WIND ENERGY COMMERCIAL AND RESEARCH LEASES ON THE CENTRAL ATLANTIC OUTER CONTINENTAL SHELF

BIOLOGICAL ANALYSIS

Prepared using IPaC

Generated by Megan O'Donnell (megan.odonnell@icf.com)

April 17, 2024

The purpose of this document is to assess the effects of the proposed project and determine whether the project may affect any federally threatened, endangered, proposed, or candidate species. If appropriate for the project, this document may be used as a biological assessment (BA), as it is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536 (c)).

In this document, any data provided by U.S. Fish and Wildlife Service is based on data as of September 28, 2023.

Prepared using IPaC version 6.107.0-rc5

WIND ENERGY COMMERCIAL AND RESEARCH LEASES ON THE CENTRAL ATLANTIC OUTER CONTINENTAL SHELF BIOLOGICAL ASSESSMENT

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1 DESCRIPTION OF THE ACTION

1.1 PROJECT NAME

Wind Energy Commercial and Research Leases on the Central Atlantic Outer Continental Shelf

1.2 EXECUTIVE SUMMARY

The purpose of the Proposed Action is to issue four commercial wind energy leases within three wind energy areas and granting of rights-of-way and rights-of-use and easement in the region of the Outer Continental Shelf of the Central Atlantic. The analysis does not consider construction and operation of any commercial wind power facilities, which would be evaluated if a lessee submits a Construction and Operations Plan (COP).

At this time, BOEM is not considering construction and operation of a wind energy facility on a lease that may be issued in the WEAs. If, after a lease is issued, a lessee proposes to construct a commercial wind energy facility, the lessee would be required to submit a COP to BOEM for review and approval. BOEM would then conduct a project-specific National Environmental Policy Act (NEPA) review and would initiate project-specific ESA consultation with FWS, which would include the lessee's proposed transmission line(s) to shore. During the NEPA review of a COP, BOEM will also analyze a "no-action" alternative. BOEM will use the project specific NEPA review to decide whether to approve, approve with modifications, or disapprove a lessee's COP pursuant to 30 CFR 585.638 T

Five federally listed sea turtles, four federally listed birds, one federally listed bat, one federally listed plant, one federally listed insect, one candidate insect, and one bat proposed to be federally listed as endangered under USFWS jurisdiction occur or potentially occur in all or portions of the Action Area, depending on the species and Project element. The piping plover, red knot, roseate tern, monarch butterfly, northern long-eared bat, and tricolored bat can fly considerable distances; therefore, BOEM assumes these species potentially occur within the offshore environment. The sea turtle species are addressed in the NMFS Literature Review attached as a supplemental document to this Biological Assessment. For the remaining species, the potential effects within the Action Area are unlikely as there are no onshore Project elements.

This BA is based upon BOEM’s experience with similar actions proposed in the Central Atlantic: On March 24, 2011, BOEM requested informal ESA Section 7 consultation with FWS for lease issuance and site assessment activities off New Jersey, Delaware, Maryland, and Virginia. On June 20, 2011, FWS concurred with BOEM’s determinations that the risk to the roseate tern, piping plover, Bermuda petrel, and red knot regarding lease issuance, associated site characterization, and site assessment activities was “small and insignificant” and, therefore, not likely to adversely affect the three ESA listed species and one candidate species. On February 12, 2014, BOEM requested informal consultation with FWS for lease issuance and site assessment activities off North Carolina, South Carolina, and Georgia. On March 17, 2014, FWS concurred with BOEM's determination that commercial wind lease issuance and site assessment activities on the Atlantic OCS may affect, but will not likely adversely affect the Bermuda petrel, black-capped petrel, Kirkland's warbler, roseate tern, piping plover, and red knot. On July 27, 2016, BOEM requested informal ESA Section 7 consultation with FWS for the construction, operation, and decommissioning of a single met tower off New York in what is now OCS-A 0512. On September 14, 2016, FWS concurred with BOEM’s not likely to adversely affect determination for roseate. On August 10, 2021, BOEM requested informal consultation with USFWS for lease and grant issuance and site assessment activities on the Atlantic OCS of the New York Bight. On March 15, 2021, USFWS concurred with BOEM’s determination that commercial wind lease issuance and site assessment activities would “not likely adversely affect” the Bermuda petrel, roseate tern, piping plover, and rufa red knot and a no effect determination for NLEB.

1.3 EFFECT DETERMINATION SUMMARY

SPECIES (COMMON NAME)	SCIENTIFIC NAME	LISTING STATUS	PRESENT IN ACTION AREA	EFFECT DETERMINATION
Black-capped Petrel	Pterodroma hasitata	Endangered	No	NE
Eastern Black Rail	Laterallus jamaicensis ssp. jamaicensis	Threatened	No	NE
Green Sea Turtle	Chelonia mydas	Threatened	No	NE
Hawksbill Sea Turtle	Eretmochelys imbricata	Endangered	No	NE
Kemp's Ridley Sea Turtle	Lepidochelys kempii	Endangered	No	NE
Leatherback Sea Turtle	Dermochelys coriacea	Endangered	No	NE
Loggerhead Sea Turtle	Caretta caretta	Threatened	No	NE
Monarch Butterfly	Danaus plexippus	Candidate	Excluded from analysis	Excluded from analysis
Northeastern Beach Tiger Beetle	Habroscelimorpha dorsalis dorsalis	Threatened	No	NE
Northern Long-eared Bat†. **This species or critical habitat is covered by a DKey.**	Myotis septentrionalis	Endangered		NE
Piping Plover	Charadrius melodus	Threatened	Yes	NLAA
Roseate Tern	Sterna dougallii dougallii	Endangered	Yes	NLAA
Rufa Red Knot	Calidris canutus rufa	Threatened	Yes	NLAA
Seabeach Amaranth	Amaranthus pumilus	Threatened	No	NE
Tricolored Bat	Perimyotis subflavus	Proposed Endangered	Excluded from analysis	Excluded from analysis

† This species or critical habitat has been analyzed through a Determination Key.

1.4 PROJECT DESCRIPTION

1.4.1 LOCATION

LOCATION
Delaware, Maryland, New Jersey, and Virginia

1.4.2 DESCRIPTION OF PROJECT HABITAT

The Action Area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The Action Area for the lease issuance and site characterization and assessment activities will include the extents of the three Wind Energy Areas (WEAs) on the Outer Continental Shelf (OCS) in the Central Atlantic offshore Delaware, Maryland, and Virginia. There are no onshore components.

1.4.3 PROJECT PROPONENT INFORMATION

Provide information regarding who is proposing to conduct the project, and their contact information. Please provide details on whether there is a Federal nexus.

