 20, 2022).

4.1 Mysticetes

4.1.1 North Atlantic Right Whale (*Eubalaena glacialis*) – Endangered, Strategic

Status and distribution for the North Atlantic right whale is based on information included in Equinor (2020) (Section 4.1.1; pg. 21; Orsted (2020; pg. 21; Section 4.1.1; Attentive Energy (2022; Section 4.1.1; pg. 28), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: North Atlantic right whales are listed as endangered under the ESA and are considered a depleted and strategic stock under the MMPA (Hayes et al. 2022). This species is considered one of the most endangered large whale species in the world (Jefferson et al. 2011). The latest North Atlantic right whale Annual Report Card was developed by the North Atlantic Right Whale Consortium based on data from 1990-2020 (Pettis et al. 2022). In past reports multiple methods were used to generate estimates, but as of the 2021 report card, only one method will be used: the Pace et al. model (Pace et al. 2017). The Pace et al. (2017) model has been determined to be the most accurate method, and the 2020 estimate is 336 whales, which represents an 8% decline from the 2019 estimate. The population has been considered in decline with 40 calves born since 2017 and an unusual mortality event affecting whales since 2017. Major threats to the species include incidental fishery entanglement and ship strikes.

Distribution: North Atlantic right whales are observed year-round in the Mid-Atlantic Bight, but some whales are also observed migrating seasonally between the waters off New England in the spring/summer to feed on copepods and zooplankton and in the fall, some whales are observed traveling south to their breeding and calving grounds off South Carolina, Georgia and northeastern Florida. Two Critical Habitats important for feeding, nursery, and calving habitat have been designated for this species in the Gulf of Maine/Georges Bank (feeding) and from North Carolina to Florida (migration and calving). Additionally, to reduce ship strikes, Seasonal Management Areas (SMAs) have been designated both in the U.S. and Canada where vessels greater than 19.8 m (65 ft) in length are required to operate at speeds below 10 kts within these areas from November 1 to April 30.

New Information: As described in Attentive Energy (2022), recent work on cryptic mortality in this species has indicated that the total mortality would likely be 2.8 times the number of detected carcasses (based on 1990-2017 data) and that cryptic (or not documented) deaths were almost twice as likely to be due to entanglement than estimations derived from carcasses (Pace et al. 2021). As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-1), and North Atlantic right whales were observed both in winter and spring. Whales preferred deeper waters near the shelf break, but North Atlantic right whales were observed throughout the New York Offshore planning area. Similarly, in the New York Bight, an array of passive acoustic monitoring stations from 2018 to 2020 detected North Atlantic right whales throughout the year (Estabrook et al. 2021). Seasonally, North Atlantic right whale presence was highest in the fall, followed by spring, summer, and winter in that order. Zoidis et al. (2021) conducted aerial whale surveys in the New York Bight from 2017 to 2020. During this time, 15 North Atlantic right whale groups (24 individuals) were observed in depths ranging from 33 to 1,041 m (Figure 4-2). The uncorrected sightings rate was 0.17 whales per 1,000 km of effort. Within the New York Bight, Cornell University has been conducting passive acoustic recording to identify spatial and temporal trends in occupancy of large whales (Estabrook et al. 2020). Figure 4-1 shows the results of two years of this

study for the six focal species (see Figure 13 of Estabrook et al. 2020). Right whales can be anticipated to occur in the area year-round but with lower levels from July to September. Figure 4-2 shows the spatial and temporal acoustic detections of North Atlantic right whales in the New York Bight (see Figure 16 in Estabrook et al. 2020).

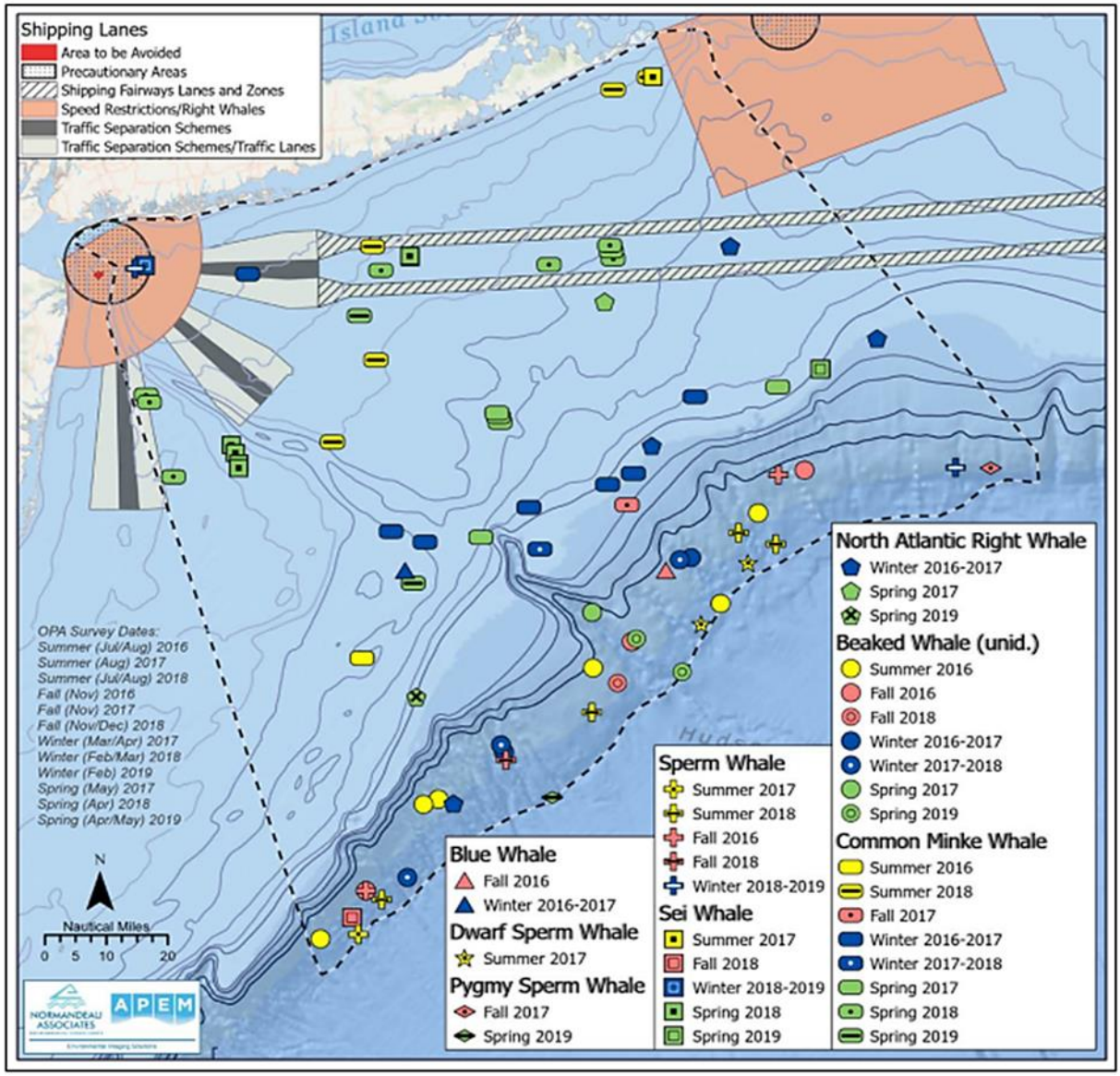


Figure 4-1 Distribution of North Atlantic Right Whale, Beaked Whale, Minke Whale, Sperm Whale, Sei Whale, Blue Whale, Dwarf Sperm Whale, and Pygmy Sperm Whale sightings during the Summer 2016 to Spring 2019 Digital Aerial Surveys of Normandeau Associates and APEM (2020).

Source: Figure 78 in Normandeau Associates and APEM (2020)

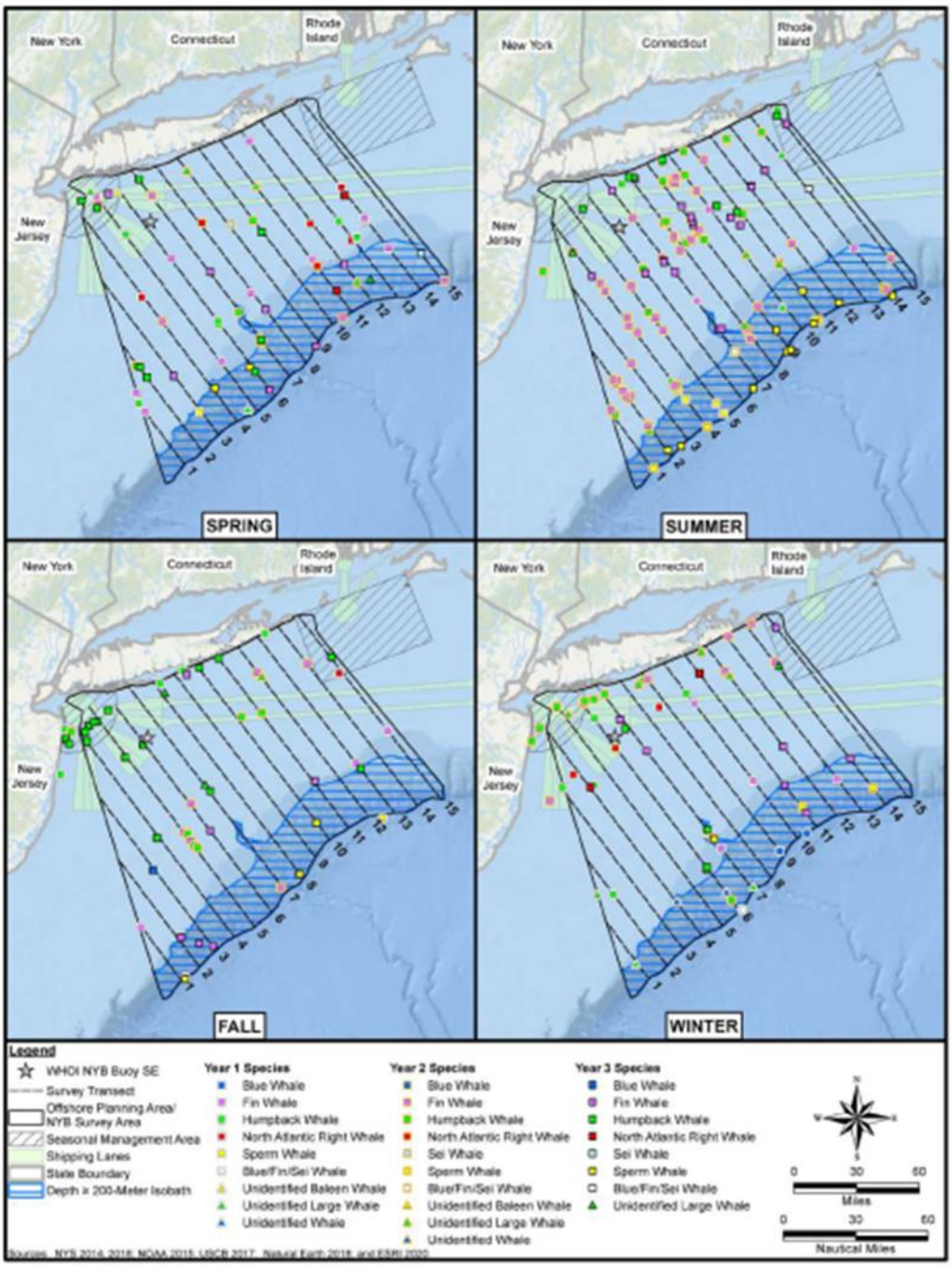


Figure 4-2 Location of large whale sightings in New York Bight surveys conducted from March 2017 to February 2020 by Zoidis et al. (2021).

Source: Figure 3 in Zoidis et al. (2021)

4.1.2 Humpback Whale (*Megaptera novaeangliae*) – Non-strategic

Status and distribution for the humpback whale is based on information included in Equinor (2020; Section 4.1.2; pg. 25), Orsted (2020; Section 4.1.2; pg. 23), and Attentive Energy (2022; Section 4.1.2, pg. 32), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: Humpback whales in this area are associated with the Gulf of Maine stock which is a primary feeding ground for the West Indies Distinct Population Segment (DPS) under ESA (DPS not listed) of this migratory species. Most of these whales migrate to their breeding and calving grounds in the Caribbean and West Indies in the winter. This stock is currently not listed as endangered under the ESA and is considered non-strategic under the MMPA. The most recent abundance estimate (Hayes et al. 2022) was about 1,396 individuals (Table 3-1) in this feeding stock. Another feeding stock in Newfoundland/Labrador was estimated at 8,439, and one in Bay of Fundy/Scotian Shelf/Gulf of St. Lawrence was estimated at 1,854 in 2016 based on Canadian surveys (Lawson and Gosselin 2018). These whales are all part of the breeding population of humpbacks in the West Indies DPS, which was estimated to be 11,570 in 1992-1993 (Stevick et al. 2003, Bettridge et al. 2015).

Distribution: Generally, the distribution of this species in the Survey Area is primarily driven by prey availability such as herring, sand lance, and other small fishes (NMFS, 2020). Humpback whales in this region also follow a diel pattern in foraging behavior that correlates with the diel patterns in sand lance behavior whereby sand lance move to the surface at night and migrate to deeper waters during the day (Friedlaender et al, 2009).

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-3) and humpback whales were observed primarily in the spring and in winter, but sightings year-round have been reported to occur in that area. Whales preferred deeper waters near the shelf break, but humpbacks were observed throughout the New York Offshore planning area. Similarly, in the New York Bight, an array of passive acoustic monitoring stations from 2018 to 2020 detected humpback whales throughout the year (Estabrook et al. 2021). Seasonally, Humpback Whale presence was highest during fall and summer months. Zoidis et al. (2021) conducted aerial whale surveys in the New York Bight from 2017 to 2020. During this time, 111 humpback whale groups (279 individuals) were observed in depths ranging from 11 to 1,542 m (Figure 4-2). The uncorrected sightings rate was 1.99 whales per 1,000 km of effort.

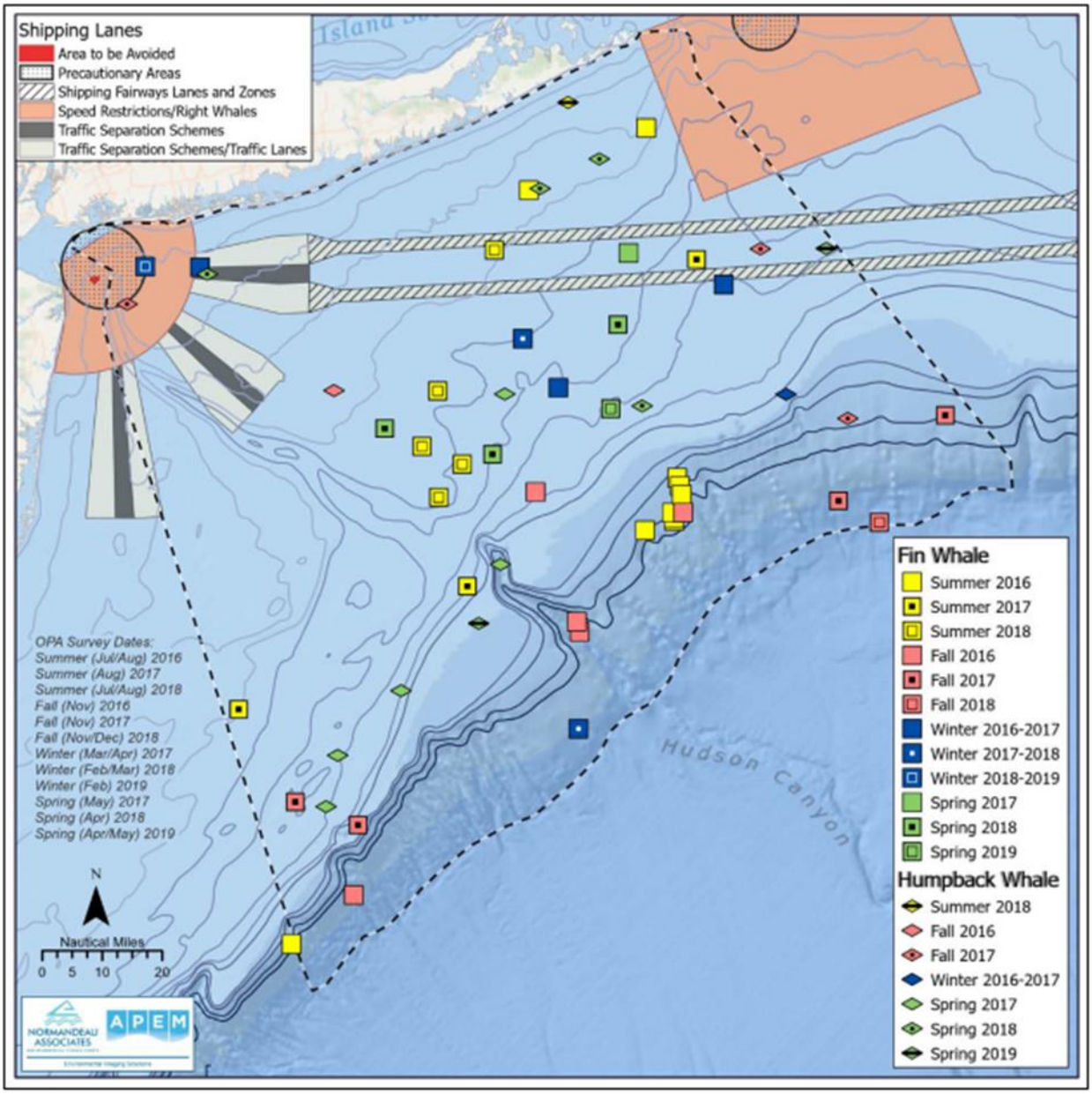


Figure 4-3 Distribution of Fin Whale and Humpback Whale sightings during the Summer 2016 to Spring 2019 Digital Aerial Surveys of Normandeau Associates and APEM (2020).