REQUESTING AGENCY

Department of Interior

Bureau of Ocean Energy Management

FULL NAME

Megan O'Donnell

STREET ADDRESS

1902 Reston Metro Plaza

CITY	STATE	ZIP
Reston	VA	20190

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LEAD AGENCY

Lead agency is the same as requesting agency

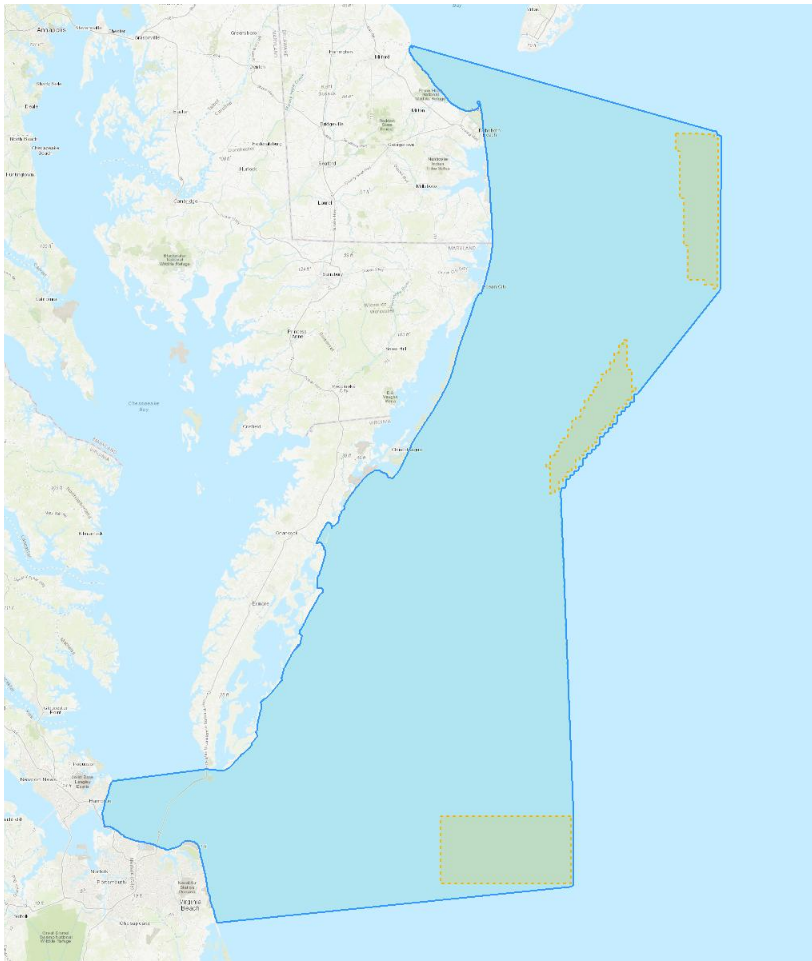
1.4.4 PROJECT PURPOSE

The purpose of the Proposed Action is to issue commercial leases within the WEAs and granting of rights-of-way (ROWs) and rights-of-use and easement (RUEs) in the region of the Outer Continental Shelf (OCS) of the Central Atlantic. BOEM's issuance of these leases and grants is needed to (1) confer the exclusive right to submit plans to BOEM for potential development, such that the lessees and grantees develop plans for BOEM's review and will commit to site characterization and site assessment activities necessary to determine the suitability of their leases and grants for commercial offshore wind production and/or transmission; and (2) impose terms and conditions intended to ensure that site characterization and assessment activities are conducted in a safe and environmentally responsible manner. The issuance of a lease by BOEM to the lessee conveys no right to proceed with development of a wind energy facility; the lessee acquires only the exclusive right to submit a plan to conduct this activity.

1.4.5 PROJECT TYPE AND DECONSTRUCTION

This project is a offshore wind commercial wind lease issuance project.

1.4.5.1 PROJECT MAP



LEGEND

Project footprint

Met Buoy Location: Install meteorological buoy

Surveys: Biological surveys (aerial), biological surveys (marine), conduct offshore geophysical survey, geotechnical investigation

1.4.5.2 BIOLOGICAL SURVEYS (AERIAL)

ACTIVITY START DATE

April 01, 2025

ACTIVITY END DATE

April 01, 2030

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

Plane-based aerial surveys may occur 2 days per month for 2 to 3 years within the aforementioned timing. Surveys would be conducted pursuant to BOEM (2020) Guidelines for Providing Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585 and would not noticeably increase aircraft traffic or noise levels within the Action Area.

BOEM acknowledges that while an individual Central Atlantic lessee may opt to carry out such biological surveys to characterize resources in their lease area to inform their COP development, there is not an affirmative requirement to carry out any biological surveys nor fisheries survey plans yet developed, thus any such surveys are not reasonably certain to occur and effects at this time are unknowable.

1.4.5.3 BIOLOGICAL SURVEYS (MARINE)

ACTIVITY START DATE
April 01, 2025

ACTIVITY END DATE
April 01, 2030

STRESSORS
This activity is not expected to have any impact on the environment.

DESCRIPTION
Biological surveys may be necessary to characterize the biological resources that could be affected by the proposed activity or could affect activities in the proposed plan. Benthic habitat, avian, bat, and marine fauna surveys may be expected as part of the Proposed Action.

BOEM acknowledges that while an individual Central Atlantic lessee may opt to carry out such biological surveys to characterize resources in their lease area to inform their COP development, there is not an affirmative requirement to carry out any biological surveys nor fisheries survey plans yet developed, thus any such surveys are not reasonably certain to occur and effects at this time are unknowable.

Biological survey activities include:

- Benthic habitat - Bottom sediment/fauna sampling and underwater imagery/sediment profile imaging. Surveys would occur concurrently with geotechnical surveys. Standard BOEM survey methods are detailed in Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585, Subpart F.
- Avian surveys - Visual surveys from boats. Up to 10 OCS survey blocks would be sampled in a single day on a monthly basis for 2 to 3 years. Standard BOEM survey methods are detailed in Guidelines for Providing Avian Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585.
- Bat surveys - Ultrasonic detection on survey vessels. Surveys would occur concurrently with vessels used for other biological surveys on an approximately monthly basis for three months of the year between March and November.
- Marine fauna - Vessel surveys for marine mammals, sea turtles, and fish. Surveys will occur over two years to capture spatial, temporal, and inter-annual variance in marine fauna populations potentially present within the Action Area. Standard BOEM survey methods are detailed in Guidelines for Providing Information on Marine Mammals and Sea Turtles for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585.

For biological surveys, BOEM assumes that all vessels associated with the Proposed Action would be required to abide by the Standard Operating Conditions (SOCs) for vessel activity. These conditions include but are not limited to avoidance of cultural resources and biologically sensitive habitats, informational training on proper debris storage and disposal practices, establishment of minimum separation distances between vessels and marine protected species, use of best available mooring systems, use of trained protected species observers, and reporting of any project-related reporting.

1.4.5.4 CONDUCT OFFSHORE GEOPHYSICAL SURVEY

ACTIVITY START DATE
April 01, 2025

ACTIVITY END DATE
April 01, 2030

STRESSORS
This activity is not expected to have any impact on the environment.

DESCRIPTION
High-resolution geophysical (HRG) survey data provides information on seafloor and sub-surface conditions as they pertain to the project siting and design. This includes shallow geologic and anthropogenic hazards, like the presence absence of archaeological resources. HRG data acquisition instrumentation used during surveys could add noise to the underwater environment. The line spacing for HRG surveys would vary depending on the data collection requirements of the different HRG survey types. The HRG survey equipment has numerous configurations (e.g., towed, pole mounted, hull mounted) but is typically deployed as a single source element, unlike other geophysical survey operations (e.g., oil and gas deep penetrating seismic exploration and mid-frequency active sonar military exercises), which use source arrays with multiple units or elements operating in unison.

BOEM assumes that, during site characterization, a lessee would survey potential offshore export cable routes (for connecting future wind turbines to an onshore power substation) from the WEA to shore using HRG survey methods. BOEM assumes that the HRG survey grids for a proposed offshore export cable route to shore would likely occur over a 1,000-m-wide corridor centered on the potential offshore export cable location to allow for anticipated physical disturbances and movement of the proposed cable, if necessary. Because it is not yet possible to predict precisely where an onshore electrical substation may ultimately be installed or the route that any potential future export cable would take across the seafloor from the WEA to shore, this analysis assumes direct routes from the middle (centroid) of each WEA to hypothetical potential interconnection points onshore in Delaware and Virginia. The hypothetical points were selected based on proximity from onshore points of interconnection to each WEA to conservatively approximate the level of surveys that may be conducted and number of samples that would be collected to characterize an offshore export cable route. The hypothetical points of interconnection used to approximate the level of surveys for the WEAs in no way represents proposed export cable routes.

1.4.5.5 GEOTECHNICAL INVESTIGATION

ACTIVITY START DATE
April 01, 2025

ACTIVITY END DATE
April 01, 2030

STRESSORS
This activity is not expected to have any impact on the environment.

DESCRIPTION
Geotechnical surveys are performed to assess the suitability of shallow sediments to support a structure foundation (i.e., gather information to determine whether the seabed can support foundation structures) or offshore export cables under operational and environmental conditions that could potentially be encountered (including extreme weather events), as well as to document the sediment characteristics necessary for design and installation of all structures and cables. Samples for geotechnical evaluation are typically collected using a combination of boring methods and in-situ methods taken from a survey vessel or drilling vessel. Survey methods may result in bottom disturbance as a result of physical seafloor sampling.