Source: Figure 77 in Normandeau Associates and APEM (2020)

4.1.3 Fin Whale (*Balaenoptera physalus*) – Endangered, Strategic

Status and distribution for the fin whale is based on information included in Equinor (2020; Section 4.1.3; pg. 26), Orsted (2020; Section 4.1.3; pg. 24), and Attentive Energy (2022; Section 4.1.3; pg.34), which are

incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: Fin whales are listed as endangered under the ESA and are considered a depleted and strategic stock under the MMPA (Hayes et al. 2022). The most recent abundance estimate (Hayes et al. 2022) for the Western North Atlantic stock was about 6,802 individuals (Table 3-1), which includes the area from Central Virginia to Newfoundland/Labrador Canada. This region is primarily a feeding ground for this migratory species that tends to calve and breed in lower latitudes or offshore. Acoustic data have indicated that a portion of the population might remain in feeding areas year around.

Distribution: There is currently no critical habitat listed for this species. Fin whale distribution tends to follow prey distribution and whales can be observed both on the continental shelf and in deeper waters. Fin whales feed primarily on sand lance, capelin, herring, copepods, euphausiids (krill) and cephalopods (e.g., squid) along the edge of the continental shelf.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area (Figure 4-3) for wind development and fin whales were observed year-round. This species was the most frequently observed mysticete species in the region across seasons, with 43 sightings over four years of surveys (next greatest number for baleen whales was 30 minke whales). Whales preferred deeper waters near the shelf break, but fin whales were observed throughout the New York Offshore planning area. Similarly, in the New York Bight, an array of passive acoustic monitoring stations from 2018 to 2020 detected fin whales throughout the year (Estabrook et al. 2021) and this was the species the most regularly detected. Seasonally, fin whales were detected more from November to January and in August/September. Zoidis et al. (2021) conducted aerial whale surveys in the New York Bight from 2017 to 2020. During this time, 124 Fin whale groups (207 individuals) were observed in depths ranging from 17 to 2,162 m (Figure 4-2). The uncorrected sightings rate was 1.47 whales per 1,000 km of effort.

4.1.4 Sei Whale (*Balaenoptera borealis*) – Endangered, Strategic

Status and distribution for the Sei whale is based on information included in Equinor (2020; Section 4.1.4; pg. 27), Orsted (2020; Section 4.1.4; pg. 25), and Attentive Energy (2022; Section 4.1.4; pg. 34), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: Sei whales are listed as endangered under the ESA and are considered a depleted and strategic stock under the MMPA (Hayes et al. 2022). The most recent abundance estimate for the Nova Scotia stock was about 6,292 individuals (Table 3-1), which includes the area from Nova Scotia Canada to Florida. Occurrence and abundance of this species in this region, which is primarily a feeding ground, vary greatly and depends on prey availability.

Distribution: There is currently no critical habitat listed for this species. Sei whale distribution in the New York Bight area tends to follow prey distribution and whales can be observed along the shelf edge continental shelf. Sei whales feed primarily on copepods, euphausiids, and occasionally fish species.

New Information: As described in Attentive Energy (2022), Normandeau Associates (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-1), and Sei whales were observed both in winter and spring in that area. Whales preferred deeper waters near the shelf break. In the New York Bight, an array of passive acoustic monitoring stations from 2018 to 2020 detected sei whales throughout the year except in January and July (Estabrook et al. 2021). The highest number of detections occurred in March and April while the fewest detections occurred in the fall. Zoidis et al. (2021) conducted aerial whale surveys in the New York Bight from 2017 to 2020. During this time, two Sei whale groups

(7 individuals) were observed in depths ranging from 60 to 381 m (Figure 4-2). The uncorrected sightings rate was 0.05 whales per 1,000 km of effort.

4.1.5 Common Minke Whale (*Balaenoptera acutorostrata*) – Non-strategic

Status and distribution for the common minke whale is based on information included in Equinor (2020; Section 4.1.5; pg. 28), Orsted (2020; Section 4.1.5; pg. 26) and Attentive Energy (2022; Section 4.1.5; pg. 35), which are incorporated herein by reference. Status and distribution information also incorporate more recent studies and surveys, as referenced in the New Information section below.

Status: Minke whales in this area are associated with the Canadian East Coast stock. This stock is currently not listed as endangered under the ESA and is considered non-strategic under the MMPA. The most recently published abundance estimate (Hayes et al. 2022) for this minke whale stock was about 21,968 individuals (Table 3-1), which includes the area from Central Virginia to Labrador Canada.

Distribution: This migratory species seems to return to its summer feeding grounds and follow the warm waters of the Gulf stream along the continental shelf. In the New York Bight, minke whales are regularly observed from April to October in coastal or continental shelf habitats where they feed on sand lance and herring.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-1). They found that minke whales were the second most commonly observed species across surveys, with the highest numbers sighted in spring months. Minke whales preferred deeper waters near the shelf break but were observed throughout the New York Offshore planning area. Zoidis et al. (2021) did not include minke whales in their study. Estabrook et al. (2021) also did not report on minke whales in their study.

4.2 Odontocetes

4.2.1 Sperm Whale (*Physeter macrocephalus*) – Endangered, Strategic

Status and distribution for the sperm whale is based on information included in Equinor (2020; Section 4.2.1; pg. 29), Orsted (2020; Section 4.2.1; pg. 27), and Attentive Energy (2022; Section 4.2.1; pg. 36, which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below. Sperm whale status was also last reviewed under ESA in 2015 (NMFS 2015).

Status: Sperm whales are listed as endangered under the ESA and are considered a strategic stock under the MMPA (Hayes et al. 2022). There are insufficient data to assess trends and abundance estimates are based on a fraction of the stock range (Table 3-1). An estimate for the North Atlantic based on 2001 surveys was 11,185 (Gunnlaugsson et al. 2009). This represents an estimate of the likely breeding population at that time; however the stock of sperm whales that is present in the US EEZ at any given time is represented by the Stock Assessment Report (Table 3-1).

Distribution: Sperm whales are found throughout the world's oceans; the North Atlantic stock is primarily found along the continental shelf edge, continental slope, and mid-ocean region; they are rarely found in waters less than 300 meters deep. In winter, North Atlantic stock sperm whales concentrate east and northeast of Cape Hatteras, moving northward in the spring and becoming widespread throughout the central Mid-Atlantic Bight and the southern Georges Bank.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-1) and sperm whales were observed in summer, fall, and winter surveys, with highest number of observations in summer. Sperm whales showed a preference for the shelf break. In the New York Bight, an array of passive acoustic monitoring stations from 2018 to 2019 detected sperm whales throughout the year; however, no sperm whales were detected in 2020 (Estabrook et al. 2021). Seasonally, sperm whales were detected more during spring and summer and least during the fall (Estabrook et al. 2021). Zoidis et al. (2021) conducted aerial whale surveys in the New York Bight from 2017 to 2020. During this time, 32 sperm whale groups (72 individuals) were observed in depths ranging from 258 to 2,265 m (Figure 4-2). The uncorrected sightings rate was 0.51 whales per 1,000 km of effort.

4.2.2 Risso's Dolphin (*Grampus griseus*) – Non-strategic

Status and distribution for the Risso's dolphin is based on information included in Equinor (2020; Section 4.2.2; pg. 30), Orsted (2020; Section 4.2.2; pg. 28), and Attentive Energy (2022; Section 4.2.2, pg. 36), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: Risso's dolphins are not listed under the ESA and are not considered a strategic stock under the MMPA (Table 3-1). The status of the Western North Atlantic stock is not well understood, and the abundance estimate was generated from shipboard surveys between Florida and Newfoundland. The current Stock Assessment Report estimated the stock to be 35,215 individuals (Hayes et al. 2022).

Distribution: Risso's dolphins are broadly distributed in tropical and temperate latitudes throughout the world's oceans. The Western North Atlantic stock occurs from Florida to eastern Newfoundland. They are common on the northwest Atlantic continental shelf in summer and fall with lower abundances in winter and spring.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-4). Risso's dolphin was the second-most common dolphin species sighted during these surveys, with the highest numbers sighted in spring and summer months. Risso's dolphins showed a preference for deeper water at the shelf break throughout the year.

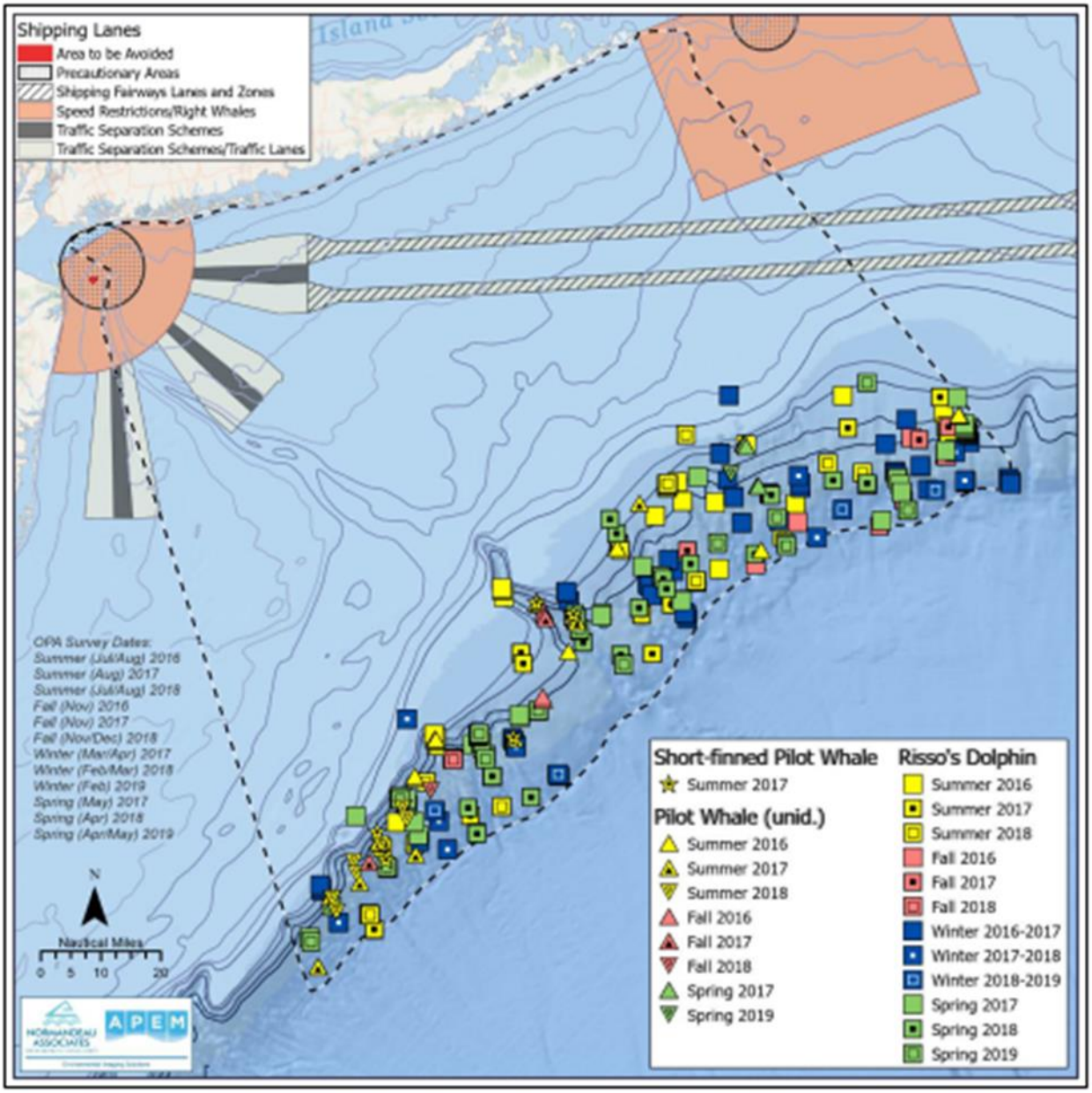


Figure 4-4 Distribution of Short-finned Pilot Whale, Unidentified Pilot Whale, and Risso's Dolphin sightings during the Summer 2016 to Spring 2019 Digital Aerial Surveys of Normandeau Associates and APEM (2020).

Source: Figure 81 in Normandeau Associates and APEM (2020)

4.2.3 Long-Finned Pilot Whale (*Globicephala melas*) - Non-strategic

Status and distribution for the long-finned pilot whale is based on information included in Equinor (2020; Section 4.2.3; pg. 30), Orsted (2020; Sections 4.2.3; pg. 28), and Attentive Energy (2022; Section 4.2.3, pg. 39), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: There are two species of pilot whales that may be found in the New York Bight; however, short-finned pilot whales are much less common at this latitude than long-finned pilot whales (Waring et al. 2015), so short-finned pilot whales are not considered likely to be taken in the proposed survey. The Western North Atlantic stock of the long-finned pilot whale (*Globicephala melas*) is not listed under ESA and is not considered a strategic stock under the MMPA (Table 3-1). The most current abundance estimate for this stock is about 39,215 individuals (Hayes et al. 2022).

Distribution: Long-finned pilot whales tend to be observed along the continental slope in winter and spring and move closer to shore within the continental shelf during the summer and fall to follow prey movement and seasonality (mackerel, cephalopods).

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-4). Short-finned pilot whales were observed in Summer 2017. Unidentified Pilot whales were primarily observed in the summer and fall and to a lesser extent in the spring. There were no sightings in the winter season across years. Pilot whales showed a preference for deeper water at the shelf break throughout the year.

4.2.4 Atlantic White-Sided Dolphin (*Lagenorhynchus acutus*) – Non-strategic

Status and distribution for the Atlantic white-sided dolphin is based on information included in Equinor (2020; Section 4.2.4; pg. 31), Orsted (2020; Section 4.2.5; pg. 30), and Attentive Energy (2022; Section 4.2.4; pg. 39), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: The Western North Atlantic stock of Atlantic white-sided dolphins is currently not listed under the ESA and is not considered strategic under the MMPA. The most recent abundance for this stock was estimated to be 93,233 individuals (Hayes et al. 2022) and there is currently no information on the population trend.

Distribution: Atlantic white-sided dolphins are primarily observed offshore on the continental shelf edge and occasionally traveling inshore where they feed on herring, smelt, and other schooling fish, particularly during fall and spring months.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-5). Atlantic white-sided dolphins were observed in the fall and winter. Atlantic white-sided dolphins showed a preference for deeper water at the shelf break throughout the year.

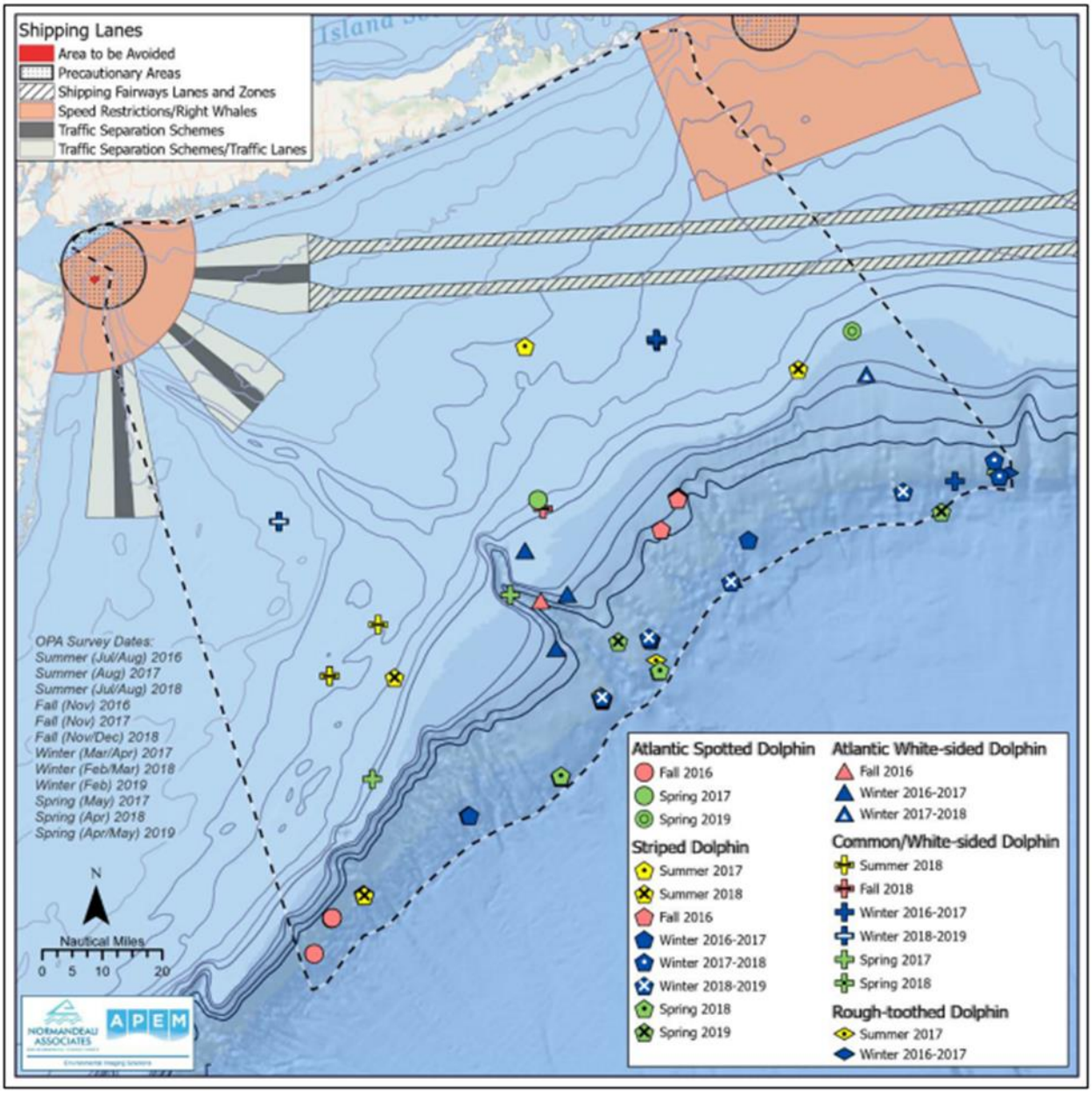


Figure 4-5 Distribution of Atlantic Spotted Dolphin, Atlantic White-sided Dolphin, Striped Dolphin, Common White-sided Dolphin, and Rough-toothed Dolphin sightings during the Summer 2016 to Spring 2019 Digital Aerial Surveys of Normandeau Associates and APEM (2020).