Geotechnical/benthic sampling of the WEAs would require a sample at every potential wind turbine location (which would only occur in the portion of the WEA where structural placement is allowed) and one sample per kilometer of offshore export cable corridor. The amount of effort and vessel trips required to collect the geotechnical samples varies greatly by the type of technology used to retrieve the sample The area of seabed disturbed by individual sampling events (e.g., collection of a core or grab sample) is estimated to range from 1 to 10 m2 (BOEM 2014a; Fugro Marine GeoServices Inc. 2017). Some vessels require anchoring for brief periods using small anchors; however, approximately 50% of deployments for this sampling work could involve a boat having dynamic positioning capability (i.e., no seafloor anchoring impacts) (BOEM 2014a).

1.4.5.6 INSTALL METEOROLOGICAL BUOY

ACTIVITY START DATE
April 01, 2025

ACTIVITY END DATE
April 01, 2030

STRESSORS
This activity is not expected to have any impact on the environment.

DESCRIPTION
Installation, operation and maintenance, and decommissioning of meteorological (met) buoys for characterizing wind conditions are part of the assumptions/scenario for the Proposed Action. Met buoys are anchored to the seafloor at fixed locations and regularly collect observations from many different atmospheric and oceanographic sensors. This analysis assumes that a maximum of two buoys per lease would be installed; thus, with an assumed four leases within the three WEAs, a total of eight buoys are considered (two met buoys per lease area). The choice of buoy type used usually depends on its intended installation location and measurement requirements. For example, a smaller buoy in shallow coastal waters may be moored using an all-chain mooring. On the OCS, a larger discus-type or boat-shaped hull buoy may require a combination of a chain, nylon, and buoyant polypropylene materials designed for many years of ocean service.

Buoys are towed or carried aboard a vessel to the installation location and either lowered to the ocean surface from the deck of the vessel or placed over the final location and the mooring anchor is dropped. Anchors for boat-shaped or discus-shaped buoys would likely weigh about 2,721 to 4,536 kilograms (kg), with a footprint of about 0.5 m2 and an anchor chain sweep of about 34,398 m2 (BOEM 2014a; Fugro Marine GeoServices Inc. 2017). Transport and installation vessel anchoring for 1 day is anticipated for these types of buoys. For spar-type buoys, installation would occur in two phases. Phase one would occur over 1 day, and the clump anchor would be transported and deployed to the seabed. In phase two, which would take place over 2 days, the spar_buoy would be similarly transported and then crane lifted into the water. Divers would secure it to the clump anchor (which weighs a minimum of 100 tons). Previous proposals have indicated that the maximum area of disturbance related to deployment of a spar-buoy occurs during anchor deployment/removal, resulting in a maximum area of disturbance of 118 m2 of seafloor between its clump anchor and mooring chain (BOEM 2014a).

On-site inspections and preventative maintenance (i.e., marine fouling, wear, or lens cleaning) are expected to occur on a monthly or quarterly basis for met buoys. Periodic inspections for specialized components (i.e., buoy, hull, anchor chain, or anchor scour) would occur at different intervals but would likely coincide with the monthly or quarterly inspection to minimize the need for additional boat trips to the site.

Decommissioning is basically the reverse of the installation process. Equipment recovery would be performed with the support of a vessel(s) equivalent in size and capability to that used for installation. Buoy decommissioning is expected to be completed within 1 to 2 days depending on buoy type. Site clearance activities are also a part of decommissioning obligations and requirements pursuant to 30 CFR §585.906(e)and 30 CFR §585.910(b). The lessee must remove any trash or bottom debris introduced as a result of operations and document that the lease area is clear; such evidence may consist of one or more of the following: photographic bottom survey, site clearance, high-resolution side-scan survey, or sector-scanning sonar survey.

1.4.6 ANTICIPATED ENVIRONMENTAL STRESSORS

Describe the anticipated effects of your proposed project on the aspects of the land, air and water that will occur due to the activities above. These should be based on the activity deconstructions done in the previous section and will be used to inform the action area.

1.4.6.1 ANIMAL FEATURES

Individuals from the Animalia kingdom, such as raptors, mollusks, and fish. This feature also includes byproducts and remains of animals (e.g., carrion, feathers, scat, etc.), and animal-related structures (e.g., dens, nests, hibernacula, etc.).

1.4.6.2 PLANT FEATURES

Individuals from the Plantae kingdom, such as trees, shrubs, herbs, grasses, ferns, and mosses. This feature also includes products of plants (e.g., nectar, flowers, seeds, etc.).

1.4.6.3 ENVIRONMENTAL QUALITY FEATURES

Abiotic attributes of the landscape (e.g., temperature, moisture, slope, aspect, etc.).

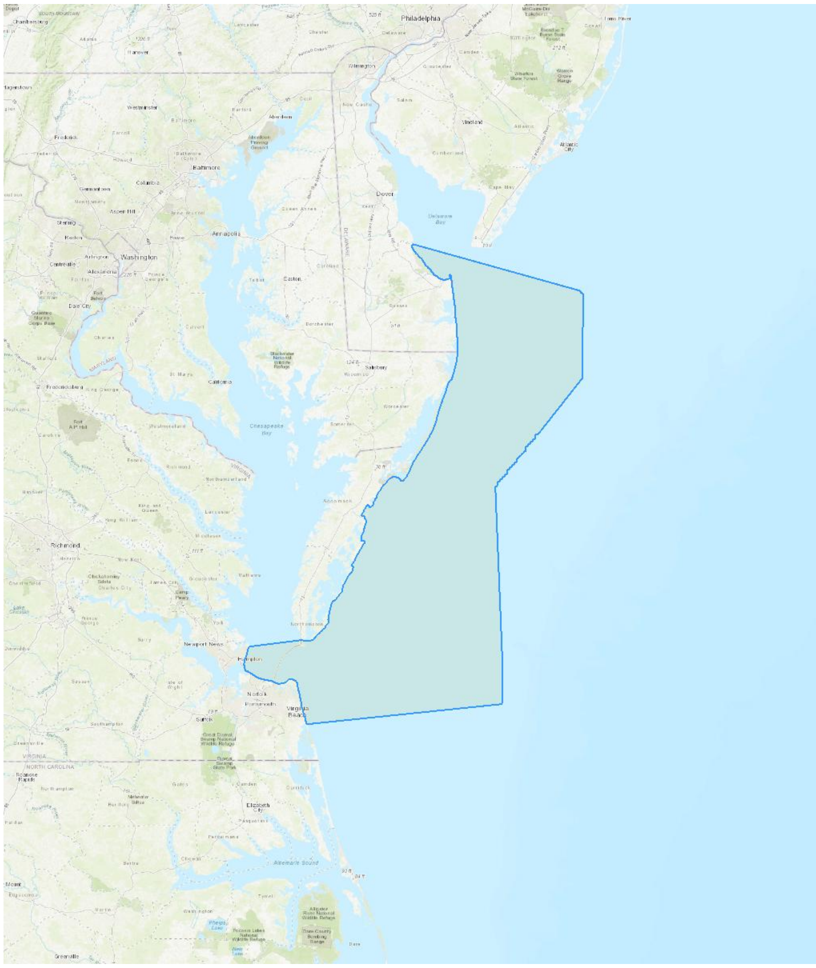
1.4.6.4 LANDFORM (TOPOGRAPHIC) FEATURES

Topographic (landform) features that typically occur naturally on the landscape (e.g., cliffs, terraces, ridges, etc.). This feature does not include aquatic landscape features or man-made structures.

1.4.6.5 SOIL AND SEDIMENT

The topmost layer of earth on the landscape and its components (e.g., rock, sand, gravel, silt, etc.). This feature includes the physical characteristics of soil, such as depth, compaction, etc. Soil quality attributes (e.g, temperature, pH, etc.) should be placed in the Environmental Quality Features.

1.5 ACTION AREA



LEGEND

Project footprint

Stressor location

1.6 CONSERVATION MEASURES

1.6.1 OSRP

DESCRIPTION
The OSRP provides clear notification and activation procedures and identifies shore-based resources to respond to an oil spill or the substantial threat of an oil discharge from any relevant sources associated with the proposed action. An OSRP will be developed by lessees prior to the initiation of any survey or exploration activity within the Action Area.

1.6.2 AVOIDANCE OF SENSITIVE HABITAT

DESCRIPTION
In collaboration with local regulatory agencies, USFWS, and NMFS, BOEM will identify sensitive habitat areas within the Action Areas, including but not limited to corals, bird breeding areas, and important foraging areas. BOEM will establish and require lessees to administer relevant standoff distances from these areas and resources.