Source: Figure 80 in Normandeau Associates and APEM (2020)

4.2.5 Short-Beaked Common Dolphin (*Delphinus delphis*) – Non-strategic

Status and distribution for the short-beaked common dolphin is based on information included in Equinor (2020; Section 4.2.5; pg. 31), Orsted (2020; Section 4.2.6; pg. 31), and Attentive Energy (2022; Section 4.2.5; pg. 41), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: The Western North Atlantic stock of short-beaked common dolphins is currently not listed under the ESA and is not considered strategic under the MMPA. The most recent abundance for this stock was estimated to be 172,974 individuals (Hayes et al., 2022).

Distribution: Common dolphins can be observed in large groups and tend to occupy the shelf and shelf break along the Gulf Stream, but they have also been observed in coastal habitats as well as offshore waters. This species feeds primarily on small schooling fish and squid. Common dolphins are also observed migrating to mid-Atlantic waters during winter months.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-6). Common dolphins were the most frequently encountered species across seasons and years except for Summer 2016.

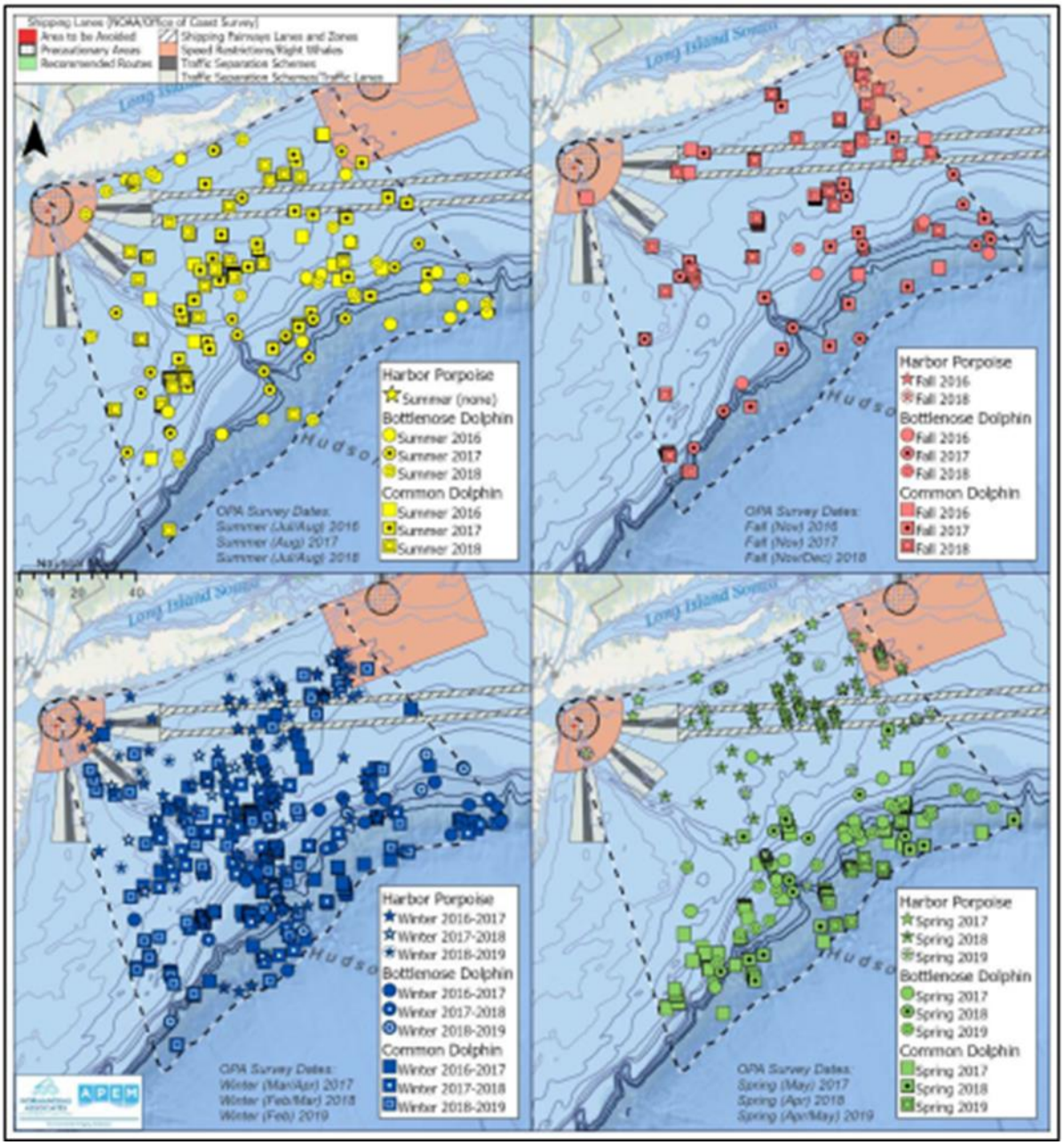


Figure 4-6 Distribution of Harbor Porpoise, Common Bottlenose Dolphin, and Short-Beaked Common Dolphin sightings during the Summer 2016 to Spring 2019 Digital Aerial Surveys of Normandeau Associates and APEM (2020).

Source: Figure 79 in Normandeau Associates and APEM (2020)

4.2.6 Common Bottlenose Dolphin (*Tursiops truncatus*) – Strategic and Non-Strategic Stocks

Status and distribution for the common bottlenose dolphin is based on information included in Equinor (2020; Section 4.2.6; pg. 32), Orsted (2020; Section 4.2.8; pg. 32), and Attentive Energy (2022; Section 4.2.6, pg. 43), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: Two stocks of bottlenose dolphins, the Western North Atlantic Northern Migratory Coastal Stock and the Western North Atlantic Offshore Stock, are likely to occur in the proposed Survey Area. These two stocks are generally considered to be geographically separated for management by the 20 m depth contour, with the Coastal Stock in <20 m and the Offshore Stock in >20 m of water. The two stocks are genetically and morphologically distinct. (Hayes et al. 2022).

The Coastal Stock is considered strategic and depleted under the MMPA but is not listed under the ESA. The most recent abundance estimate for this stock was 6,639 individuals (Hayes et al. 2022). The Offshore Stock is considered non-strategic under the MMPA and is not listed under the ESA. This stock is relatively common in the Survey Area and the most recent abundance estimate for this population was 62,851 individuals (Hayes et al. 2022). Based on the monthly abundance maps of Roberts et al. (2022), which do not differentiate the two stocks, the maximum monthly abundance of bottlenose dolphins occurs in November and is 87,249. There are not enough data to determine population trends.

Distribution: The Offshore Stock is generally observed along the outer continental shelf and slope in waters deeper than 34 m and over 34 km offshore (Torres et al. 2003). In contrast, the Coastal Stock is typically within the 34 m depth profile and 34 km range from shore. The Coastal Stock migrates south during the late summer and fall and migrates north in the colder months. The offshore boundary of the Coastal Stock is defined as the 20 m isobath in summer north of Cape Hatteras and the 200 m isobath in winter between Cape Hatteras and Cape Lookout (Hayes et al. 2022).

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-6). Bottlenose dolphins were a frequently encountered species across seasons and years. Bottlenose dolphin stock affiliation cannot be distinguished visually in surveys, so these studies do not differentiate between Coastal and Offshore Stocks.

4.2.7 Atlantic Spotted Dolphin (*Stenella frontalis*) – Non-strategic

Status and distribution for the Atlantic spotted dolphin is based on information included in Equinor (2020; Section 4.2.7; pg. 33), Orsted (2020; Section 4.2.7; pg. 32), and Attentive Energy (2022; Section 4.2.7; pg. 43), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: Atlantic spotted dolphins are relatively uncommon in the Survey Area. The Western North Atlantic stock of Atlantic spotted dolphins is currently not listed under ESA and is not considered strategic or depleted under MMPA. Current stock population trends are unknown. The most recent population abundance for this stock was estimated at 39,921 individuals (Hayes et al. 2022).

Distribution: Spotted dolphins are usually observed along the continental shelf edge and the continental slope. This species has been associated with the Gulf stream and warm-core rings (Waring et al. 2015).

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-5). Atlantic spotted dolphins were mainly observed in Fall 2016, with three additional sightings in Spring 2017. They showed a preference for deeper water at the shelf break.

4.2.8 Harbor Porpoise (*Phocoeana phocoena*) – Non-strategic

Status and distribution for the harbor porpoise is based on information included in Equinor (2020; Section 4.2.8; pg. 33) Orsted (2020; Section 4.2.9; pg. 34), and Attentive Energy (2022; Section 4.2.8; pg. 44), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: The Gulf of Maine/Bay of Fundy stock is not considered strategic or depleted under the MMPA and is not listed under the ESA. Current population trends are unknown, but the most recent abundance estimate for this stock was 95,543 individuals which includes the area from Central Virginia to Gulf of St. Lawrence/Bay of Fundy/Scotian Shelf Canada (Hayes et al. 2022).

Distribution: Harbor porpoises feed on cod, herring, and mackerel, as well as sand eels and cephalopods. This species is present in the Survey Area during fall and winter seasons (Whitt et al. 2015). They tend to occupy shallow waters in the Canada and the Gulf of Maine in summer.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development (Figure 4-6). Harbor porpoises were observed mainly in winter, followed by spring, with seven additional sightings in fall over the three-year study and no observations of harbor porpoises in summer.

4.3 Pinnipeds

4.3.1 Gray Seal (*Halichoerus grypus*) – Non-strategic

Status and distribution for the gray seal is based on information included in Equinor (2020; Section 4.3.1; pg. 34) Orsted (2020; Section 4.3.2; pg. 35), and Attentive Energy (2022; Section 4.3.1; pg. 44), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: Gray seals in the Survey Area are part of the Western North Atlantic stock which is currently not listed under the ESA and is not considered strategic or depleted under the MMPA. This species is regularly observed in the Survey Area and the most current population abundance in US waters was estimated at 27,300 individuals (Hayes et al. 2022; Table 3-1). Fisheries and Oceans Canada (DFO) estimates the part of this population to be 424,300 in Canadian waters (DFO 2017).

Distribution: Gray seals can be observed year around from Canada to Massachusetts. Some seals migrate to the waters off New York and New Jersey between the fall and spring months, with haul-outs documented in the Long Island area, (and) with a possible rookery on Little Gull Island.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development. Gray seals were only randomly encountered in the fall, winter, and spring seasons. For most of the years and seasons, this species was not encountered. Seals were difficult to identify at the species level in this study.

4.3.2 Harbor Seal (*Phoca vitulina*) – Non-strategic

Status and distribution for the harbor seal is based on information included in Equinor (2020; Section 4.3.2; pg. 35), and Orsted (2020; Section 4.3.1; pg. 35), Attentive Energy (2022; Section 4.3.2; pg. 45), which are incorporated herein by reference. Status and distribution information also incorporates more recent studies and surveys, as referenced in the New Information section below.

Status: This species is the most abundant seal in the Eastern U.S. The animals observed in Survey Area are part of the Western North Atlantic stock which is currently not listed under the ESA and is not considered strategic or depleted under the MMPA. The most recent population abundance estimated 61,336 individuals in the US (Hayes et al. 2022), and DFO estimates approximately 20,000-30,000 harbor seals in the Canadian Atlantic (DFO 2019).

Distribution: Harbor seals feed on a variety of prey and can be observed in coastal and shallow environments as well as offshore. Harbor seals undergo a seasonal migration from Eastern Canada/Maine down to the mid-Atlantic from the fall to spring months. Their numbers may be increasing in areas further south than New York, with consistent observations as far south as Eastern Shore, Virginia from November to April during surveys 2016-2018 (Jones et al. 2018). Harbor seals are the most common seal species observed by the Coastal Research and Education Society (CRESLI) in the Long Island area. The CRESLI website states that there are about 30 seal haul-out sites known on Long Island, and the organization has been collecting data on harbor seals using Cupsogue Beach for 16 years (Kopelman 2022). Harbor seals would be expected to occur offshore, nearshore, and in bays and inland waters mainly in winter.

New Information: As described in Attentive Energy (2022), Normandeau Associates and APEM (2020) conducted aerial surveys of the New York Bight offshore planning area for wind development. Harbor seals were only randomly encountered in the fall, winter, and spring seasons. For most of the years and seasons, this species was not encountered. Seals were difficult to identify to species in this study.

5 Type of Incidental Taking Authorization Requested

The exposure assessment in this IHA application quantifies potential sound exposures of marine mammals resulting from proposed HRG surveys in the marine environment (Section 6). Exposure to Level A thresholds is not anticipated and thus this application is not requesting take authorization for Level A harassment. Sound levels associated with operation of certain types of HRG survey equipment operating at frequencies below 180 kHz may result in Level B harassment as defined under the MMPA. The most likely and anticipated impact is Level B take resulting from avoidance or temporary displacement of some individuals or groups of marine mammals near the proposed activities. These are considered minor behavioral reactions.

For the proposed Lease Area survey and ECR Area survey, Community Offshore Wind requests an IHA pursuant to Section 101(a)(5)(D) of the MMPA for incidental take of small numbers of marine mammals by Level B Harassment. Mitigation and impact reduction measures to protect marine mammals are described in Section 11 and are expected to decrease the likelihood that marine mammals will be exposed to sound levels associated with Level B harassment during HRG survey activities. See Table 1-3 for distances to Level B acoustic thresholds.

6 Take Estimates for Marine Mammals

Community Offshore Wind is seeking authorization for potential takes of small numbers of marine mammals under the jurisdiction of NMFS in the Survey Area. There are 15 species/guilds (16 stocks) of marine mammals that have potential to be taken by incidental Level B harassment during the proposed HRG surveys. One of these species, the common bottlenose dolphin, is comprised of two stocks; the Western North Atlantic Offshore Stock (Offshore Stock), which is most likely to be encountered in the Lease Area and the deeper waters of the ECR Area, and the Western North Atlantic Northern Migratory Coastal (Coastal) Stock, which is most likely to be encountered in the shallow waters of the ECR Area. The 15 species are listed in Table 6-1 and detailed in Section 4.

Table 6-1 Species table

Mysticetes	Odontocetes	Pinnipeds
North Atlantic Right Whale	Sperm Whale	Gray Seal
Humpback Whale	Risso's Dolphins	Harbor Seal
Fin Whale	Long-finned Pilot Whale	
Sei Whale	Atlantic White-sided Dolphin	
Common Minke Whale	Short-beaked Common Dolphin	
	Atlantic Spotted Dolphin	
	Harbor Porpoise	
	Common Bottlenose Dolphin Western North Atlantic Offshore Stock	
	Common Bottlenose Dolphin Western North Atlantic Northern Migratory Coastal Stock	

The only anticipated potential exposures to sound levels associated with Level B take for marine mammals are related to the use of Geo-Source 200 – 400 or Applied Acoustics Dura-Spark UHD sparkers (either as a single source or in a three sparker array configuration as described in Section 1.1.3) in the Lease Area and the ECR Area. The proposed HRG survey activities are not expected to take more than a small number of marine mammals or have more than a negligible impact on marine mammals based on seasonal density and distribution and known reactions to underwater sound exposure. The survey equipment operated at frequencies below 180 kHz is listed in Section 1.1.3, acoustic thresholds are listed in Section 1.1.4, distances to level B thresholds are listed in Section 1.1.5, and species status and distributions are described in Section 4.

6.1 Take Estimation

Estimating exposures of marine mammal species assumes exposure of an animal to a specified sound level threshold within a region of ensonification will result in a take of that animal. Potential Level B take is estimated within the ensonified area as a sound pressure level exceeding 160 dB SPL re 1 µPa for non-impulsive intermittent sources (e.g., sonar, CHIRPs) and impulsive sources (e.g., sparkers, boomers). The sparker (Geo-

Source 200 – 400 or Applied Acoustics Dura-Spark UHD) has the potential to cause Level B take, so the underwater Level B harassment acoustic thresholds are applicable. The potential number of exposed animals is estimated from the maximum mean seasonal densities (animals per km^2) of a given species expected within the Survey Area based on the density models of Roberts et al. (2022). These calculations result in unmitigated take estimates for each affected stock over the survey period.