1.6.3 LIGHTING MINIMIZATION

DESCRIPTION
Vessels associated with the Proposed Action will limit onboard lighting to the extent practicable while complying with required USCG safety-related lighting requirements.

1.6.4 TRAINED SPECIES OBSERVERS

DESCRIPTION
All vessels associated with the Proposed Action will include trained species observers to monitor for special status species during activities. These observers will ensure that vessels comply with minimum separation distances from special status species and report incidents to relevant regulatory authorities if they arise.

1.7 PRIOR CONSULTATION HISTORY

On March 24, 2011, BOEM requested informal ESA Section 7 consultation with FWS for lease issuance and site assessment activities off New Jersey, Delaware, Maryland, and Virginia. On June 20, 2011, FWS concurred with BOEM’s determinations that the risk to the roseate tern, piping plover, Bermuda petrel, and red knot regarding lease issuance, associated site characterization, and site assessment activities was “small and insignificant” and, therefore, not likely to adversely affect the three ESA listed species and one candidate species.

Please see the FWS letter of concurrence here: https://www.boem.gov/sites/default/files/documents/renewable-energy/Ltr_from_FWS_re_BA_NJ_DE_MD_VA.pdf

1.8 OTHER AGENCY PARTNERS AND INTERESTED PARTIES

N/A

1.9 OTHER REPORTS AND HELPFUL INFORMATION

The relevant documents include:

1. Draft Environmental Assessment
2. NMFS Literature Review

2 SPECIES EFFECTS ANALYSIS

This section describes, species by species, the effects of the proposed action on listed, proposed, and candidate species, and the habitat on which they depend. In this document, effects are broken down as direct interactions (something happening directly to the species) or indirect interactions (something happening to the environment on which a species depends that could then result in effects to the species).

These interactions encompass effects that occur both during project construction and those which could be ongoing after the project is finished. All effects, however, should be considered, including effects from direct and indirect interactions and cumulative effects.

2.1 BLACK-CAPPED PETREL

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore. Therefore, no effects to Black-capped Petrels or their habitat are expected to occur as a result of the Proposed Action.

2.2 EASTERN BLACK RAIL

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore. Therefore, no effects to Eastern Black Rail or their habitat are expected to occur as a result of the Proposed Action.

2.3 GREEN SEA TURTLE

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore and would not affect nesting turtles, hatchlings, or onshore habitat. Potential marine impacts to Green Sea Turtles are covered under programmatic consultation with National Marine Fisheries Service (NMFS) completed on June 29, 2021.

2.4 HAWKSBILL SEA TURTLE

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore and would not affect nesting turtles, hatchlings, or onshore habitat. Potential marine impacts to Hawksbill Sea Turtles are covered under programmatic consultation with NMFS completed on June 29, 2021.

2.5 KEMP'S RIDLEY SEA TURTLE

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore and would not affect nesting turtles, hatchlings, or onshore habitat. Potential marine impacts to Kemp's Ridley Sea Turtles are covered under programmatic consultation with NMFS completed on June 29, 2021.

2.6 LEATHERBACK SEA TURTLE

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore and would not affect nesting turtles, hatchlings, or onshore habitat. Potential marine impacts to Leatherback Sea Turtles are covered under programmatic consultation with NMFS completed on June 29, 2021.

2.7 LOGGERHEAD SEA TURTLE

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore and would not affect nesting turtles, hatchlings, or onshore habitat. Potential marine impacts to Leatherback Sea Turtles are covered under programmatic consultation with NMFS completed on June 29, 2021.

2.8 MONARCH BUTTERFLY

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Monarch butterflies have been documented offshore on oil platforms in the Gulf of Mexico, 72 miles south of the Louisiana coastline potentially utilizing the structures as a safe haven to cross from Louisiana to northeastern Mexico each fall (Ross 1998). Although monarchs are far-ranging fliers, they are easily blown off course, likely by storms, into offshore waters. Therefore, because the occurrence of monarch butterflies in the offshore portions of the Action Area is anticipated to be very rare, potential collisions are extremely unlikely to occur (*discountable*) and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*).

2.9 NORTHEASTERN BEACH TIGER BEETLE

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore. Therefore, no effects to Northeastern Beach Tiger Beetle or their habitat are expected to occur as a result of the Proposed Action

2.10 PIPING PLOVER

2.10.1 STATUS OF THE SPECIES

This section should provide information on the species' background, its biology and life history that is relevant to the proposed project within the action area that will inform the effects analysis.

2.10.1.1 LEGAL STATUS

The Piping Plover is federally listed as 'Threatened' and additional information regarding its legal status can be found on the ECOS species profile.

2.10.1.2 RECOVERY PLANS

Available recovery plans for the Piping Plover can be found on the ECOS species profile.

2.10.1.3 LIFE HISTORY INFORMATION

Size: 18 cm (7.25 in) in length. Color: Breeding season: Pale brown above, lighter below; black band across forehead; bill orange with black tip; legs orange; white rump. Male: Complete or incomplete black band encircles the body at the breast. Female: Paler head band; incomplete breast band. Winter coloration: Bill black; all birds lack breast band and head band.

IDENTIFIED RESOURCE NEEDS

Beaches

Multiple types

Invertebrates

Type: freshwater, marine, and terrestrial invertebrates and type: small invertebrates: crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods

Mud and algal flats

Type: absent or sparse vegetation

Sandbar

Substrate structure and characteristics

Type: debris (wrack) - organic materials such as driftwood, seashells, or seaweed and type: sand, sand and shell, gravel

Vegetation density

Percent cover: less than 50%

2.10.1.4 CONSERVATION NEEDS

Coastal development is the primary anthropogenic threat to piping plovers, which results in lost habitat. Other threats include disturbance by humans, dogs, and vehicles on sandy beaches and dune habitats (Elliott-Smith and Haig 2004; USFWS 2009). Currently, the range-wide status of the Atlantic Coast piping plover is stable to increasing. However, productivity rates continue to fall short of the recovery criterion, and range-wide population growth is tempered by geographic and temporal variability (USFWS 2022a). Overall, the Atlantic coast piping plover population has increased 190 percent from a low of 790 breeding pairs in 1986 to an estimated 2,289 breeding pairs in 2021 (USFWS 2022). Although population growth, from approximately 957 pairs in 1989 to an estimated 2,289 pairs in 2021, has reduced the Atlantic Coast piping plover's vulnerability to extinction since listing under the ESA, the distribution of population growth remains very uneven. Declines of 32 percent in the Eastern Canada breeding population since 2007 and 30 percent in the Southern recovery unit in just the last 5 years typify long-standing concerns about the uneven distribution of Atlantic Coast piping plovers (Hecht and Melvin 2009, USFWS 2009, USFWS 2020). The piping plover is among 72 species (out of 177 species on the Atlantic OCS) that ranked moderate in its relative vulnerability to collision with wind turbines (Robinson Willmott et al. 2013).

2.10.2 ENVIRONMENTAL BASELINE

*The environmental baseline describes the species' health **within the action area only** at the time of the consultation, and does not include the effects of the action under review. Unlike the species information provided above, the environmental baseline is at the scale of the Action area.*

2.10.2.1 SPECIES PRESENCE AND USE

Piping plovers are present in Delaware and Virginia during their breeding season and spring and fall migratory seasons which occur from late March through mid-October. The Maryland Natural Heritage Program (2021) notes that the only piping plover breeding in the state occurs on Assateague Island. Net growth in the Southern piping plover recovery unit population was 35 percent between 1989 and 2021. Most of the Southern recovery unit (DE, MD, VA, NC, SC) breeding population increase occurred in 2003 to 2005 and 2011 to 2012, and the population decreased 30 percent between 2016 and 2021. In 2021 there were an estimated 24 breeding pairs in Delaware, 22 pairs in Maryland, and 183 pairs in Virginia (USWFS 2022). The modeled piping plover migration trajectories from Loring et al. (2020) indicated that the birds migrate offshore directly across the mid-Atlantic Bight from their northern breeding grounds to southern migration destinations, which could place them within the Action Areas for this BA. The detection limitations and coarse spatial modeling from the study are not sufficient to assert that migration occurs in all of the Action Areas; however, there were a couple of piping plovers recently detected by automated receivers on turbines CVOW-pilot project (unpublished data).

2.10.2.2 SPECIES CONSERVATION NEEDS WITHIN THE ACTION AREA

Coastal development is the primary anthropogenic threat to piping plovers, which results in lost habitat. Other threats include disturbance by humans, dogs, and vehicles on sandy beaches and dune habitats (Elliott-Smith and Haig 2004; USFWS 2009). Currently, the range-wide status of the Atlantic Coast piping plover is stable to increasing. However, productivity rates continue to fall short of the recovery criterion, and range-wide population growth is tempered by geographic and temporal variability (USFWS 2022a). Overall, the Atlantic coast piping plover population has increased 190 percent from a low of 790 breeding pairs in 1986 to an estimated 2,289 breeding pairs in 2021 (USFWS 2022). Although population growth, from approximately 957 pairs in 1989 to an estimated 2,289 pairs in 2021, has reduced the Atlantic Coast piping plover's vulnerability to extinction since listing under the ESA, the distribution of population growth remains very uneven. Declines of 32 percent in the Eastern Canada breeding population since 2007 and 30 percent in the Southern recovery unit in just the last 5 years typify long-standing concerns about the uneven distribution of Atlantic Coast piping plovers (Hecht and Melvin 2009, USFWS 2009, USFWS 2020). The piping plover is among 72 species (out of 177 species on the Atlantic OCS) that ranked moderate in its relative vulnerability to collision with wind turbines (Robinson Willmott et al. 2013).

2.10.2.3 HABITAT CONDITION (GENERAL)

Piping plover breeding habitat consists of generally undisturbed, sparsely vegetated, flat, sand dune–beach habitats such as coastal beaches, gently sloping foredunes, sandflats, and washover areas to which they are restricted (USFWS 1996, 2009). Nest sites are shallow, scraped depressions in a variety of substrates situated above the high-tide line (USFWS 1996). Piping plovers forage in the intertidal zone. Foraging habitat includes intertidal portions of ocean beaches, washover areas, mudflats, and sandflats, as well as shorelines of coastal ponds, lagoons, and saltmarshes where they feed on beetles, crustaceans, fly larvae, marine worms, and mollusks (USFWS 1996).

2.10.2.4 INFLUENCES

Coastal development is the primary anthropogenic threat to piping plovers, which results in lost habitat. Other threats include disturbance by humans, dogs, and vehicles on sandy beaches and dune habitats (Elliott-Smith and Haig 2004; USFWS 2009). Currently, the range-wide status of the Atlantic Coast piping plover is stable to increasing. However, productivity rates continue to fall short of the recovery criterion, and range-wide population growth is tempered by geographic and temporal variability (USFWS 2022a). Overall, the Atlantic coast piping plover population has increased 190 percent from a low of 790 breeding pairs in 1986 to an estimated 2,289 breeding pairs in 2021 (USFWS 2022). Although population growth, from approximately 957 pairs in 1989 to an estimated 2,289 pairs in 2021, has reduced the Atlantic Coast piping plover's vulnerability to extinction since listing under the ESA, the distribution of population growth remains very uneven. Declines of 32 percent in the Eastern Canada breeding population since 2007 and 30 percent in the Southern recovery unit in just the last 5 years typify long-standing concerns about the uneven distribution of Atlantic Coast piping plovers (Hecht and Melvin 2009, USFWS 2009, USFWS 2020). The piping plover is among 72 species (out of 177 species on the Atlantic OCS) that ranked moderate in its relative vulnerability to collision with wind turbines (Robinson Willmott et al. 2013).

2.10.2.5 ADDITIONAL BASELINE INFORMATION

The breeding range of the Atlantic coast population includes the Atlantic coast of North America from Canada to North Carolina. The piping plover breeding season extends from April through August, with piping plovers arriving at breeding locations in mid-March and into April. In spring, adult Atlantic coast piping plovers arrive at breeding locations beginning in mid-March and nest from April through August. Post-breeding staging in preparation for migration extends from late July through September, rarely into October (USFWS 1996; Loring et al. 2020a). Piping plover breeding habitat consists of generally undisturbed, sparsely vegetated, flat, sand dune–beach habitats such as coastal beaches, gently sloping foredunes, sandflats, and washover areas to which they are restricted (USFWS 1996, 2009). Nest sites are shallow, scraped depressions in a variety of substrates situated above the high-tide line (USFWS 1996). Piping plovers forage in the intertidal zone. Foraging habitat includes intertidal portions of ocean beaches, washover areas, mudflats, and sandflats, as well as shorelines of coastal ponds, lagoons, and saltmarshes where they feed on beetles, crustaceans, fly larvae, marine worms, and mollusks (USFWS 1996).

Loring et al. 2020b reported that “Most Piping Plovers initiated migration during the post-breeding period in mid- to late July, within 3 hr of local sunset, when winds were blowing to the southwest. These wind conditions supported direct, offshore flights from breeding areas in southern New England to stopover areas in the mid-Atlantic.” The study modeled migration trajectories and concluded that “Piping Plovers migrated offshore directly across the mid-Atlantic Bight, from breeding areas in southern New England to stopover sites spanning from New York to North Carolina, USA, over 800 km away.” However, the authors noted that the study’s design, “…attempted to maximize the detection range and directionality of land-based towers but had limited coverage for detecting birds in offshore areas of the U.S. Atlantic OCS beyond 20 km from land.” Similar to other shorebirds, piping plovers either make nonstop long-distance migratory flights (Normandeau Associates, Inc. 2011) or offshore migratory “hops” between coastal areas (Loring et al. 2020b).

2.10.3 EFFECTS OF THE ACTION

This section considers and discusses all effects on the listed species that are caused by the proposed action and are reasonably certain to occur, including the effects of other activities that would not occur but for the proposed action.

2.10.3.1 INDIRECT INTERACTIONS

As part of your project description, you identified that there are no anticipated environmental stressors resulting from your proposed project. Because there are no stressors occurring, no resource needs will be exposed to or affected by changes in the environment. Therefore, no indirect interactions will occur that would result in effects to the Piping Plover.

2.10.3.2 DIRECT INTERACTIONS
No direct interactions leading to effects on species are expected to occur from the proposed project.

2.10.4 CUMULATIVE EFFECTS
Reasonably foreseeable planned actions, which are discussed below, include eight types of actions: (1) other wind energy development activities, such as site characterization surveys; site assessment activities; and construction, operation, and decommissioning of wind energy facilities; (2) hydrokinetic projects; (3) undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); (4) marine minerals use and ocean dredged material disposal; (5) military use; (6) marine transportation; (7) fisheries use and management; and (8) global climate change. These actions would result in increased vessel presence and traffic within the Action Area, which would in turn result in the following stressors to Piping Plover:

- Associated noise air emissions, lighting, vessel discharges;
- Strikes and spills; and
- Increased aircraft traffic from biological surveys and associated noise, lighting, and air emissions.

However, increase in vessel activity as a result of the reasonably foreseeable actions is not expected to substantially increase the overall level of vessel traffic within the Action Area. As such, when considered in conjunction with the Proposed Action, cumulative effects are not expected to measurably affect Piping Plover populations within the Action Area.

2.10.5 DISCUSSION AND CONCLUSION

DETERMINATION: NLAA

COMPENSATION MEASURES
N/A

2.11 ROSEATE TERN

2.11.1 STATUS OF THE SPECIES
This section should provide information on the species' background, its biology and life history that is relevant to the proposed project within the action area that will inform the effects analysis.

2.11.1.1 LEGAL STATUS

The Roseate Tern is federally listed as 'Endangered' and additional information regarding its legal status can be found on the ECOS species profile.

2.11.1.2 RECOVERY PLANS

Available recovery plans for the Roseate Tern can be found on the ECOS species profile.

2.11.1.3 LIFE HISTORY INFORMATION

The roseate tern is about 40 centimeters in length, with light-gray wings and back. Its first three or four primaries are black and so is its cap. The rest of the body is white, with a rosy tinge on the chest and belly during the breeding season. The tail is deeply forked, and the outermost streamers extend beyond the folded wings when perched. During the breeding season the basal three-fourths of the otherwise entirely black bill and legs turn orange-red.