6.1.1 Level B Harassment Zone Calculation

As noted in Section 1.1.4, the Level B Harassment Zone (Harassment Zone) is the area that is ensonified to the threshold level specific for the operating characteristics of the sound sources. In this case, as the sparker is an impulsive sound source, the threshold is 160 dB SPL, and the Harassment Zone is the area of water ensonified to levels that meet or exceed 160 dB SPL. The outputs for the horizontal threshold for the sparker using the NMFS calculator are shown in Figure 6-1. To estimate the area of the Harassment Zone in the Lease Area and the ECR Area, the total estimated trackline in each area was used and buffered with the horizontal distance to the Level B threshold for both a single sparker and a three sparker UHRS survey (Table 1-3; Figure 6-2) to determine the total area ensonified to 160 dB SPL (Harassment Zone):

$$Harassment\ Zone = (L \times 2R) + \pi R^2$$

L = Trackline Length, R = Radius of distance to Level B threshold (see below for derivation of radii for 2D and 3D configurations)

The πR^2 term is the area of a circle and accounts for semi-circles at the beginning and end of the trackline.

Source Name: Geo-Source 200 – 400 Sparker

INPUT VALUES (LEVEL B)	
Threshold Level	*160*
Source Level (dB)	*203*
Frequency (kHz)	*1*
Beamwidth (degree)	*180*
Water depth (m)	*60*

COMPUTED VALUES (LEVEL B)	DO NOT CHANGE
alpha (dB/km)	0.00882342
TL coefficient	20
Slant distance of threshold (m)	141
Vertical depth of threshold (m)	8.6373E-15
Horizontal threshold range (m)	141

Source Name: Applied Acoustics Dura-Spark

INPUT VALUES (LEVEL B)	
Threshold Level	*160*
Source Level (dB)	*203*
Frequency (kHz)	*1*
Beamwidth (degree)	*180*
Water depth (m)	*60*

COMPUTED VALUES (LEVEL B)	DO NOT CHANGE
alpha (dB/km)	0.00882342
TL coefficient	20
Slant distance of threshold (m)	141
Vertical depth of threshold (m)	8.6373E-15
Horizontal threshold range (m)	141

Figure 6-1 Snapshot of Inputs and Outputs from NMFS' Level B HRG Impact Distance Calculator for 400 tips/500J. These calculations apply to both proposed sparker systems. Only 400 tips are proposed for either system.

As noted in Section 1, Community Offshore Wind is considering two scenarios for the sparker surveys in the Lease Area. For the single sparker UHRS scenario, the total survey trackline length for the Lease Area is 5,370 km. The distance to the Level B threshold is 0.141 km (Table 1-3). The Harassment Zone is therefore 1,515 km^2.

For the UHRS survey using a three sparker array with 400 tips (either Geo-Source 200 - 400 or Applied Acoustics Dura-Spark UHD) activating sequentially 750 ms apart, the Harassment Zone was modeled for each sparker as in the first scenario and allowing for up to the maximum proposed 16.7 m spacing between each sparker (Figure 6-2). The distance to the Level B threshold for both proposed sparkers is 141 m. Based on this, the distance to Level B take from the center line of the survey was estimated to be 141 m + 16.7 m = 157.7 m (equal to R in the equation above). With 28,290 km of tracklines, the Harassment Zone area is 8,923 km^2. As this area is larger than the single sparker scenario described above, take estimates were assessed based on a three sparker UHRS survey of the Lease Area.

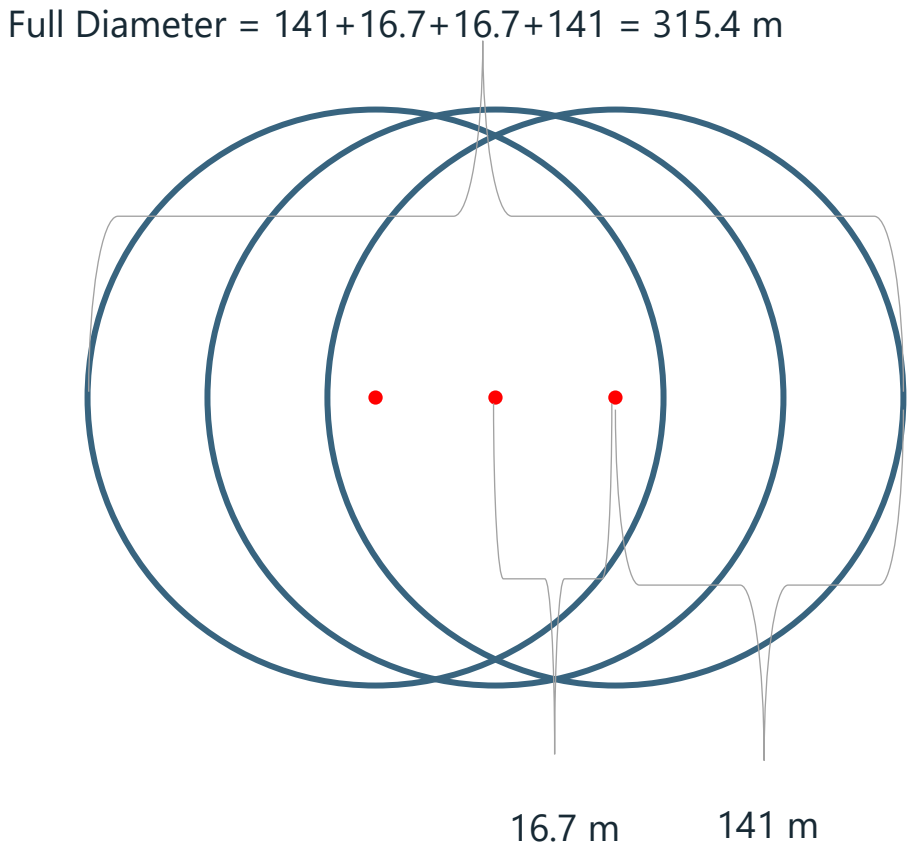


*Figure 6-2 3 sparker configuration - radius to exposure is 141 m + 16.7 m = 157.7 m from center and the full diameter is 157.7*2 = 315.4 m. Sparkers are depicted by red dots and the Harassment Zone for each sparker is the blue circle.*

For the ECR Area, 2,177 km of survey trackline is estimated for completing the survey, with an estimated 400 km in waters less than 20 m depth and the potential to take Common Bottlenose Dolphins from the Western North Atlantic Northern Migratory Coastal Stock. The distance to the Level B threshold for the sparker is 0.141 km (Table 1-3). The estimated Harassment Zone for a single sparker scenario is 615 km^2. Of that, 113 km^2 would be in waters less than 20 m. If the three sparker array is used in the ECR, the maximum-case Harassment Zone is 688 km^2 and of that 127 km^2 would be in waters less than 20 m.

As per the equation in Section 6.1.1, the Harassment Zone of the maximum case was calculated as the total survey trackline buffered with the distance to the Level B threshold, which gives an ensonified area of 8,923 km^2 for the Lease Area and 688 km^2 in the ECR area. Takes per day were not calculated but rather takes anticipated over the distance of the survey were calculated. Multiplying the ensonified area times density gives the total expected exposures for the duration of the survey, regardless of how many days the survey requires. There has not been an attempt to differentiate between individuals taken vs total exposures, so this approach conservatively assumes all exposures are different individuals. This approach will yield the same take numbers as estimating takes per day based on the amount of trackline that could be surveyed in a 24-hour day.

6.1.2 Marine Mammal Density Estimations

The density calculations for marine mammals to be used for estimating take are derived from the habitat-based density models of Roberts et al. (2016) and subsequent unpublished reports updating the earlier models (Roberts et al. 2022). The most recent model version available for each species, updated in July 2022, was utilized for this analysis (https://seamap.env.duke.edu/models/Duke/EC/). The data provided by Roberts et al. (2022) are raster files binned into 5 km x 5 km grids, and each grid square has a monthly or annual density. For all species considered in the current application, except pilot whales, there is a raster file for each month; for pilot whales there is an annual raster file.

ArcGIS (Geographic Information System; Environmental Systems Research Institute 2018) software was used to identify the grid cells from most recent models from Roberts et al. (2022) that overlapped the Lease Area and the ECR Area for each monthly raster. Figure 6-3 shows an example for the April density grid for harbor porpoise and the Lease Area where the 52 grid squares included in the density calculation are highlighted in blue. The same approach was taken with other species and with densities in the ECR Area. Densities represented by the grid squares overlapping the survey areas (Lease Area or ECR Area) were averaged to estimate the monthly density within the Lease Area and within the ECR Area for each species and then to assess maximum seasonal densities.

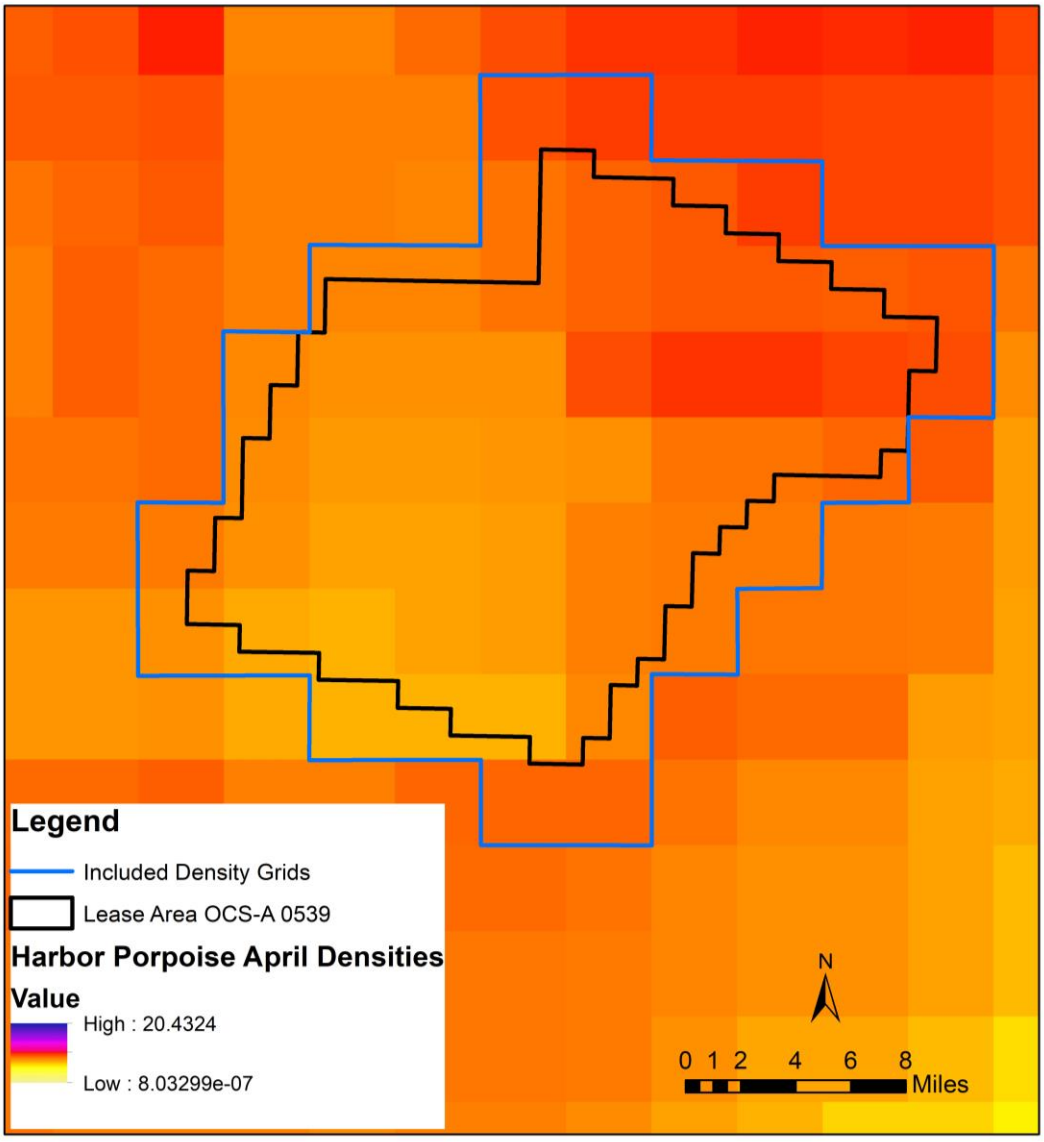


Figure 6-3 Lease Area OCS-A 0539 shown with the 5 km by 5 km Harbor Porpoise density grids overlaid.

It is anticipated the Lease Area surveys will be completed within an estimated 41-week time interval and the ECR Area surveys will be completed within 8-10 weeks, possibly with more than one vessel; however, the exact timing of the surveys during the year is not yet certain. Therefore, the monthly densities were averaged across seasons (Winter [December, January, February]; Spring [March, April, May], Summer [June, July, August] and Fall [September, October, November]) and the season with the highest density for each species (Table 6-2;

Table 6-3) was used for exposure calculations to account for the uncertainty in the timing of the surveys.

Recent IHAs for similar survey work off New York and New Jersey have observed more common dolphins than anticipated based on the Roberts et al. (2016, 2017, 2018) densities and other IHA's have used the maximum monthly density to adjust estimated take levels. However, the latest models from Roberts et al. (2022) represent substantial additional data, improved statistical methods, and increased spatial resolution for species, including common dolphins. For most species, the new models result in higher densities than the previous versions. For other species, such as harbor porpoise, where new data were not available, the new models have removed sightings at high Beaufort sea state levels, acknowledging that marine mammal sightings are reduced in these conditions and are likely biasing density estimates low, again resulting in higher densities. Given the new models and revised (i.e., higher) densities for common dolphins, the same approach has been taken as with the other species and the highest seasonal mean density was to estimate takes of common dolphins. Another substantial change in the Roberts et al. (2022) models is that the density grids are now 5 km by 5 km for all species compared to the 10 km by 10 km of the previous models for all species except North Atlantic Right Whales.

Exceptions to the above procedure for estimating densities are for bottlenose dolphins, pilot whales, and seals. There are two stocks of bottlenose dolphins that may be impacted by the surveys, the Coastal Stock found in waters less than 20 m and the Offshore Stock found in waters deeper than 20 m. The Lease Area is in waters deeper than 20 m and only the Offshore Stock will be potentially exposed to sound associated with those surveys. For the ECR, separate mean seasonal densities were calculated for the area less than 20 m and for the area greater than 20 m (Figure 1-1;

Table 6-3) to use for estimating take of the Coastal and Offshore Stocks of bottlenose dolphins, respectively.

As noted above, for long-finned pilot whales, data from Roberts et al. (2022) only provide a single raster grid containing annual density estimate for *Globicephala* species (i.e., short-finned and long-finned pilot whales combined). The annual density raster grid was used to estimate densities in the Lease Area and ECR Area and assumed densities apply only to long-finned pilot whales, as short-finned pilot whales are not anticipated to occur as far north as the Survey Area.

Seals are difficult to identify during shipboard visual surveys, given their size and behavior when in the water, therefore, there is limited information available on species-specific distribution. Density estimates of Roberts et al. (2022) included all seal species that may occur in the Western North Atlantic combined (i.e., harbor, gray, hooded, and harp). Only the harbor seals and gray seals are reasonably expected to occur commonly in the Survey Area; therefore, densities of seals were split evenly between these two species.

Table 6-2 Estimated marine mammal densities (animals per km^2) for Lease Area OCS-A 0539

Species	Spring	Summer	Fall	Winter	Monthly Max	Annual Mean
Mysticetes						
North Atlantic Right Whale	**0.002531**	0.000123	0.000278	0.002469	0.003736	0.001350
Humpback Whale	**0.004978**	0.003502	0.003361	0.002093	0.007860	0.003483
Fin Whale	**0.008236**	0.006343	0.002820	0.007178	0.009580	0.006144
Sei Whale	**0.002553**	0.000291	0.000671	0.000587	0.003147	0.001025
Common Minke Whale	**0.032014**	0.013242	0.003800	0.002770	0.054280	0.012957
Odontocetes						
Sperm Whale	0.000149	0.001164	0.000209	0.000389	0.001718	0.000478
Risso's Dolphins	0.003812	0.001989	0.002667	0.006367	**0.009125**	0.003709
Long-finned Pilot Whale						0.008626
Atlantic White-sided Dolphin	**0.045873**	0.030530	0.028408	0.038509	0.088816	0.035830
Short-beaked Common Dolphin	0.283789	0.266573	0.269957	**0.608658**	0.785056	0.357244
Atlantic Spotted Dolphin	0.003087	0.012384	**0.035251**	0.001125	0.048345	0.012962
Harbor Porpoise	**0.202503**	0.019695	0.014061	0.176183	0.295025	0.103111
Common Bottlenose Dolphin (Offshore Stock)	0.057672	0.134552	**0.135835**	0.081725	0.160867	0.102446

Species	Spring	Summer	Fall	Winter	Monthly Max	Annual Mean
Common Bottlenose Dolphin (Northern Migratory Coastal Stock)*	N/A	N/A	N/A	N/A	N/A	N/A
Pinnipeds						
Gray Seal	0.179976	0.001976	0.012599	**0.197675**	0.225447	0.098057
Harbor Seal	0.179976	0.001976	0.012599	**0.197675**	0.225447	0.098057

Notes:

Highest seasonal mean used in take estimation highlighted in bold font.