IDENTIFIED RESOURCE NEEDS

Coastal islands

Time of year: april-september and type: active common tern breeding colony

Coastal shore

Type: flat, sandy and type: sandbar, tidal sand flat, beach, shoal

Coastal tidal zone

Type: intertidal zone, subtidal zone and type: shallow water area (<10m), submerged sandbar, submerged shoal, submerged mudflat

Common tern flock

Time of year: april-september and type: active common tern breeding colony

Fish

Species: american sand lance (ammodytes americanus) and other small schooling marine fish

Sandbar

Type: sandbar, tidal sand flat, beach, shoal

Substrate structure and characteristics

Location: coastal island breeding colony, substrate size: coarse, time of year: april-september, type: rocks, boulders, driftwood, wooden boards, revetments, nest boxes, tires, drebris, type: sand, sand and shell, and gravel

Vegetation density

Density: 80%, location: coastal island breeding colony, spatial arrangement: clumped, species: native coastal, and time of year: april - september

Vegetation structure

Multiple types

2.11.1.4 CONSERVATION NEEDS

The northeastern roseate tern population breeds on small islands or on sand dunes at the ends of barrier beaches along the Atlantic coast, occurring in mixed colonies with common terns (*Sterna hirundo*). The population is currently restricted to a small number of colonies on predator-free islands from Nova Scotia to Long Island, New York, with over 90 percent of remaining individuals breeding at just three colony locations (Bird Island and Ram Island in Buzzards Bay, Massachusetts, and Great Gull Island in Long Island Sound, New York) (Nisbet et al. 2014; Loring et al. 2019; USFWS 2020b). Historically, the northeastern roseate tern population was known to breed as far south as Virginia, but the species currently does not breed south of Long Island, New York (USFWS 1998). Declines have been attributed largely to low productivity, partially related to predators and habitat loss and degradation, although adult survival is also unusually low for a tern species (USFWS 2010b). A recent USFWS 5-year review has shown that the historical population size in northeastern North America was estimated at 8,500 pairs in the 1930s (USFWS 2020b). In 2019, the range-wide breeding population was estimated at 4,374 breeding pairs at peak period count. Since 2016 the U.S. roseate tern breeding population has exceeded 4,000 breeding pairs annually.

2.11.2 ENVIRONMENTAL BASELINE

The environmental baseline describes the species' health ***within the action area only*** *at the time of the consultation, and does not include the effects of the action under review. Unlike the species information provided above, the environmental baseline is at the scale of the Action area.*

2.11.2.1 SPECIES PRESENCE AND USE

As noted in the most recent 5-year review for the roseate tern (USFWS 2020b), “The breeding range of the species has not changed since the 2010 review which documented substantial contraction of the southern part of the breeding range since historic times. Roseate terns no longer breed in Virginia, Maryland, New Jersey, and western and central Long Island (Nisbet et al. 2014) due to a combination of factors including increased predation,disturbance, erosion, and changes in habitat structure.” Loring et al. (2019, Table 14) estimated zero exposure events for roseate terns within the Delaware, Maryland, and Virginia BOEM lease areas during breeding and post-breeding dispersal between 2015-2017.

2.11.2.2 SPECIES CONSERVATION NEEDS WITHIN THE ACTION AREA

The northeastern roseate tern population breeds on small islands or on sand dunes at the ends of barrier beaches along the Atlantic coast, occurring in mixed colonies with common terns (*Sterna hirundo*). The population is currently restricted to a small number of colonies on predator-free islands from Nova Scotia to Long Island, New York, with over 90 percent of remaining individuals breeding at just three colony locations (Bird Island and Ram Island in Buzzards Bay, Massachusetts, and Great Gull Island in Long Island Sound, New York) (Nisbet et al. 2014; Loring et al. 2019; USFWS 2020b). Historically, the northeastern roseate tern population was known to breed as far south as Virginia, but the species currently does not breed south of Long Island, New York (USFWS 1998). Declines have been attributed largely to low productivity, partially related to predators and habitat loss and degradation, although adult survival is also unusually low for a tern species (USFWS 2010b). A recent USFWS 5-year review has shown that the historical population size in northeastern North America was estimated at 8,500 pairs in the 1930s (USFWS 2020b). In 2019, the range-wide breeding population was estimated at 4,374 breeding pairs at peak period count. Since 2016 the U.S. roseate tern breeding population has exceeded 4,000 breeding pairs annually.

2.11.2.3 HABITAT CONDITION (GENERAL)

Roseate tern foraging behavior and ecology are well described. Roseate terns dive less than 1.6 feet (0.5 meter) into the water to forage primarily for the inshore sand lance (*Ammodytes americanus*) in shallow, warmer waters near shoals, inlets, and rip currents close to shore (Safina 1990; Heinemann 1992; Rock et al. 2007). Roseate tern foraging flights are slow and range from 3 to 12 meters (10 to 39 feet) above the ocean surface. During the breeding season, most terns from colonies on Great Gull Island and Buzzards Bay forage relatively close to their colonies, but some do travel along the coast to other nearshore foraging sites (Loring 2016; Loring et al. 2019). As described in Gochfield and Burger (2020), "Roseate Terns forage inshore over shallow sandbars, shoals, inlets, or schools of predatory fish, often in mixed flocks with other terns and noddies (Safina 1990a, Safina 1990b, Heinemann 1992a, Shealer and Burger Shealer and Burger 1993, Shealer and Zurovchak 1995); they also feed pelagically over schools of predatory fish (Goyert 2013)." Shipboard surveys conducted from 2006 through 2009 for the Ecosystems Monitoring Survey provided data on the foraging behavior of roseate terns on the northeastern U.S. continental shelf. Roseate terns were found to exhibit facilitative interactions with sub-surface marine predators as a positive spatial and behavioral association was found between foraging roseate terns and tunas (Goyert et al. 2014).

The inshore sand lance is the primary forage fish for roseate terns and is a small to medium size fish (1.9 to 6.6 inches; 49 to 168 millimeters) chiefly found in shallow coastal waters and estuaries less than 7 feet (<2 meters) deep and are not found offshore (Collette and Klein-MacPhee 2002). The average size of inshore sand lance delivered by roseate terns to chicks is 2.3 inches (59 millimeters) (Safina et al. 1990). This is in contrast to the offshore sand lance (*A. dubius*) which is larger 3 to 10 inches (77 to 253 millimeters) and found offshore, particularly in Nantucket Shoals and over the shallows of Georges and Browns Banks. and the offshore sand lance stays on the bottom during the day (Collette and Klein-MacPhee 2002).

2.11.2.4 INFLUENCES

Historically, the northeastern roseate tern population was known to breed as far south as Virginia, but the species currently does not breed south of Long Island, New York (USFWS 1998). Declines have been attributed largely to low productivity, partially related to predators and habitat loss and degradation, although adult survival is also unusually low for a tern species (USFWS 2010b). A recent USFWS 5-year review has shown that the historical population size in northeastern North America was estimated at 8,500 pairs in the 1930s (USFWS 2020b). In 2019, the range-wide breeding population was estimated at 4,374 breeding pairs at peak period count. Since 2016 the U.S. roseate tern breeding population has exceeded 4,000 breeding pairs annually.

2.11.2.5 ADDITIONAL BASELINE INFORMATION

The northeastern roseate tern population generally migrates through the Mid-Atlantic to and from its wintering grounds on the northeastern coast of Brazil, arriving at its northwest Atlantic breeding colonies in late April to late May, with nesting occurring between mid-May and late July. During breeding, roseate terns generally stay within about 6 miles (10 kilometers) of the colony, although they may travel 20 to 30 miles (32 to 48 kilometers) from the colony while feeding chicks (USFWS 2010b; Burger et al. 2011; Nisbet et al. 2014; Loring et al. 2019). Following the breeding season, adult and hatch-year roseate terns move to post-breeding coastal staging areas from approximately late July to mid-September (USFWS 2010b). Foraging activity during the staging period is known to occur up to 10 miles (16 kilometers) off the coast, although most foraging activity occurs much closer to shore (Burger et al. 2011). Recent very high frequency (VHF) and geolocator data suggest roseate terns migrate in late August to mid-September from staging areas to their wintering range. A recent study tagged six roseate terns in Bird Island, Massachusetts and found that geolocator data suggests roseate terns exhibit southbound migration flight paths, which are transoceanic until reaching the Caribbean where a stopover period may occur (USFWS 2020b).