*The northern migratory coastal stock of bottlenose dolphins is mainly in <20 m of water, and the Lease Area does not include areas <20 m depth.

Table 6-3 Estimated marine mammal densities (animals per km²) for the ECR Area

Species	Spring	Summer	Fall	Winter	Monthly Max	Annual Mean
Mysticetes						
North Atlantic Right Whale	0.0013520	6.85E-05	0.000162	**0.001670**	0.002164	0.000813
Humpback Whale	0.0034680	0.001505	0.002674	**0.003529**	0.004674	0.002794
Fin Whale	0.0041390	0.003469	0.001385	**0.004728**	0.005589	0.003430
Sei Whale	**0.001717**	0.000163	0.000578	0.001030	0.002427	0.000872
Common Minke Whale	**0.025722**	0.008357	0.002026	0.001676	0.042415	0.009445
Odontocetes						
Sperm Whale	0.000159	**0.000333**	0.000137	0.000173	0.000347	0.000201
Risso's Dolphins	0.001051	0.000462	0.000982	**0.002417**	0.005406	0.001228
Long-finned Pilot Whale						**0.001781**
Atlantic White-sided Dolphin	**0.02589**	0.01209	0.018174	0.019098	0.037820	0.018813
Short-beaked Common Dolphin	0.100426	0.082612	0.144810	**0.204915**	0.320953	0.133191
Atlantic Spotted Dolphin	0.000430	0.002597	**0.007894**	0.000219	0.010873	0.002785
Harbor Porpoise	**0.151991**	0.007557	0.004378	0.143547	0.222985	0.076868
Common Bottlenose Dolphin (Offshore Stock)*	0.064494	**0.185414**	0.174053	0.071111	0.197985	0.123768
Common Bottlenose Dolphin (Northern Migratory Coastal Stock)*	0.306299	0.850814	**0.909066**	0.221774	0.989484	0.571988
Pinnipeds						
Gray Seal	**0.276996**	0.065312	0.092917	0.265287	0.329153	0.175128
Harbor Seal	**0.276996**	0.065312	0.092917	0.265287	0.329153	0.175128

Notes:

Highest seasonal mean used in take estimation highlighted in bold font.

*It was assumed that bottlenose dolphins in less than 20 m of water were part of the Coastal Stock and in greater than 20 m of water, were part of the Offshore Stock per the stock definitions in Hayes et al. (2022).

6.1.3 Marine Mammal Take Estimations

To estimate the number of potential Level B harassment takes, the Harassment Zone (km^2) is multiplied by the highest seasonal density of each species/stock (animals/km^2; annual density for pilot whales) to estimate total potential takes. In the case where estimated takes are less than a typical group size, the take estimated is rounded up to a mean group size based on Palka et al. (2017, 2021) and Cetacean and Turtle Assessment Program (CETAP 1982; see Appendix C for assessment of mean group sizes).

To understand the proportional impact on marine mammal species, the estimated take numbers were compared to abundance. The best abundance estimates would be across the full range of the species, such as some of the abundance estimates from the Stock Assessment Reports that are inclusive of animals in Canadian waters. However, lacking such estimates, abundances are best represented relative to exposure estimates based on Roberts et al. (2022) densities by the maximum estimated abundance. Although mean densities from Roberts et al. (2022) were used for estimating exposures, the fact that some individuals are not available for take during some months is realistic and does not mean abundance of the population itself should be limited to the mean or minimum monthly abundance estimates from Roberts et al (2022). Overall population abundance does not appreciably vary throughout the year even though density in individual grid cells (and thus individual availability to be exposed) does vary. Therefore, the highest abundance estimates for each species (from either Hayes et al. 2022 or the maximum monthly abundance from Roberts et al. (2022; Table 3-1) were used to estimate the percent of abundance that may potentially be taken for each species. Differences between individuals exposed and total exposures were not assessed. The estimated takes for the Lease Area and ECR area (Table 6-4) are combined for total takes requested in this application (Table 6-5).

Table 6-4 Requested Marine Mammal Level B Harassment takes for HRG surveys in the Lease Area (OCS-A-0539) and ECR Area

Species	Estimated Level B Takes - Lease Area	Estimated Level B Takes - ECR Area	Total Estimated Takes	Total Requested Takes
Mysticetes				
North Atlantic Right Whale	23	1	24	24
Humpback Whale	44	2	46	46
Fin Whale	73	3	76	76
Sei Whale	23	1	24	24
Common Minke Whale	286	18	304	304
Odontocetes				
Sperm Whale	10	0	10	10
Risso's Dolphin	57	2	59	59
Long-finned Pilot Whale	77	1	78	78
Atlantic White-sided Dolphin	4,09	18	427	427
Short-beaked Common Dolphin	5,431	141	5,572	5,572
Atlantic Spotted Dolphin	315	5	320	320

Species	Estimated Level B Takes - Lease Area	Estimated Level B Takes - ECR Area	Total Estimated Takes	Total Requested Takes
Harbor Porpoise	1,807	105	1,912	1,912
Common Bottlenose Dolphin Offshore Stock	1,212	104	1316	1316
Common Bottlenose Dolphin Northern Migratory Coastal Stock	0	115	115	115
Pinnipeds				
Gray Seal	1,764	191	1,955	1,955
Harbor Seal	1,764	191	1,955	1,955

Notes:
Take requests are all greater than average group size. See 0 for group size analysis.

Table 6-5 Total requested Marine Mammal Level B Harassment takes for HRG surveys in the Lease Area and ECR Area

Species	Abundance*	Total Requested Level B Takes - Lease and ECR Area	Percent of Abundance
Mysticetes			
North Atlantic Right Whale**	418†	24	5.74%
Humpback Whale	11,570‡	46	0.40%
Fin Whale	6,802¶	76	1.12%
Sei Whale	6,292¶	24	0.38%
Common Minke Whale	21,968¶	304	1.38%
Odontocetes			
Sperm Whale	11,185§	10	0.09%
Risso's Dolphin	35,493¶	59	0.17%
Long-finned Pilot Whale	39,215¶	78	0.20%
Atlantic White-sided Dolphin	93,233¶	427	0.46%
Short-beaked Common Dolphin	172,974¶	5,572	3.22%
Atlantic Spotted Dolphin	39,921†	320	0.80%
Harbor Porpoise	95,543¶	1,912	2.00%
Common Bottlenose Dolphin Offshore Stock	62,851¶	1,316	2.09%

Species	Abundance*	Total Requested Level B Takes - Lease and ECR Area	Percent of Abundance
Common Bottlenose Dolphin Northern Migratory Coastal Stock	6,639¶	115	1.73%
Pinnipeds			
Gray Seal	451,600‖	1,955	0.43%
Harbor Seal	91,336‖	1,955	2.14%

Notes:

Take requests are all greater than average group size. See Appendix C for group size analysis.

*The abundances in this column are the best available abundances of the total population size, inclusive of areas outside of the U.S. Exclusive Economic Zone. Letters specify the sources of the estimates.

**We have not changed the North Atlantic right whale abundance to the SAR abundance because the SAR abundance is not mathematically appropriate for comparison, but we understand that NMFS expects to use the SAR abundance of 368, which would result in a total of 6.79% of abundance estimated to be exposed.

† Maximum monthly abundance from the most recent model version from the Duke University Habitat-based Marine Mammal Density Models (Roberts et al. 2022)

‡ Estimate of the abundance of the West Indies breeding population that includes the Gulf of Maine feeding stock (Bettridge et al 2015; Stevick et al. 2003)

¶ NMFS Stock Assessment Reports (Hayes et al. 2022)

§ Abundance estimate for the North Atlantic based on 2001 surveys (Gunnlaugsson et al. 2009)

‖ Sum of abundance from the NMFS Stock Assessment Report (Hayes et al. 2022) which are abundances in U.S. waters, and estimates of abundance from the Atlantic coast in Canada (DFO 2019)

7 Anticipated Impact of the Activity

Federal Regulations establish the taking of small numbers of marine mammals may be allowed only if NMFS finds that the total taking will have a negligible impact on species or stock of marine mammal(s) (50 CFR § 216.102(a)). Negligible impact is defined as "an impact resulting from a specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stocks [of marine mammals] through effects on annual rates of recruitment or survival" per 50 CFR § 216.103 (CFR 2003).

Based on the best available science regarding the current status of marine mammal populations occurring in the area (including distribution, density, and population status), combined with the survey activities, a finding that these activities would only result in short-term and minimal effects and would therefore not affect the overall annual recruitment or survival of marine mammal species is supported.

Section 1 details the potential acoustic exposures from the activities that are within the non-injury behavioral effect zones (i.e., Level B harassment). The take estimate in Section 6 is conservative and does not incorporate the effects associated with mitigation and monitoring measures. Finally, the protective measures presented in Section 11 are designed to minimize and potentially avoid marine mammal exposures and interactions.

Marine mammals are mobile free-ranging animals and have the capacity to leave an area when noise-producing activities are initiated. Based on the conservative take estimates (Section 6), Project activities may disturb individual marine mammals. However, based on the factors listed above (type of activities, sound propagation, conservative approach to take estimates, and mitigation/protection measures), the activities are not expected to result in population-level effects that could be detrimental to the annual recruitment or survival of these species. Additionally, it is expected that animals will resume normal behavioral patterns after the cessation of activities or after the animals have left the area of ensonification.

Additionally, and for reference please see, Orsted (2020) Section 7. Overall, this section of Orsted (2020) describes minimal effects to habitat (see Section 9 below), and the temporary and localized nature of disturbance result in negligible effects, as defined in 50 CFR § 216.103 (CFR 2003), with no long-term or population level effects expected from behavioral reactions of marine mammals.

8 Anticipated Impacts on Subsistence Uses

There are no traditional subsistence hunting areas in the Survey Area; therefore, no impacts on the availability of species or stocks for subsistence use are anticipated.

9 Anticipated Impacts on Habitat

This section addresses the short- and long-term impacts of the proposed activity on marine mammals associated with the predicted loss or modification of habitat. This section also addresses the available methods and likelihood of restoration of modified or lost habitat. The anticipated impacts to marine mammal habitats are described below and discussed in further detail in Section 10. The proposed survey is expected to occur over a one-year period with an estimated 41 weeks of survey in the Lease Area (with multiple vessels) and estimated one month of survey in the ECR Area.

9.1 Short-Term Impact

Short-term impacts have been identified as potential impacts to marine mammal habitat. Increased ambient sound levels from vessels and equipment might have localized and transient effects during the actual activities and would only temporarily affect potential marine mammal prey availability.

9.2 Long-Term Impact

The minimal acoustic disturbance and the short duration of the activities are not expected to generate any long-term impact associated with habitat loss or modification. Habitat restoration is therefore not discussed any further.

10 Anticipated Effects of Habitat Impacts on Marine Mammals

This section addresses the short- and long-term impacts of the proposed activity on marine mammals resulting from the predicted loss or modification of habitat described in Section 9.

10.1 Short-Term Impact

Marine mammals rely extensively on sound to communicate, navigate, and forage. Their acoustic habitat is therefore important to consider when looking at the impact of anthropogenic activities. Changes in their acoustic habitat could determine access to resources. In that sense, a sound source could represent a temporary habitat loss as the anthropogenic source could occupy the frequency range generally utilized by marine mammals (Rice et al, 2014) for echolocation and communication. Assessing how the HRG sources overlap with these frequencies is important to assess the potential temporary habitat loss associated with acoustic sources. Therefore, the frequency content, source levels, and sound propagation profile of the proposed activities will determine the extent of the acoustic habitat loss and will be species or hearing-group dependent. Generally, because of the short durations of the activities, marine mammals might experience a short-term loss of acoustic habitat during HRG surveys if they are within the area of ensonification (within 141 m of a sparker for the proposed HRG survey equipment), but the extent and duration of this loss is not expected to represent a significant or long-term loss of habitat.

Marine mammals' prey might also be impacted by the HRG sound sources operating at frequencies below 180 kHz and thus indirectly affect prey availability to marine mammals. A small decline in catch rates following seismic activities was reported for several fish species (Whitlock and Schluter, 2009; Engas et al. 1996). Fish distribution has been reported to return to baseline levels rapidly following the exposure to seismic activities, indicating that the acoustic habitat is only temporarily modified (Hassel et al, 2004). Given the low levels of sound energy generated by HRG sources compared to seismic surveys in these studies, no short-term impacts to prey distribution are anticipated.

In summary, marine mammals might experience temporary loss of acoustic habitat within a small area in close vicinity to the HRG survey equipment, but this is not expected to represent a substantive loss of habitat. Similarly, the impact of the activities on the prey fields are anticipated to be temporary and unlikely to generate any substantive impacts on marine mammals.

10.2 Long-Term Impact

No long-term impacts to marine mammals associated with potential loss or modification of habitat is expected as the proposed activities are short in duration and likely to cause minimal disturbance.

11 Mitigation Measures to Protect Marine Mammals and their Habitat

Community Offshore Wind is proposing a comprehensive set of mitigation measures during its HRG surveys to minimize impacts to marine mammal species. These mitigation measures will provide protection to marine mammals by minimizing exposure to sound during surveys and by reducing the likelihood of vessel strikes to marine mammals. Community Offshore Wind will operate under the requirements of NMFS while conducting its survey; however, Community Offshore Wind provides proposed mitigation and monitoring measures below for NMFS' consideration in developing its measures. Community Offshore Wind proposes to operate its offshore survey equipment 24-hours, during nighttime and low-visibility, and provides measures below that allow for implementation of mitigation during these times in compliance with MMPA and the ESA LOC associated with BOEM's Environmental Assessment for authorizing site characterization surveys under Outer Continental Shelf Lands Act (OCSLA). Community Offshore Wind will also prepare an alternative monitoring plan (AMP) as required by BOEM for purposes of OCSLA and ESA compliance.

ESA requirements determined under the LOC noted above are included in proposed mitigation, monitoring, and reporting measures and described specifically below**Error! Reference source not found.**. Table 11-1 summarizes proposed clearance and shutdown zones, and vessel strike avoidance distances, and is based on NMFS' proposed mitigation measures for the draft IHA for Bluepoint Wind HRG surveys in the New York Bight[1],

Table 11-1 Distances for Clearance and Shutdown Zones and Vessel Strike Avoidance.

<table>
<tr><th>Species</th><th>ESA-listed?</th><th colspan="2">Clearance Zone</th><th>Vessel Strike Avoidance</th><th colspan="2">Shutdown Zone</th></tr>
<tr><td></td><td></td><td>Distance (m)</td><td>Duration (minutes)</td><td>Distance (m)</td><td>Distance (m)</td><td>Duration (minutes)</td></tr>
<tr><td>North Atlantic Right Whale</td><td rowspan="4">Yes</td><td rowspan="4">500</td><td rowspan="6">30</td><td rowspan="4">500</td><td>500</td><td rowspan="6">30</td></tr>
<tr><td>Fin Whale</td><td rowspan="3">100</td></tr>
<tr><td>Sei whale</td></tr>
<tr><td>Sperm Whale</td></tr>
<tr><td>Humpback Whale</td><td rowspan="4">No</td><td rowspan="4">100</td><td rowspan="2">100</td><td rowspan="4">100</td></tr>
<tr><td>Minke Whale</td></tr>
<tr><td>Long-finned Pilot Whale</td><td rowspan="2">15</td><td rowspan="2">50 (as feasible)</td><td rowspan="2">15</td></tr>
<tr><td>Risso's Dolphin</td></tr>
</table>

[1] Accessed at https://www.fisheries.noaa.gov/s3/2023-01/BluepointWind_2023IHA_Proposed_OPR1.pdf.pdf on January 25, 2023.

Harbor Porpoise						
Gray Seal		Not required			Not required	
Harbor Seal						
Atlantic White-sided Dolphin						
Atlantic Spotted Dolphin						
Common Bottlenose Dolphin						
Common Dolphin						

Notes:

Measures are the same as those in the Bluepoint Wind draft IHA published by NMFS January 13, 2023 (88 FR 2325).

Periods of 15 min (rather than 30 min) before ramp-up after last observation of Risso's dolphins or pilot whales in clearance and shutdown zones is supported by the following:

- Sound sources are not sufficiently loud to injure animals – the Level A zone is 0 m for mid-frequency cetaceans and seals.
- The vessel is moving. Traveling at 3.8 kts (7 km/hour), the vessel will be >1.75 km away from the location of observed animals in 15 minutes – very far from the 100 m clearance and exclusion zones and the potential Level B harassment zones.
- The maximum Level B harassment radius is 157.7 m, so the vessel reaches the end of the zone where harassment is most likely to occur within 1.4 minutes and moves beyond the 100 m clearance and shutdown zones in less than 1 minute. As described for clearance, delays due to shutdown can result in the vessel spending more time on the water to re-run trackline areas that are missed, increasing vessel collision risks, potential impacts to ESA-listed species, and human safety risks – shutdown should reduce impacts but when applied to species and at distances for which there is little impact, it can increase potential to harass or incur collision with species with more sensitivity through prolonging surveys.

11.1 Mitigation Measures

11.1.1 General

a. Community Offshore Wind will employ independent, qualified, NMFS-approved Protected Species Observers (PSOs; as described in Section 13.1) to conduct visual monitoring during the use of the proposed sparker systems. When the impulsive sparker system (**Error! Reference source not found.**Table 1-1) is operating on a 24-hour HRG survey, a minimum of one (1) PSO will be on duty during daylight hours and two (2) PSOs will be on duty during nighttime hours. During night and low-visibility, night-vision and thermal equipment will be used by PSOs to observe animals. ESA-listed species sightings will be communicated between vessels on the survey via radio or from PSOs reporting software where feasible and will not prevent the PSOs from conducting their responsibilities.

b. Visual monitoring will begin no less than 30 minutes prior to initiation of the sparker system and will continue until 30 minutes after use of these acoustic sources ceases.

c. Operational Shutdown Zones – PSOs will establish and monitor marine mammal Shutdown Zones. Distances to Shutdown Zones will be from the acoustic sources, not the distance from the vessel. Shutdown Zones will be as follows:

   i. 500 m Shutdown Zone for North Atlantic right whales for use of the sparker system; and

   ii. 100 m Shutdown Zone for all other marine mammals for use of the sparker system except for as noted in g(vii) below.

d. Harassment Zones – PSOs will establish and monitor Level B harassment zones specific to the sparker system during the survey. Harassment Zones will be as follows:

   i. 141 m Harassment Zone for all marine mammals during survey operations employing one sparker system as the predominant acoustic source.

   ii. 157.7 m Harassment Zone for all marine mammals during survey operations employing a three sparker array using the Dura-Spark equipment.

   iii. 156.5 m Harassment Zone for all marine mammals during survey operations employing a three sparker array using the Geo-Source (400 tips) equipment.

e. Pre-start clearance observation – PSOs will conduct 30 minutes of pre-start clearance observation prior to initiation of survey operations (except as described in g(ix) below). If a marine mammal is observed entering or within the pre-start clearance zones (described below) during the pre-start clearance period, the sparker system will not be initiated until the marine mammal(s) is confirmed by visual observation to have exited the relevant zone, or, until an additional time period has elapsed with no further sighting of the animal (15 minutes for odontocetes [except sperm whales] and 30 minutes for sperm whales and baleen whales). The pre-start clearance requirement does not include small delphinids (genera *Stenella*, *Lagenorhynchus*, *Delphinus*, or *Tursiops*) or seals. HRG surveys using the sparker system will not be initiated if:

   i. A North Atlantic right whale or other ESA-listed whale is observed within a 500 m radius of the sparker system during the pre-start clearance period;

   ii. Any other ESA-listed marine mammals are observed within a 100 m radius of the sparker system during the pre-start clearance period; or

   iii. Any non-ESA-listed marine mammals, except small delphinids or seals, are observed within a 100 m radius of the sparker system during the pre-start clearance period.

f. Ramp-up – when technically feasible the sparker system will be ramped up at the start or restart of survey activities. Ramp-up will begin with the power of the smallest acoustic source at its lowest practical power output. When technically feasible the power will then be gradually turned up and other acoustic sources added in a way that the source level would increase gradually.

   i. Ramp-up activities will be delayed if a marine mammal(s) enters its respective shutdown zone. Ramp-up will continue if the animal has been observed exiting its respective shutdown zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for odontocetes, except sperm whales, and 30 minutes for sperm whales and baleen whales).

g. Shutdown requirements:

   i. If a marine mammal is observed within or entering the relevant Shutdown Zones as described under (c) while the sparker system is operational, the sparker system will be immediately shut down (except as described in (g)(vii)).

   ii. Any PSO on duty will have the authority to call for shutdown of acoustic sources. When there is certainty regarding the need for mitigation action based on visual detection, the relevant PSO(s) will call for such action immediately.

iii. When a shutdown is called for by a PSO, the shutdown will occur, and any dispute resolved only following shutdown.

iv. The vessel operator will establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the sparker system to ensure that shutdown commands are conveyed swiftly, while allowing PSOs to maintain watch.

v. Upon implementation of a shutdown, survey equipment may be reactivated when all marine mammals that triggered the shutdown have been confirmed by visual observation to have exited the relevant Shutdown Zone or an additional time period has elapsed with no further sighting of the animal that triggered the shutdown (15 minutes for odontocetes except sperm whales and 30 minutes for sperm whales and baleen whales).

vi. If the sparker system is shut down for less than 30 minutes for reasons other than marine mammal mitigation (e.g., due to mechanical or electronic failure) this acoustic equipment may be re-activated as soon as is practicable at full operational level if PSOs have maintained constant visual observation during the shutdown and no visual detections of marine mammals occurred within the applicable Shutdown Zone during that time. For a shutdown of 30 minutes or longer, or if visual observation was not continued diligently during the pause, pre-start clearance observation will be undertaken as described in (e).

vii. If delphinids from the genera *Delphinus*, *Lagenorhynchus*, *Stenella* (*frontalis* only), or *Tursiops* or seals (Table 3-1) are visually detected, shutdown will not be implemented. If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera or is a seal for which shutdown is waived), PSOs will use best professional judgment in making the decision to call for a shutdown.

viii. Shutdown of acoustic sources will occur upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met, entering or within the Level B harassment zone.

ix. Shutdown, pre-start clearance, and ramp-up procedures will not be implemented during HRG survey operations using only non-impulsive sources.

h. Vessel Strike Avoidance – Vessel operators and crews will maintain a vigilant watch for all marine mammals and slow down, stop the vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any marine mammals. Survey vessel crew members responsible for navigation duties will receive site-specific training on marine mammal sightings/reporting and vessel strike avoidance measures. Vessel strike avoidance measures will include the following, except under circumstances when compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of the restriction, cannot comply:

i. A visual observer aboard the vessel will monitor a vessel strike avoidance zone based on the appropriate separation distance around the vessel (distances stated below).

ii. Visual observers monitoring the vessel strike avoidance zone may be third-party observers (i.e., PSOs) or crew members. Crew members responsible for these duties will be provided sufficient training to 1) distinguish protected species from other phenomena and 2) broadly identify a marine mammal as a right whale, other whale (defined in this context as sperm whales or baleen whales other than right whales), or other marine mammal.

iii. All survey vessels, regardless of size, will observe a 10 kt speed restriction in specific areas designated by NMFS for the protection of North Atlantic right whales from vessel strikes including seasonal management areas (SMAs) and dynamic management areas (DMAs) when in effect.

iv. All vessels greater than or equal to 19.8 m in overall length operating from November 1 through April 30 will operate at speeds of 10 kts or less while transiting to and from Survey Area.

v. All vessels will reduce their speed to 10 kts or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near a vessel.

vi. All vessels will maintain a minimum separation distance of 500 m from right whales. If a whale is observed but cannot be confirmed as a species other than a right whale, the vessel operator will assume that it is a right whale and take appropriate action.

vii. All vessels will maintain a minimum separation distance of 100 m from sperm whales and all other baleen whales (except right whales, as specified in item vi).

viii. All vessels will, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other marine mammals, with an understanding that at times this may not be possible (e.g., for animals that approach the vessel).

ix. When marine mammals are sighted while a vessel is underway, the vessel will take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If marine mammals are sighted within the relevant separation distance, the vessel will reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This will not apply to any vessel towing gear or any vessel that is navigationally constrained.

x. These measures do not apply in any case where compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of the restriction, cannot comply.

11.1.2 Endangered Species Act Specific Measures

NMFS provides Appendix B to its LOC that outlines the PDCs and BMPs for site characterization and site assessment activities to support offshore wind projects. Community Offshore Wind proposes to be compliant with applicable measures provided by NMFS to BOEM in the LOC and any adjustments approved by NMFS and will therefore implement the measures applicable to the surveys, as described below.

Some measures described in the LOC are not applicable to the surveys and this IHA request. These measures include:

- Measures that do not pertain at all to marine mammals, including sea turtle, coral, and fish mitigation;
- Measures associated with autonomous surface vessel (none of these vessels have been proposed for use);
- Measures for Cape Cod or the right whale calving critical habitat (these are outside the proposed Survey Area);
- Marine debris measures are not described; and
- Measures for mooring systems and buoys (no mooring systems or buoys are proposed).

All lease stipulations and LOC requirements as required at the time of survey, except as noted above, will be implemented regardless of whether they are explicitly listed in this application.

A. Avoid Live Bottom Features

All vessel anchoring and any seafloor-sampling activities (i.e., drilling or boring for geotechnical surveys) will avoid seafloor areas with consolidated seabed features (pavement, scarp walls, and deep/cold-water coral reefs and shallow/mesophotic reefs as defined in the Coastal and Marine Ecological Classification Standard Geologic Substrate Classifications). All sensitive live bottom habitats (eelgrass, cold-water corals, etc.) will be avoided as practicable. All vessels in coastal waters will operate in a manner to minimize propeller wash and

seafloor disturbance and transiting vessels will follow deep-water routes (e.g., marked channels), as practicable, to reduce disturbance to sturgeon and sawfish habitat.

B. Minimize Interactions with Listed Species during Geophysical Survey Operations

For all vessels operating survey equipment that emits sound at frequency ranges <180 kHz (within the functional hearing range of marine mammals), the following measures will be implemented: The Clearance Zone is defined as the area around the sound source that needs to be visually cleared of listed species for 30 minutes before the sound source is turned on. The Clearance Zone is equivalent to a minimum visibility zone for survey operations to begin. The Shutdown Zone is defined as the area around the sound source that must be monitored for possible shutdown upon detection of listed species within or entering that zone. For both the Clearance and Shutdown Zones, these are minimum visibility distances and for situational awareness PSOs will observe beyond this area when possible.

a. For situational awareness a Clearance Zone extending at least 500 m (in all directions) will be established around all vessels operating sources <180 kHz.
    i. The Clearance Zone will be monitored by approved third-party PSOs at all times required and any observed listed species will be recorded.
b. To minimize exposure to sound that could be disturbing, Shutdown Zone(s) (500 m for North Atlantic right whales and 100 m for other ESA-listed whales visible at the surface) will be established around the sources operating at <180 kHz being towed from the vessel.
    i. The Shutdown Zone(s) will be monitored by third-party PSOs at all times required when noise-producing equipment (<180 kHz) is being operated and all observed listed species will be recorded.
    ii. If an ESA-listed species is detected within or entering its respective Shutdown Zone, any noise-producing equipment operating below 180 kHz will be shut off until the minimum separation distance from the source is re-established (500 m for North Atlantic right whales and 100 m for other ESA-listed marine mammals) and the measures in ‘e’ are carried out.
    iii. A PSO will notify the survey crew that a shutdown of all active sparker acoustic sources below 180 kHz is immediately required. The vessel operator and crew will comply immediately with any call for a shutdown by the PSO. Any disagreement or discussion will occur only after shutdown.
    iv. If the Shutdown Zone(s) cannot be adequately monitored for ESA-listed species presence (i.e., a PSO determines conditions, including at night or other low-visibility conditions, are such that listed species cannot be reliably sighted within the Shutdown Zone[s]), no equipment operating at <180 kHz will be deployed until such time that the Shutdown Zone(s) can be reliably monitored.
c. Before any noise-producing survey equipment (operating at <180 kHz) is deployed, the Clearance Zone (500 m for all listed species) will be monitored for 30 minutes of pre-clearance observation.
    i. If any ESA-listed species is observed within the Clearance Zone during the 30-minute pre-clearance period, the 30-minute clock will be paused. If the PSO confirms the animal has exited the zone and is headed away from the survey vessel, the 30-minute clock that was paused will resume. The pre-clearance clock will reset to 30 minutes if the animal dives or visual contact is otherwise lost.
d. When technically feasible, a “ramp up” of the electromechanical survey equipment will occur at the start or re-start of geophysical survey activities. A ramp up will begin with the power of the smallest acoustic equipment for the geophysical survey at its lowest power output. When technically feasible the power will then be gradually turned up and other acoustic sources added in a way such that the source level would increase gradually.

e. Following a shutdown for any reason, ramp up of the equipment will begin immediately only if: (a) the shutdown is less than 30 minutes, (b) visual monitoring of the Shutdown Zone(s) continued throughout the shutdown, (c) the animal(s) causing the shutdown was visually followed and confirmed by PSOs to be outside of the Shutdown Zone(s) (500 m for North Atlantic right whales and 100 m for other ESA-listed marine mammals) and heading away from the vessel, and (d) the Shutdown Zone(s) remains clear of all listed species. If all (a, b, c, and d) the conditions are not met, the Clearance Zone (500 m for all listed species) will be monitored for 30 minutes of pre-clearance observation before noise-producing equipment will be turned back on.

f. In order for geophysical surveys to be conducted at night or during low-visibility conditions, PSOs will need to be able to effectively monitor the Clearance and Shutdown Zone(s). No survey may occur if the Clearance and Shutdown Zone(s) cannot be reliably monitored for the presence of ESA-listed species to ensure avoidance of injury to those species.

   i. An AMP will be submitted to BOEM detailing the monitoring methodology that will be used during nighttime and low-visibility conditions and an explanation of how it will be effective at ensuring that the Shutdown Zone(s) can be maintained during nighttime and low-visibility survey operations. The plan will be submitted to BOEM at least 60 days before survey operations are set to begin.

   ii. Two PSOs will be on watch during nighttime hours.

   iii. The AMP will include technologies that have the technical feasibility to detect ESA-listed whales out to 500 m (and sea turtles to 100 m).

   iv. PSOs will be trained and experienced with the proposed alternative monitoring technology.

   v. The AMP will describe how calibration will be performed, for example, by including observations of known objects at set distances and under various lighting conditions. This calibration will be performed during mobilization and periodically throughout the survey operation.

   vi. PSOs will make night-time observations from the most effective location on the deck of the vessel that is not impacted by direct lighting with no visual barriers, due to the potential for the reflectivity from bridge windows or other structures to interfere with the use of the night vision optics.

g. At times when multiple survey vessels are operating within a lease area, adjacent lease areas, or exploratory cable routes, a minimum separation distance (to be determined on a survey specific basis, dependent on equipment being used) must be maintained between survey vessels to ensure that sound sources do not overlap.

h. Any visual observations of listed species by crew or Project personnel will be communicated to PSOs on-duty.

   i. During good conditions (e.g., daylight hours; Beaufort scale 3 or less) when survey equipment is not operating, to the maximum extent practicable, PSOs will conduct observations for protected species for comparison of sighting rates and behavior with and without use of active geophysical survey equipment. Any observed listed species will be recorded regardless of any mitigation actions required.

C. Minimize Vessel Interactions with Listed Species

All vessels associated with survey activities (transiting [i.e., travelling between a port and the survey site] or actively surveying) will comply with the vessel strike avoidance measures specified below. The only exception will be when the safety of the vessel or crew necessitates deviation from these requirements. If any such incidents occur, they will be reported as outlined in Section 13.1.2. The Vessel Strike Avoidance Zone is defined as 500 m or greater from any sighted ESA-listed species or other unidentified large marine mammal.

a. Vessel captain and crew will maintain a vigilant watch for all protected species and slow down, stop the vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any listed species. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures will be exercised.

b. Anytime a survey vessel is underway (transiting or surveying), the vessel will maintain a 500 m minimum separation distance and a PSO will monitor a Vessel Strike Avoidance Zone (500 m or greater from any sighted ESA-listed species or other unidentified large marine mammal visible at the surface) to ensure detection of that animal in time to take necessary measures to avoid striking the animal.

    i. Survey plans will include identification of vessel strike avoidance measures, including procedures for equipment shut down and retrieval, communication between PSOs/crew lookouts, equipment operators, and the captain, and other measures necessary to avoid vessel strike while maintaining vessel and crew safety. If any circumstances are anticipated that may preclude the implementation of this PDC, they must be clearly identified in the survey plan and alternative procedures outlined in the plan to ensure minimum distances are maintained and vessel strikes can be avoided.

    ii. All vessel crew members will be briefed in the identification of protected species that may occur in the Survey Area and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all Project vessels for identification of listed species. The expectation and process for reporting of protected species sighted during surveys must be clearly communicated and posted in highly visible locations aboard all Project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so.

    iii. The Vessel Strike Avoidance Zone(s) are a minimum and will be maintained around all surface vessels at all times.

    iv. If a large whale is identified within 500 m of the forward path of any vessel, the vessel operator must steer a course away from the whale at 10 kts (18.5 km/hour) or less until the 500 m minimum separation distance has been established. Vessels may also shift to idle if feasible.

    v. If a large whale is sighted within 200 m of the forward path of a vessel, the vessel operator will reduce speed and shift the engine to neutral. Engines will not be engaged until the whale has moved outside of the vessel's path and beyond 500 m. If stationary, the vessel will not engage engines until the large whale has moved beyond 500 m.

c. To monitor the Vessel Strike Avoidance Zone, a PSO (or crew lookout if PSOs are not required) will be posted during all times a vessel is underway (transiting or surveying) to monitor for listed species within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard).

    i. Visual observers monitoring the vessel strike avoidance zone can be either PSOs or crew members (if PSOs are not required). If the trained lookout is a vessel crew member, this will be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts will receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. All observations will be recorded per reporting requirements.

    ii. Regardless of monitoring duties, all crew members responsible for navigation duties will receive site-specific training on ESA-listed species sighting/reporting and vessel strike avoidance measures.

d. Vessel operators will reduce vessel speed to 10 kts (18.5 miles per hour) or less while operating in any Seasonal Management Area (SMA) and Dynamic Management Area (DMA) and Slow Zones. The only exception to this requirement is for vessels operating in areas within a DMA or Slow Zone where it is

not reasonable to expect the presence of North Atlantic right whales (e.g., Long Island Sound, shallow harbors).

e. Vessels underway will not divert their course to approach any listed species.

f. All vessel operators will check for information regarding mandatory or voluntary ship strike avoidance (SMAs, DMAs, Slow Zones) and daily information regarding North Atlantic right whale sighting locations. These media may include but are not limited to: National Oceanic and Atmospheric Administration (NOAA) weather radio, U.S. Coast Guard NAVTEX and channel 16 broadcasts, Notices to Mariners, the Whale Alert app, or WhaleMap website.

   i. North Atlantic right whale Sighting Advisory System info will be accessed at: https://apps-nefsc.fisheries.noaa.gov/psb/surveys/MapperiframeWithText.html

   ii. Information about active SMAs, DMAs, and Slow Zones will be accessed at: https://www.fisheries.noaa.gov/national/endangered-species- conservation/reducing-vessel-strikes-north-atlantic-right-whales

12 Mitigation Measures to Protect Subsistence

Potential impacts to species or stocks of marine mammals will be limited to individuals of marine mammal species located in the northeast region of the U.S. and will not affect Arctic marine mammals. Given that the Survey Area is not located in Arctic waters, the activities associated with site characterization surveys will not have an adverse effect on the availability of marine mammals for subsistence uses allowable under the MMPA.