2.11.3 EFFECTS OF THE ACTION

This section considers and discusses all effects on the listed species that are caused by the proposed action and are reasonably certain to occur, including the effects of other activities that would not occur but for the proposed action.

2.11.3.1 INDIRECT INTERACTIONS

As part of your project description, you identified that there are no anticipated environmental stressors resulting from your proposed project. Because there are no stressors occurring, no resource needs will be exposed to or affected by changes in the environment. Therefore, no indirect interactions will occur that would result in effects to the Roseate Tern.

2.11.3.2 DIRECT INTERACTIONS

No direct interactions leading to effects on species are expected to occur from the proposed project.

2.11.4 CUMULATIVE EFFECTS

Reasonably foreseeable planned actions, which are discussed below, include eight types of actions: (1) other wind energy development activities, such as site characterization surveys; site assessment activities; and construction, operation, and decommissioning of wind energy facilities; (2) hydrokinetic projects; (3) undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); (4) marine minerals use and ocean dredged material disposal; (5) military use; (6) marine transportation; (7) fisheries use and management; and (8) global climate change. These actions would result in increased vessel presence and traffic within the Action Area, which would in turn result in the following stressors to Roseate Tern:

- Associated noise air emissions, lighting, vessel discharges;
- Strikes and spills; and
- Increased aircraft traffic from biological surveys and associated noise, lighting, and air emissions.

However, increase in vessel activity as a result of the reasonably foreseeable actions is not expected to substantially increase the overall level of vessel traffic within the Action Area. As such, when considered in conjunction with the Proposed Action, cumulative effects are not expected to measurably affect Roseate Tern populations within the Action Area.

2.11.5 DISCUSSION AND CONCLUSION

DETERMINATION: NLAA

COMPENSATION MEASURES

N/A

2.12 RUFA RED KNOT

2.12.1 STATUS OF THE SPECIES

This section should provide information on the species' background, its biology and life history that is relevant to the proposed project within the action area that will inform the effects analysis.

2.12.1.1 LEGAL STATUS

The Rufa Red Knot is federally listed as 'Threatened' and additional information regarding its legal status can be found on the ECOS species profile.

2.12.1.2 RECOVERY PLANS

Available recovery plans for the Rufa Red Knot can be found on the ECOS species profile.

2.12.1.3 LIFE HISTORY INFORMATION

Length: 25-28 cm. Adults in spring: Above finely mottled with grays, black and light ochre, running into stripes on crown; throat, breast and sides of head cinnamon-brown; dark gray line through eye; abdomen and undertail coverts white; uppertail coverts white, barred with black. Adults in winter: Pale ashy gray above, from crown to rump, with feathers on back narrowly edged with white; underparts white, the breast lightly streaked and speckled, and the flanks narrowly barred with gray. Adults in autumn: Underparts of some individuals show traces of the "red" of spring.

IDENTIFIED RESOURCE NEEDS

Beaches

Type: barrier island beaches and type: sandy beaches

Coastal shore

Type: flat, sandy and type: sandbar, tidal sand flat, beach, shoal

Horseshoe crabs

Mass: 30,000 horseshoe crab eggs/per day/per red knot

Invertebrates

Type: freshwater, marine, and terrestrial invertebrates

Mollusks

Small islands

Type: marsh islands

Vegetation

2.12.1.4 CONSERVATION NEEDS

The *rufa* red knot is a medium-sized member of the sandpiper family that breeds in the Canadian Arctic and winters along the northwest coast of the Gulf of Mexico, along the Atlantic coast from Florida to North Carolina, and along the Atlantic coasts of Argentina and Chile (USFWS 2014). Over the last 20 years, the *rufa* red knot has declined from a population estimated at 100,000 to 150,000 down to 18,000 to 33,000 (Niles et al. 2008). The primary threat to the *rufa* red knot population is the reduced availability of horseshoe crab (*Limulus polyphemus*) eggs in Delaware Bay arising from elevated harvest of adult crabs (Niles et al. 2008). Horseshoe crab eggs are an important dietary component during migration, and reduced availability at key migratory stopover sites may be a likely cause of recent species declines (Niles et al. 2008; USFWS 2014).

2.12.2 ENVIRONMENTAL BASELINE

*The environmental baseline describes the species' health **within the action area only** at the time of the consultation, and does not include the effects of the action under review. Unlike the species information provided above, the environmental baseline is at the scale of the Action area.*

2.12.2.1 SPECIES PRESENCE AND USE

A telemetry study by Loring et al. (2018) found that red knots that migrated during early fall departed from the Atlantic coast in a southeast direction, likely heading to long-distance wintering destinations in South America. In addition, *rufa* red knots that migrated during late fall traveled southwest across the Mid-Atlantic Bight, likely heading to short distance wintering destinations in the southeastern United States and Caribbean. Interestingly, *rufa* red knots migrated through federal waters of the Atlantic Outer Continental Shelf during evenings with fair weather and a tailwind blowing in their direction of travel. Tagged individuals exhibited a temporal difference in fall migration between hatch year birds (late fall) and adults (early fall) and short distance migrants are more likely to migrate during late fall than long distance migrants. A telemetry study by Loring et al. (2020) found that in spring, red knots had the highest probability of presence in the Atlantic OCS from mid-May to early June when wind speeds were moderate (~10 meters/second) blowing to the north–northeast. In the fall, red knots had the highest probability of presence in the Atlantic OCS at the beginning of July, which decreased through October, followed by a slight increase in November. A correlation of higher probability of presence in the Atlantic OCS during the fall was associated with wind direction, which blew to the south-southeast and a high atmospheric pressure. During both the spring and fall, precipitation was low (<3 kilograms/meters2) during flights in the Atlantic OCS. Duijns et al. (2019) recently examined migration speeds, airspeed, and timing of departure and found that *rufa* red knots migrated quicker during the pre-breeding season, compared to the post-breeding season. During the spring migration period, *rufa* red knots migrate quicker to breeding grounds from wintering areas, but they fly at faster speeds during the fall migration. Results also displayed that post-breeding season, *rufa* red knots exhibit flexible departure direction to capture tailwinds, higher airspeed, and longer stopover durations. However, the automated telemetry array did not fully cover the length of the Flyway and bird behavior outside of the study area was not captured during this study. Loring et al. (2018) reported that tagged red knots were detected crossing DE OCS-A 0482, MD OCS-A 0489 and 0490, and Virginia (VA OCS-A 0483 and 0497) during or after staging movements. These lease areas are shoreward of the WEAs considered in this BA. The modeled movements using VHF tracking acknowledges uncertainties in spatial accuracy, noting that “…the spatial error in locations estimated by the model suggest that caution is advised in interpreting exact movements.”

2.12.2.2 SPECIES CONSERVATION NEEDS WITHIN THE ACTION AREA

The primary threat to the *rufa* red knot population is the reduced availability of horseshoe crab (*Limulus polyphemus*) eggs in Delaware Bay arising from elevated harvest of adult crabs (Niles et al. 2008). Horseshoe crab eggs are an important dietary component during migration, and reduced availability at key migratory stopover sites may be a likely cause of recent species declines (Niles et al. 2008; USFWS 2014).

2.12.2.3 HABITAT CONDITION (GENERAL)

Rufa red knot migration northward through the contiguous United States occurs in April to June and southward migration occurs in July to October. During the spring and fall migration, the red knot is known to migrate over the Atlantic OCS and use stopover sites along the Atlantic coast to refuel and rest (Burger et al. 2012a. Loring et al. 2018). This species occurrence on the Atlantic coast is strictly seasonal. Northerly migrants are known to congregate in shoreline foraging areas in the mid-Atlantic region during the spring, while concentrations of southern migrants congregate in the north-Atlantic region during the fall (Niles et al. 2010; Normandeau 2011; Burger et al. 2012a, 2012b). Coastal areas in Massachusetts are known migratory staging areas during southern migration (USFWS 2021a) and approximately 2,000 to 5,000 individual red knots may stage on Cape Cod during southbound migration (L. Niles, personal communication, July 1, 2020). Few knots are known to occur in Massachusetts from May to June during the spring migration; however, many individuals continue to stop over from July to September (NHESP 2020). Historical migratory stopover locations in Massachusetts included outer Cape Cod beaches and mainland beaches along West Cape Cod (NHESP 2020).