13 Monitoring and Reporting

13.1 Monitoring

13.1.1 General

Community Offshore Wind will conduct marine mammal visual monitoring during HRG survey activity using the sparker system. Monitoring will be conducted in accordance with the following:

1. Visual monitoring will be performed by qualified, NMFS-approved PSOs during operation of HRG survey equipment operating below 180 kHz (sparker systems). PSO resumes will be provided to NMFS for review and approval prior to the start of survey activities.
2. In order to be considered qualified, PSOs will have successfully completed an acceptable PSO training course and/or have demonstrated experience in the role of independent PSO during an HRG survey. In the event it is relevant, on a case-by-case basis, non-independent observers may be proposed to NMFS for limited, specific duties in support of approved, independent PSOs on smaller vessels with limited crew capacity operating in nearshore waters.
3. PSOs will be employed by a third-party observer provider when required and will not have tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements (including brief alerts regarding maritime hazards). At least one PSO aboard the vessel with acoustic sources will have a minimum of 90 days at-sea experience working as a PSO during a geophysical survey, with no more than 18 months elapsed since the conclusion of the at-sea experience. This lead PSO will coordinate duty schedules and roles for the PSO team and serve as primary point of contact for the vessel operator (note that the responsibility of coordinating duty schedules and roles may instead be assigned to a shore-based, third-party monitoring coordinator). To the maximum extent practicable, the lead PSO will devise the duty schedule such that experienced PSOs are on duty with those PSOs with appropriate training but who have not yet gained relevant experience.
4. PSOs will coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts.
5. PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least two hours between watches and may conduct a maximum of 12 hours of observation per 24-hour period.
6. PSOs will be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or Shutdown Zones. Reticulated binoculars will be available to PSOs for use as appropriate based on conditions and visibility to support the sighting and monitoring of marine species.
7. Position data will be recorded using hand-held or vessel global positioning system (GPS) units for each sighting.
    a. PSOs will consult NMFS North Atlantic right whale reporting system and Whale Alert, as able, for the presence of right whales throughout survey operations, and for the establishment of any DMAs. If NMFS should establish a DMA in the Lease Areas during the survey, the vessels will abide by speed restrictions in the DMA.
    b. Visual PSOs will conduct observations in the following circumstances (in addition to those described in Section 11 Mitigation Measures, 11.1.1 General, Sub-section (b):

i. During good conditions (e.g., daylight hours; Beaufort sea state 3 or less) and no acoustic source is operating, for comparison of sighting rates and behavior with and without use of the specified acoustic sources and between acquisition periods (to the maximum extent practicable)

c. Night-vision equipment (i.e., night-vision goggles with thermal clip-ons and infrared/thermal imaging technology) will be available for use during nighttime monitoring.

d. Any observations of marine mammals by crew members aboard any vessel associated with the survey will be relayed to the PSO team.

e. In cases when pre-start clearance has begun in conditions with good visibility, including via the use of night-vision equipment, and the lead PSO has determined that the pre-start clearance zones (as described in Section 11 Mitigation Measures, 11.1.1 General, Sub-section (e)) are clear of relevant marine mammals, survey operations may commence (i.e., no delay will be implemented) despite brief periods of inclement weather and/or loss of daylight. In cases where Shutdown Zones (as described in Section 11 Mitigation Measures, 11.1.1 General, Sub-section (c)) become obscured for brief periods due to inclement weather, survey operations may continue (i.e., no shutdown will be implemented).

f. Data on all PSO observations will be recorded based on standard PSO collection requirements. PSOs will use standardized data forms, whether hard copy or electronic. The following information will be reported:

i. PSO names and affiliations

ii. Dates of departures and returns to port with port name

iii. Dates and times (Greenwich Mean Time) of survey effort and times corresponding with PSO effort

iv. Vessel location (latitude/longitude) when survey effort begins and ends; vessel location at beginning and end of visual PSO duty shifts

v. Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any line change

vi. Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including wind speed and direction, Beaufort sea state, Beaufort wind force, swell height, weather conditions, cloud cover, sun glare, and overall visibility to the horizon

vii. Factors that may be contributing to impaired observations during each PSO shift change or as needed as environmental conditions change (e.g., vessel traffic, equipment malfunctions)

viii. Survey activity information, such as type of survey equipment in operation, acoustic source power output while in operation, and any other notes of significance (i.e., pre-start clearance survey, ramp-up, shutdown, end of operations, etc.)

ix. If a marine mammal is sighted, the following information should be recorded:

A. Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform)

B. PSO who sighted the animal

C. Time of sighting

D. Vessel location at time of sighting

E. Water depth

F. Direction of vessel's travel (compass direction)

G. Direction of animal's travel relative to the vessel

H. Pace of the animal

I. Estimated distance to the animal and its heading relative to vessel

J. Identification of the animal (e.g., genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix of species

K. Estimated number of animals (high/low/best)

L. Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.)

M. Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics)

N. Detailed behavior observations (e.g., number of blows, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior)

O. Animal's closest point of approach and/or closest distance from the center point of the acoustic source

P. Description of any actions implemented in response to the sighting (e.g., delays, shutdown, ramp-up, speed or course alteration, etc.)

13.1.2 Endangered Species Act Specific Monitoring

Community Offshore Wind proposes to be compliant with applicable measures provided by NMFS to BOEM in the LOC from Jennifer Anderson, Assistant Regional Administrator for Protected Resources at NMFS to James Bennett, Program manager at the BOEM Office of Renewable Energy Programs dated June 29, 2021 and revised in September 2021. Below Community Offshore Wind clearly states the monitoring that will be implemented to achieve full compliance with the applicable measures, as determined by NMFS. NMFS provides Appendix B to its LOC that outlines the PDCs and BMPs for threatened and endangered species for site characterization and site assessment activities to support offshore wind projects. There may be some redundancy with monitoring described above, but to be clear that the surveys will be in compliance with the LOC that redundancy is maintained in the measures below.

Qualified third-party PSOs to observe Clearance and Shutdown Zones as required will be used as outlined in the conditions above and below.

1. All PSOs will have completed an approved PSO training program and must receive NMFS approval to act as a PSO for geophysical surveys. Documentation of NMFS approval for geophysical survey activities in the Atlantic and copies of the most recent training certificates of individual PSO's successful completion of a commercial PSO training course with an overall examination score of 80% or greater will be provided upon request. Instructions and application requirements to become a NMFS-approved PSO can be found at: www.fisheries.noaa.gov/national/endangered-species-conservation/protected-species-observers.
2. In situations in which third-party party PSOs are not required, crew members serving as lookouts will receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements.
3. PSOs deployed for geophysical survey activities will be employed by a third-party observer provider when required. While the vessel is underway, they will have no other tasks than to conduct observational effort, record data, and communicate with and instruct relevant vessel crew to the presence of listed species and associated mitigation requirements. PSOs on duty will be clearly listed on daily data logs for each shift.
    a. Non-third-party observers may be approved by NMFS on a case-by-case basis for limited, specific duties in support of approved, third-party PSOs.

4. A minimum of one PSO (assuming condition 5 below is met) must be on duty observing for listed species at all times that noise-producing equipment <180 kHz is operating, or the survey vessel is actively transiting during daylight hours (i.e., from 30 minutes prior to sunrise and through 30 minutes following sunset). Two PSOs will be on duty during nighttime operations. A PSO schedule showing that the number of PSOs used is sufficient to effectively monitor the affected area for the Project (e.g., surveys) and record the required data will be included. PSOs will not be on watch for more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch. PSOs must not be on active duty observing for more than 12 hours in any 24-hour period.
5. Visual monitoring must occur from the most appropriate vantage point on the associated operational platform that allows for 360-degree visual coverage around the vessel. If 360-degree visual coverage is not possible from a single vantage point, multiple PSOs will be on watch to ensure such coverage.
6. Suitable equipment will be available to each PSO to adequately observe the full extent of the Clearance and Shutdown Zones during all vessel operations and meet all reporting requirements.
    a. Visual observations will be conducted using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.
    b. Rangefinders (at least one per PSO, plus backups) or reticle binoculars (e.g., 7 x 50) of appropriate quality (at least one per PSO, plus backups) to estimate distances to listed species located in proximity to the vessel and Clearance and Shutdown Zone(s).
    c. Digital full frame cameras with a telephoto lens that is at least 300 mm or equivalent; the camera or lens will also have an image stabilization system. Used to record sightings and verify species identification whenever possible.
    d. A laptop or tablet to collect and record data electronically.
    e. Global Positioning Units (GPS) if data collection/reporting software does not have built-in positioning functionality.
    f. PSO data must be collected in accordance with standard data reporting, software tools, and electronic data submission standards approved by BOEM and NMFS for the particular activity.
    g. Any other tools deemed necessary to adequately perform PSO tasks.

13.2 Reporting

13.2.1 General

1. A final technical monitoring report will be provided to NMFS within 90 days after completion of survey activities or expiration of the IHA, whichever comes sooner. The report will fully document the methods and monitoring protocols, summarize the data recorded during monitoring, describe, assess, and compare the effectiveness of monitoring and mitigation measures. Any recommendations made by NMFS will be addressed in the final report prior to acceptance by NMFS. PSO datasheets or raw sightings data will also be provided with the draft and final monitoring report.
2. Reporting sightings of North Atlantic right whales:
    a. If a North Atlantic right whale is observed at any time by PSOs or personnel on any Project vessels, during surveys or during vessel transit, the PSO will immediately report sighting information to the NMFS North Atlantic Right Whale Sighting Advisory System: (866) 755-6622. North Atlantic right whale sightings in any location will also be reported to the U.S. Coast Guard via channel 16.
3. Reporting injured or dead marine mammals:

a. In the event that personnel involved in the survey activities covered by the authorization discover an injured or dead marine mammal, Community Offshore Wind will report to the NMFS New England/Mid-Atlantic Regional Stranding Coordinator by phone (866-755-6622) or by email (nmfs.gar.stranding@noaa.gov and PR.ITP.MonitoringReports@noaa.gov) as soon as feasible. The report will include the following information:
    i. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable)
    ii. Species identification (if known) or description of the animal(s) involved
    iii. Condition of the animal(s) (including carcass condition if the animal is dead)
    iv. Observed behaviors of the animal(s), if alive
    v. If available, photographs or video footage of the animal(s)
    vi. General circumstances under which the animal was discovered
b. In the event of a vessel strike of a marine mammal by any vessel involved in the activities covered by the authorization, Community Offshore Wind will report the incident to the NMFS New England/Mid-Atlantic Regional Stranding Coordinator (866-755-6622) and NMFS Office of Protected Resources (nmfs.gar.stranding@noaa.gov and PR.ITP.MonitoringReports@noaa.gov) as soon as feasible. The report will include the following information:
    i. Time, date, and location (latitude/longitude) of the incident
    ii. Species identification (if known) or description of the animal(s) involved
    iii. Vessel's speed during and leading up to the incident
    iv. Vessel's course/heading and what operations were being conducted (if applicable)
    v. Status of all sound sources in use
    vi. Description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike
    vii. Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, visibility) immediately preceding the strike
    viii. Estimated size and length of animal that was struck
    ix. Description of the behavior of the marine mammal immediately preceding and following the strike
    x. If available, description of the presence and behavior of any other marine mammals immediately preceding the strike
    xi. Estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared)
    xii. To the extent practicable, photographs or video footage of the animal(s)

13.2.2 Endangered Species Act Specific Reporting

Community Offshore Wind proposes to be compliant with applicable measures provided by NMFS to BOEM in the LOC from Jennifer Anderson, Assistant Regional Administrator for Protected Resources at NMFS to James Bennett, Program manager at the BOEM Office of Renewable Energy Programs dated June 29, 2021. Below Community Offshore Wind clearly states the reporting that will be implemented to achieve full compliance with the reasonable and prudent measures, as determined by NMFS. NMFS provides Appendix B to its LOC that outlines the PDCs and BMPs for threatened and endangered species for site characterization and site assessment activities to support offshore wind projects. There may be some redundancy with reporting measures described

above, but to be clear that Community Offshore Wind will be in compliance with the LOC that redundancy is maintained in the measures below.

1. Data from all PSO observations will be recorded based on standard PSO collection and reporting requirements. PSOs must use standardized electronic data forms to record data. The following information will be reported electronically in a format approved by BOEM and NMFS:
    a. Visual Effort:
        i. Vessel name
        ii. Dates of departures and returns to port with port name
        iii. Lease number
        iv. PSO names and affiliations
        v. PSO ID (if applicable)
        vi. PSO location on vessel
        vii. Height of observation deck above water surface (in meters)
        viii. Visual monitoring equipment used
        ix. Dates and times (Greenwich Mean Time) of survey on/off effort and times corresponding with PSO on/off effort
        x. Vessel location (latitude/longitude, decimal degrees) when survey effort begins and ends; vessel location at beginning and end of visual PSO duty shifts; recorded at 30 second intervals if obtainable from data collection software, otherwise at practical regular interval
        xi. Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any change
        xii. Water depth (if obtainable from data collection software) (in meters)
        xiii. Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including wind speed and direction, Beaufort scale, Beaufort wind force, swell height (in meters), swell angle, precipitation, cloud cover, sun glare, and overall visibility to the horizon
        xiv. Factors that may be contributing to impaired observations during each PSO shift change or as needed as environmental conditions change (e.g., vessel traffic, equipment malfunctions)
        xv. Survey activity information, such as type of survey equipment in operation, acoustic source power output while in operation, and any other notes of significance (i.e., pre-clearance survey, ramp-up, shutdown, end of operations, etc.)
    b. Visual Sighting (all Visual Effort fields plus)
        i. Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform)
        ii. Vessel/survey activity at time of sighting
        iii. PSO/PSO ID who sighted the animal
        iv. Time of sighting
        v. Initial detection method
        vi. Sighting cue(s)
        vii. Vessel location at time of sighting (decimal degrees)
        viii. Direction of vessel's travel (compass direction)
        ix. Direction of animal's travel relative to the vessel

x. Identification of the animal (e.g., genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix of species

xi. Species reliability

xii. Radial distance

xiii. Distance method

xiv. Group size; Estimated number of animals (high/low/best)

xv. Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.)

xvi. Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics)

xvii. Detailed behavior observations (e.g., number of blows, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior)

xviii. Mitigation Action; Description of any actions implemented in response to the sighting (e.g., delays, shutdown, ramp-up, speed or course alteration, etc.) and time and location of the action

xix. Behavioral observation to mitigation

xx. Equipment operating during sighting

xxi. Source depth (in meters)

xxii. Source frequency

xxiii. Animal's closest point of approach and/or closest distance from the center point of the acoustic source

xxiv. Time entered shutdown zone

xxv. Time exited shutdown zone

xxvi. Time in shutdown zone

xxvii. Photos/Video

2. Community Offshore Wind will submit a final monitoring report to BOEM and NMFS (to renewable_reporting@boem.gov and nmfs.gar.esa.section7@noaa.gov) within 90 days after completion of survey activities. The report will fully document the methods and monitoring protocols, summarize the survey activities and the data recorded during monitoring, estimate the number of listed species that may have been taken during survey activities, describe, assess, and compare the effectiveness of monitoring and mitigation measures. PSO sightings and effort data and trackline data in Excel spreadsheet format must also be provided with the final monitoring report.