Delaware Bay, along the southern border of Cape May County, is a critical stopover area for *rufa* red knots and supports 50 to 80 percent of all *rufa* red knots during spring migration (USFWS 2014). This stopover site allows the *rufa* red knot to refuel and prepare for a nonstop flight to the Arctic (USFWS 2010a). They use sandy coastal beaches at or near tidal inlets or the mouths of bays and estuaries, peat banks, salt marshes, brackish lagoons, tidal mudflats, mangroves, and sandy/gravelly beaches where they feed on clams, crustaceans, invertebrates, and the eggs of horseshoe crabs that come ashore to spawn in late May. Spring migration coincides with the spawning season for the horseshoe crab, which is an important food for migrating birds, particularly in Delaware Bay. Mussel beds on the New Jersey coast are also an important food source (USFWS 2021b). After stopping in Delaware Bay, some *rufa* red knots traveled up the coast, but the vast majority directly overland to breeding areas in Hudson Bay, Canada, and do not fly farther east over federal waters on the OCS (Loring et al. 2020; Figure 24).

2.12.2.4 INFLUENCES

The primary threat to the *rufa* red knot population is the reduced availability of horseshoe crab (*Limulus polyphemus*) eggs in Delaware Bay arising from elevated harvest of adult crabs (Niles et al. 2008). Horseshoe crab eggs are an important dietary component during migration, and reduced availability at key migratory stopover sites may be a likely cause of recent species declines (Niles et al. 2008; USFWS 2014).

2.12.2.5 ADDITIONAL BASELINE INFORMATION

The *rufa* red knot is one of 72 species (out of 177 species on the Atlantic OCS) that ranked moderate in its relative vulnerability to collision with wind turbines (Robinson Willmott et al. 2013). Despite the presence of many onshore turbines along the red knot's overland migration route (Diffendorfer et al. 2017), there are no records of knots colliding with turbines (78 *Federal Register* 60024).

Recent studies of *rufa* red knot migratory patterns have shown great variation in routes, but with more Mid-Atlantic to southerly concentrations during spring migration and more northerly concentrations during fall migration (Burger et al. 2012a and 2012b; Niles et al. 2010; Normandeau 2011).

2.12.3 EFFECTS OF THE ACTION

This section considers and discusses all effects on the listed species that are caused by the proposed action and are reasonably certain to occur, including the effects of other activities that would not occur but for the proposed action.

2.12.3.1 INDIRECT INTERACTIONS

As part of your project description, you identified that there are no anticipated environmental stressors resulting from your proposed project. Because there are no stressors occurring, no resource needs will be exposed to or affected by changes in the environment. Therefore, no indirect interactions will occur that would result in effects to the Rufa Red Knot.

2.12.3.2 DIRECT INTERACTIONS

No direct interactions leading to effects on species are expected to occur from the proposed project.

2.12.4 CUMULATIVE EFFECTS

Reasonably foreseeable planned actions, which are discussed below, include eight types of actions: (1) other wind energy development activities, such as site characterization surveys; site assessment activities; and construction, operation, and decommissioning of wind energy facilities; (2) hydrokinetic projects; (3) undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); (4) marine minerals use and ocean dredged material disposal; (5) military use; (6) marine transportation; (7) fisheries use and management; and (8) global climate change. These actions would result in increased vessel presence and traffic within the Action Area, which would in turn result in the following stressors to Roseate Tern:

- Associated noise air emissions, lighting, vessel discharges;
- Strikes and spills; and
- Increased aircraft traffic from biological surveys and associated noise, lighting, and air emissions.

However, increase in vessel activity as a result of the reasonably foreseeable actions is not expected to substantially increase the overall level of vessel traffic within the Action Area. As such, when considered in conjunction with the Proposed Action, cumulative effects are not expected to measurably affect *rufa* Red Knot populations within the Action Area.

2.12.5 DISCUSSION AND CONCLUSION

DETERMINATION: NLAA

COMPENSATION MEASURES

N/A

2.13 SEABEACH AMARANTH

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

No components of the Proposed Action occur onshore. Therefore, no effects to Seabeach Amaranth or their habitat are expected to occur as a result of the Proposed Action.

2.14 TRICOLORED BAT

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

The tricolored bat is not expected to be found offshore or on the OCS (Pelletier et al. 2013; ESS Group, Inc. 2014; Hatch et al. 2013; Sjollema et al. 2014; Smith and McWilliams 2016; Dowling et al. 2017). An acoustic survey of bat activity on islands and offshore sites in the Gulf of Maine, mid-Atlantic coast, and Great Lakes regions from 2012 to 2014 found tricolored bats to be the least encountered bat species (Stantec 2016). During the offshore construction of the Block Island Wind Farm, bats were monitored with acoustic detectors on boats; no tricolored bats were detected among the 1,546 bat passes. Preliminary results of the first year of post-construction monitoring at Block Island Wind Farm indicated low number of tricolored bat calls (33 out of 1,086 calls) (Stantec 2018). Tricolored bats have been observed in areas along the coast, and occupying islands some distance from the mainland. These bats are not latitudinal migrators, therefore flights would be limited to nearshore waters, and restricted to migrations to and from hibernacula. Tricolored bats are not anticipated to be encountered in the Research Lease Area.

3 CRITICAL HABITAT EFFECTS ANALYSIS

No critical habitats intersect with the project action area.

4 SUMMARY DISCUSSION AND CONCLUSION

4.1 SUMMARY DISCUSSION

Bats: The species' exposure to vessels during site characterization and assessment activities is expected to be insignificant if exposure were to occur at all. Therefore, because few, if any, northern long-eared bats and tricolored bats are expected to be in the offshore Action Area and because bats are agile flyers, collisions are considered unlikely to occur (*discountable*) and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*). Anthropogenic noise associated with vessels and aircraft during site characterization and assessment activities has the potential to result in impacts on bats in the Action Area. BOEM anticipates impacts from noise would be temporary and highly localized, and that the low potential presence of northern long-eared bat and tricolored bat in the offshore Action Area would result in minimal, if any, exposure to these potential impacts. Therefore, because few, if any, northern long-eared bats or tricolored bats are expected to occur in the offshore Action Area, BMPs and appropriate mitigation measures would be implemented. Under these measures, potential effects from noise are extremely unlikely to occur (*discountable*) and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*).

Birds: The occurrence of roseate tern, rufa red knot, and piping plover in the offshore portions of the Action Area is expected but in very small numbers; therefore, exposure to the IPFs in the offshore environment would be minimal. Furthermore, any noise, accidental releases, and traffic (aircraft), would be temporary and localized. Therefore, for the piping plover, roseate tern, and *rufa* red knot, potential effects from the IPFs are extremely unlikely to occur (*discountable*) and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*). For these reasons, BOEM anticipates that the Proposed Action is not likely to adversely affect the piping plover, the *rufa* red knot, or the roseate tern.

4.2 CONCLUSION

Bats (Northern Long-Eared Bat and Tricolored Bat): Few, if any, northern long-eared bats or tricolored bats are expected in the Action Areas, and the potential effects related to noise are extremely unlikely to occur (discountable) and the size of any impact, were it to occur, would be too small to be measured or evaluated (insignificant). For these reasons, BOEM anticipates that the Proposed Action of lease issuance and site assessment activities will have no effect on the northern long-eared bat or the tricolored bat.

Birds (Piping Plover, Rufa Red Knot, and Roseate Tern):

The occurrence of piping plover, rufa red knot, and roseate tern in the offshore portions of the Action Area is expected but in relatively small numbers and primarily during spring and fall migration through the area; therefore, exposure to the IPFs in the offshore environment would be minimal. Furthermore, any noise, accidental releases, and traffic (aircraft), would be temporary and localized. Therefore, for the piping plover, and rufa red knot, potential effects from the IPFs are extremely unlikely to occur (discountable) and the size of any impact, were it to occur, would be too small to be measured or evaluated (insignificant). For these reasons, BOEM anticipates that the Proposed Action of lease issuance and site assessment activities is not likely to adversely affect the piping plover, the rufa red knot, or the roseate tern.