3. Reporting sightings of North Atlantic right whales:

   a. If a North Atlantic right whale is observed at any time by a PSO or Project personnel during surveys or vessel transit, sightings will be reported within two hours of occurrence when practicable and no later than 24 hours after occurrence. In the event of a sighting of a right whale that is dead, injured, or entangled, efforts will be made to make such reports as quickly as possible to the appropriate regional NOAA stranding hotline (from Maine-Virginia report sightings to 866-755-6622). Right whale sightings in any location may also be reported to the U.S. Coast Guard via channel 16 and through the WhaleAlert App (http://www.whalealert.org/).

   b. Further information on reporting a right whale sighting will be accessed at: https://apps-nefsc.fisheries.noaa.gov/psb/surveys/documents/20120919_Report_a_Right_Whale.pdf

4. In the event of a vessel strike of an ESA-listed species by any survey vessel, Community Offshore Wind will immediately report the incident to BOEM (renewable_reporting@boem.gov) and NMFS (nmfs.gar.incidental-take@noaa.gov) and the NOAA stranding hotline: from Maine-Virginia, report to 866-755-6622). The report will include the following information:
    a. Name, telephone, and email or the person providing the report
    b. The vessel name
    c. The Lease Number
    d. Time, date, and location (latitude/longitude) of the incident
    e. Species identification (if known) or description of the animal(s) involved
    f. Vessel's speed during and leading up to the incident
    g. Vessel's course/heading and what operations were being conducted (if applicable)
    h. Status of all sound sources in use
    i. Description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike
    j. Environmental conditions (wave height, wind speed, light, cloud cover, weather, water depth)
    k. Estimated size and length of animal that was struck
    l. Description of the behavior of the species immediately preceding and following the strike
    m. If available, description of the presence and behavior of any other protected species immediately preceding the strike
    n. Disposition of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, last sighted direction of travel, status unknown, disappeared)
    o. To the extent practicable, photographs or video footage of the animal(s)
5. Sightings of any injured or dead listed species will be immediately reported, regardless of whether the injury or death is related to survey operations, to BOEM (renewable_reporting@boem.gov), NMFS (nmfs.gar.incidental-take@noaa.gov), and the appropriate regional NOAA stranding hotline (from Maine-Virginia report sightings to 866-755-6622). If Community Offshore Wind's activity is responsible for the injury or death, Community Offshore Wind will ensure that the vessel assist in any salvage effort as requested by NMFS. When reporting sightings of injured or dead listed species, the following information will be included:
    a. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable)
    b. Species identification (if known) or description of the animal(s) involved
    c. Condition of the animal(s) (including carcass condition if the animal is dead)
    d. Observed behaviors of the animal(s), if alive
    e. If available, photographs or video footage of the animal(s)
    f. General circumstances under which the animal was discovered

14 Suggested Means of Coordination

No direct research on marine mammals is planned as part of the proposed surveys, but information gathered by PSOs during observation for implementing mitigation and monitoring requirements may provide useful data for future applications. This information can also inform a more refined understanding of marine mammal use in the Lease Area and ECR Area.

Overall, Community Offshore Wind's reports required as part of this permitting process will help inform marine mammal management and potential impacts of offshore wind survey activities. Community Offshore Wind will also report North Atlantic right whale sightings as quickly as practicable. Data will be shared with educational institutions and organizations as appropriate.

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Appendix A
Manufacturer Specifications for Survey Equipment

Appendix B
NMFS Spreadsheet Results for Distance to Level A Thresholds

COMMUNITY offshore wind

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Community Wind HRG Surveys
PROJECT/SOURCE INFORMATION	Geo-Source 200 - 400 Marine multi-tip sparker system (400 tip/500J) AND Applied Acoustics Dura-Spark UHD 400+400 (400 tip/300 - 1000J)
Please include any assumptions	
PROJECT CONTACT	Sarah Courbis/Melissa Snover

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)[¥]	1	NMFS recommended default value

SEISMIC METRIC CONVERSIONS

			Bars
			$L_{p,pk\text{-}pk}$
			#NUM!
Source Level ($L_{p,pk\text{-}pk}$)			
Source Level ($L_{p,0\text{-}pk}$)	-6	**Source Level ($L_{p,0\text{-}pk}$)**	
Source Level (L_{rms})	-12	**Source Level (L_{rms})**	-6
Source Level ($L_{E,p,\text{single shot}}$)	-22	**Source Level ($L_{E,p,\text{single shot}}$)**	-16

STEP 3: SOURCE-SPECIFIC INFORMATION

NOTE: METHOD F1 is PREFERRED method when SEL-based source levels are available (because pulse duration is not required). Only use method F2 if SEL-based source levels are not available.

F1: METHOD† TO CALCULATE PK and SEL_{cum} (SINGLE SHOT/PULSE EQUIVALENT) PREFERRED METHOD (pulse duration not needed)

SEL_{cum}	
Source Level ($L_{E,p,\text{single ping/pulse/shot}}$)	174
Source Velocity (meters/second)	2.06
1/Repetition rate^ (seconds)	0.25
Source Factor	1.00475E+18

PK	
Source Level ($L_{p,0\text{-}pk}$)	211

†Methodology assumes propagation loss of 20 log R; Activity duration (time) independent

^Time between onset of successive pulses (inverse of repetition rate or inter-pulse interval).

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS*

*Impulsive sounds have dual metric thresholds (SELcum & PK). Metric producing largest isopleth should be used.

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS SEL_{cum} Isopleth to threshold (meters)	**0.8**	**0.0**	**0.1**	**0.1**	**0.0**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**NA**	**NA**	**2.8**	**NA**	**NA**

"NA": PK source level is ≤ to the threshold for that marine mammal hearing group.

Source Name: Geo-Source 200 – 400 Sparker

INPUT VALUES (LEVEL B)	
Threshold Level	*160*
Source Level (dB)	*203*
Frequency (kHz)	*1*
Beamwidth (degree)	*180*
Water depth (m)	*60*

COMPUTED VALUES (LEVEL B)	DO NOT CHANGE
alpha (dB/km)	0.00882342
TL coefficient	20
Slant distance of threshold (m)	141
Vertical depth of threshold (m)	8.6373E-15
Horizontal threshold range (m)	141

Source Name: Applied Acoustics Dura-Spark

INPUT VALUES (LEVEL B)	
Threshold Level	*160*
Source Level (dB)	*203*
Frequency (kHz)	*1*
Beamwidth (degree)	*180*
Water depth (m)	*60*

COMPUTED VALUES (LEVEL B)	DO NOT CHANGE
alpha (dB/km)	0.00882342
TL coefficient	20
Slant distance of threshold (m)	141
Vertical depth of threshold (m)	8.6373E-15
Horizontal threshold range (m)	141

Appendix C
Mean Group Size Assessment

Table C1 Summary of group and individual numbers of sightings used to estimate group size in the Large Whales.

					Species - Large Whales											
Source	Year of Survey(s)	Survey Platform	Season	Location	Right Whale Groups	Right Whale Individuals	Humpback Whale Groups	Humpback Whale Individuals	Fin Whale Groups	Fin Whale Individuals	Sei Whale Groups	Sei Whale Individuals	Minke Whale Groups	Minke Whale Individuals	Sperm Whale Groups	Sperm Whale Individuals
Palka et al. 2017	2010-2013	Ship	Summer	Northeast	2	4	57	83	92	127	9	10	29	29	138	208
Palka et al. 2017	2010-2013	Ship	Summer	Southeast	1	1	1	1	5	8	---	---	---	---	52	126
Palka et al. 2017	2010-2013	Ship	Fall	Southeast	---	---	---	---	3	9	---	---	---	---	13	42
Palka et al. 2017	2010-2013	Aerial	Spring	Northeast	3	3	13	16	23	24	5	6	7	7	3	3
Palka et al. 2017	2010-2013	Aerial	Summer	Northeast	1	1	28	35	17	17	2	2	23	23	3	6
Palka et al. 2017	2010-2013	Aerial	Fall	Northeast	1	1	29	43	25	26	3	9	20	31	4	4
Palka et al. 2017	2010-2013	Aerial	Winter	Northeast	---	---	1	1	1	1	3	6	1	1	---	---
Palka et al. 2017	2010-2013	Aerial	Spring	Southeast	5	10	6	7	8	11	---	---	5	6	6	6
Palka et al. 2017	2010-2013	Aerial	Summer	Southeast	---	---	---	---	4	5	---	---	---	---	2	2
Palka et al. 2017	2010-2013	Aerial	Fall	Southeast	---	---	2	2	6	10	---	---	3	3	---	---
Palka et al. 2017	2010-2013	Aerial	Winter	Southeast	---	---	3	3	3	3	---	---	---	---	---	---
Palka et al. 2017	2014	Aerial	Spring	Southeast	2	2	3	5	2	4	---	---	2	2	2	2
Palka et al. 2017	2014	Aerial	Spring	Northeast	8	19	---	---	2	2	---	---	3	4	---	---
Palka et al. 2017	2014	Ship	Spring	Northeast	33	44	60	93	46	61	13	14	11	15	46	57
Palka et al. 2017	2014	Ship	Summer	Northeast	---	---	1	1	17	30	---	---	1	1	19	38
Palka et al. 2021	2015-2019	Ship	Summer	Northeast	2	4	157	370	345	533	20	28	32	32	298	491
Palka et al. 2021	2015-2019	Ship	Fall	Northeast	---	---	---	---	1	1	---	---	---	---	27	45
Palka et al. 2021	2015-2019	Ship	Spring	Southeast	---	---	45	76	34	48	28	33	8	11	38	55
Palka et al. 2021	2015-2019	Ship	Summer	Southeast	1	1	1	1	5	8	---	---	1	1	70	156
Palka et al. 2021	2015-2019	Ship	Fall	Southeast	---	---	---	---	3	9	---	---	---	---	12	38
Palka et al. 2021	2015-2019	Aerial	Spring	Northeast	9	9	13	20	25	36	13	33	10	11	---	---
Palka et al. 2021	2015-2019	Aerial	Summer	Northeast	1	1	68	88	31	31	5	6	60	65	---	---
Palka et al. 2021	2015-2019	Aerial	Fall	Northeast	3	3	75	101	55	60	6	12	37	52	---	---
Palka et al. 2021	2015-2019	Aerial	Winter	Northeast	4	9	7	10	4	4	2	5	5	5	---	---
Palka et al. 2021	2015-2019	Aerial	Spring	Southeast	1	5	8	9	16	21	---	---	11	14	7	7
Palka et al. 2021	2015-2019	Aerial	Summer	Southeast	---	---	---	---	5	7	---	---	---	---	3	3
Palka et al. 2021	2015-2019	Aerial	Fall	Southeast	---	---	3	6	6	10	---	---	3	3	---	---
Palka et al. 2021	2015-2019	Aerial	Winter	Southeast	1	2	2	2	1	2	---	---	1	1	---	---
CETAP 1982	1978-1981	Ship and	Year-roun	Atlantic	119	197	416	1054	734	2175	7	16	158	280	144	485
				Sum	197	316	999	2027	1519	3283	116	180	431	597	887	1774
				Mean Group Size	**1.6**		**2.0**		**2.2**		**1.6**		**1.4**		**2.0**	

Table C2 Summary of group and individual numbers of sightings used to estimate group size in small Whales/Dolphins.

					Species - Small Whales/Dolphins											
Source	Year of Survey(s)	Survey Platform	Season	Location	Risso's Dolphins Groups	Risso's Dolphins Individuals	Long-finned Pilot Whale Groups	Long-finned Pilot Whale Individuals	White-sided Dolphin Groups	White Sided Dolphin Individuals	Common Dolphin Groups	Common Dolphin Individuals	Spotted Dolphin Groups	Spotted Dolphin Individuals	Bottlenose Dolphin Groups	Bottlenose Dolphin Individuals
Palka et al. 2017	2010-2013	Ship	Summer	Northeast	224	1215	1	17	---	---	239	7967	46	1334	188	2014
Palka et al. 2017	2010-2013	Ship	Summer	Southeast	21	254	44	829	---	---	2	269	---	---	102	149
Palka et al. 2017	2010-2013	Ship	Fall	Southeast	5	44	35	467	---	---	---	---	---	---	35	695
Palka et al. 2017	2010-2013	Aerial	Spring	Northeast	11	33	3	4	37	366	5	49	---	---	34	176
Palka et al. 2017	2010-2013	Aerial	Summer	Northeast	1	15	2	3	25	408	16	672	---	---	3	51
Palka et al. 2017	2010-2013	Aerial	Fall	Northeast	18	143	8	45	13	315	64	1436	---	---	29	370
Palka et al. 2017	2010-2013	Aerial	Winter	Northeast	23	61	5	6	18	132	17	569	---	---	---	---
Palka et al. 2017	2010-2013	Aerial	Spring	Southeast	22	106	1	135	---	---	68	3229	32	481	219	2046
Palka et al. 2017	2010-2013	Aerial	Summer	Southeast	11	162	20	538	---	---	7	510	33	861	222	2760
Palka et al. 2017	2010-2013	Aerial	Fall	Southeast	1	5	16	268	---	---	3	89	22	234	146	1875
Palka et al. 2017	2010-2013	Aerial	Winter	Southeast	---	---	---	---	---	---	2	61	7	385	82	542
Palka et al. 2017	2014	Aerial	Spring	Southeast	3	26	4	43	---	---	31	1221	1	40	67	719
Palka et al. 2017	2014	Aerial	Spring	Northeast	---	---	---	---	24	162	---	---	---	---	4	50
Palka et al. 2017	2014	Ship	Spring	Northeast	24	112	60	396	31	328	103	2746	1	7	32	439
Palka et al. 2017	2014	Ship	Summer	Northeast	18	120	4	28	---	---	26	683	1	35	9	145
Palka et al. 2021	2015-2019	Ship	Summer	Northeast	486	3131	41	666	3	61	444	19802	60	1760	345	3865
Palka et al. 2021	2015-2019	Ship	Fall	Northeast	23	218	---	---	---	---	5	61	3	75	16	186
Palka et al. 2021	2015-2019	Ship	Spring	Southeast	18	91	44	312	27	261	63	1648	---	---	26	390
Palka et al. 2021	2015-2019	Ship	Summer	Southeast	26	292	---	---	---	---	6	575	76	2817	134	2352
Palka et al. 2021	2015-2019	Ship	Fall	Southeast	12	120	---	---	---	---	---	---	31	959	55	1213
Palka et al. 2021	2015-2019	Aerial	Spring	Northeast	14	34	6	7	62	536	8	215	---	---	38	256
Palka et al. 2021	2015-2019	Aerial	Summer	Northeast	22	249	18	86	82	929	223	5570	---	---	28	178
Palka et al. 2021	2015-2019	Aerial	Fall	Northeast	55	481	19	78	144	2675	223	5823	---	---	46	623
Palka et al. 2021	2015-2019	Aerial	Winter	Northeast	24	61	2	3	25	208	136	3558	---	---	7	36
Palka et al. 2021	2015-2019	Aerial	Spring	Southeast	36	207	---	---	---	---	125	6520	70	1346	466	4139
Palka et al. 2021	2015-2019	Aerial	Summer	Southeast	14	227	---	---	---	---	11	784	64	1259	312	3144
Palka et al. 2021	2015-2019	Aerial	Fall	Southeast	2	10	---	---	---	---	5	254	37	580	212	2233
Palka et al. 2021	2015-2019	Aerial	Winter	Southeast	8	105	---	---	---	---	36	1625	5	71	83	812
CETAP 1982	1978-1981	Ship and	ear-roun	Atlantic	183	3911	275	5190	190	10109	164	7674	67	4916	477	6466
				Sum	1305	11433	608	9121	681	16490	2032	73610	556	17160	3417	37924
				Mean Group Size	**8.8**		**15.0**		**24.2**		**36.2**		**30.9**		**11.1**	

Table C3 Summary of group and individual numbers of sightings used to estimate group size in Harbor Porpoise and Seals.

					Species - Small Whales/Dolphins									
Source	Year of Survey(s)	Survey Platform	Season	Location	Harbor Porpoise Groups	Harbor Porpoise Individuals	Seal Groups	Seal Individuals	Gray Seal Groups	Gray Seal Individuals	Harbor Seal Groups	Harbor Seal Individuals	Seals Combined Groups	Seals Combined Individuals
Palka et al. 2017	2010-2013	Ship	Summer	Northeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2017	2010-2013	Ship	Summer	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2017	2010-2013	Ship	Fall	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2017	2010-2013	Aerial	Spring	Northeast	125	175	88	117	---	---	---	---	205	322
Palka et al. 2017	2010-2013	Aerial	Summer	Northeast	347	1232	47	51	---	---	---	---	98	149
Palka et al. 2017	2010-2013	Aerial	Fall	Northeast	50	128	10	34	---	---	---	---	44	78
Palka et al. 2017	2010-2013	Aerial	Winter	Northeast	66	88	---	---	---	---	---	---	---	---
Palka et al. 2017	2010-2013	Aerial	Spring	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2017	2010-2013	Aerial	Summer	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2017	2010-2013	Aerial	Fall	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2017	2010-2013	Aerial	Winter	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2017	2014	Aerial	Spring	Southeast	2	3	---	---	---	---	---	---	---	---
Palka et al. 2017	2014	Aerial	Spring	Northeast	47	72	45	45	---	---	---	---	90	135
Palka et al. 2017	2014	Ship	Spring	Northeast	12	22	4	4	14	15	7	7	51	98
Palka et al. 2017	2014	Ship	Summer	Northeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Ship	Summer	Northeast	4	6	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Ship	Fall	Northeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Ship	Spring	Southeast	11	21	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Ship	Summer	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Ship	Fall	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Spring	Northeast	181	264	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Summer	Northeast	341	757	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Fall	Northeast	390	1547	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Winter	Northeast	135	258	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Spring	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Summer	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Fall	Southeast	---	---	---	---	---	---	---	---	---	---
Palka et al. 2021	2015-2019	Aerial	Winter	Southeast	---	---	---	---	---	---	---	---	---	---
CETAP 1982	1978-1981	Ship and	ear-roun	Atlantic	187	702	---	---	---	---	---	---	---	---
				Sum	1898	5275	194	251	14	15	7	7	215	273
				Mean Group Size	**2.8**		**1.3**		**1.1**		**1.0**		**1.3**	