Mayflower Wind Project
Biological Assessment

For the United States Fish and Wildlife Service

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US Department of the Interior
Bureau of Ocean Energy Management
Office of Renewable Energy Programs

BOEM
Bureau of Ocean Energy Management

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ABBREVIATIONS AND ACRONYMS

Abbreviation	Definition
AC	alternating current
ADLS	Aircraft Detection Lighting System
AIS	Air-Insulated Substation
APM	Applicant-Proposed Measure
ATLW-4	Atlantic Wind Lease Sale-4
BA	Biological Assessment
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Saftey and Environmental Enforcement
CFR	Code of Federal Regulations
CVOW	Coastal Virginia Offshore Wind
COP	Construction and Operations Plan
DC	direct current
DEIS	Draft Environmental Impact Statement
DOI	Department of the Interior
EA	Environmental Assessment
ECC	export cable corridor
EFH	Essential Fish Habitat
EH	Estimated Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FSN	Final Sale Notice
FONSI	Finding of No Significant Impact
Framework	Avian and Bat Monitoring Framework
FW	federal waters
G&G	Geophysical and Geotechnical
GAP	Gap Analysis Project
GBS	Gravity-based structure
GIS	Gas-Insulated Substation
GPS	Global Positioning System
HAPC	Habitat Area of Particular Concern
HD	High Definition
HDD	horizontal directional drilling
HVAC	High voltage alternating current
HVDC	High voltage direct current
IPaC	Information for Planning and Consultation
IPF	impact-producing factor
kV	kilovolt
Lease Area	Lease Area OCS-A 0521
MA DFW	Massachusetts Division of Fish and Wildlife
MCEC	Massachusetts Clean Energy Center
MDAT	Marine-life Data and Analysis Team
MLLW	Mean Lower Low Water

Abbreviation	Definition
MSL	Mean Sea Level
MW	megawatt
NEPA	National Environmental Policy Act
NHP	Natural Heritage Program
NHESP	National Heritage and Endangered Species Program
O&M	operations and maintenance
OCS	Outer Continental Shelf
OECC	Offshore Export Cable Corridor
OSP	Offshore Substation Platform
OSRP	Oil Spill Response Plan
PDE	Project Design Envelope
PH	Priority Habitat
POI	point of interconnection
PPP	Piping Plover Protection Plan
Projects	Mayflower Wind Projects
PSN	Proposed Sale Notice
RFI	Request for Interest
RIDEM	Rhode Island Department of Environmental Management
ROV	Remotely operated vessel
ROW	right-of-way
rpm	revolutions per minute
RSZ	rotor-swept zone
TSS	Total Suspended Solids
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VHF	very high frequency
WDA	Wind Development Area
WEA	Wind Energy Area
WNS	white-nose syndrome
WTG	wind turbine generator

1. Introduction

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Bureau of Ocean Energy Management (BOEM) requests informal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding species that may be affected by the approval of a Construction and Operations Plan (COP) for the Mayflower Wind Project (Project).[1] BOEM's mission is to continue to regulate offshore renewable energy development activities in an environmentally responsible way. The Energy Policy Act of 2005 authorized the development of regulations for the Outer Continental Shelf (OCS) Renewable Energy Program. This regulatory framework requires BOEM to coordinate with USFWS to conduct reviews under the ESA. Co-action agencies including the U.S. Army Corps of Engineers (USACE) and Bureau of Safety and Environmental Enforcement (BSEE), will additionally review this Biological Assessment (BA) to meet each agency's consultation requirements under the ESA.

As detailed in the Mayflower Wind Project Construction and Operations Plan (COP) (Mayflower Wind 2022), the proposed Project would include the construction, operations and maintenance (O&M), and eventual decommissioning of a 2,400-megawatt (MW) wind energy facility within the range of design parameters described in Volume 1 of the Mayflower Wind COP (Mayflower Wind 2022) and summarized in Appendix C, *Project Design Envelope and Maximum-Case Scenario*, of the Environmental Impact Statement (EIS). The Project would consist of up to 149 structure positions to be occupied by up to 147 wind turbine generators (WTGs) and up to five offshore substation platforms (OSPs) connected by interarray cables within the Lease Area, and two offshore export cable corridors (ECCs) with landfalls at Falmouth and Brayton Point, Massachusetts and an intermediate landfall on Aquidneck Island, Rhode Island, along the corridor to Brayton Point. Onshore facilities would include landfall locations, onshore export cables, one substation, one converter station, underground transmission lines, and the utilities' points-of-interconnection (POI). The Mayflower Wind offshore wind energy facility is within BOEM Renewable Energy Lease Area OCS-A 0521 (Lease Area) of the Massachusetts Wind Energy Area (WEA) on the Outer Continental Shelf (OCS), approximately 30 miles (48 kilometers) south of Martha's Vineyard and 20 miles (32 kilometers) south of Nantucket (Figure 1).

This BA evaluates the potential effects of the proposed Project on federally listed species under the jurisdiction of USFWS that would occur or potentially occur within the Project area if BOEM were to approve the COP. Federally listed species under the jurisdiction of the National Marine Fisheries Service are being evaluated in a separate BA. This BA describes the proposed Project (Section 2), defines the Action Area (Section 3), describes the federally listed species potentially affected by the proposed Project (Section 4), analyzes how the proposed Project may affect listed species or their habitats (Section 1), and provides BOEM's ESA Section 7 effects determinations (Section 6).

[1] On February 1, 2023, Mayflower Wind Energy LLC changed its name to SouthCoast Wind Energy LLC and changed the project name from the Mayflower Wind Project to the SouthCoast Wind Project. Because the name change occurred after this Biological Assessment was initially drafted, this document still refers to Mayflower Wind.

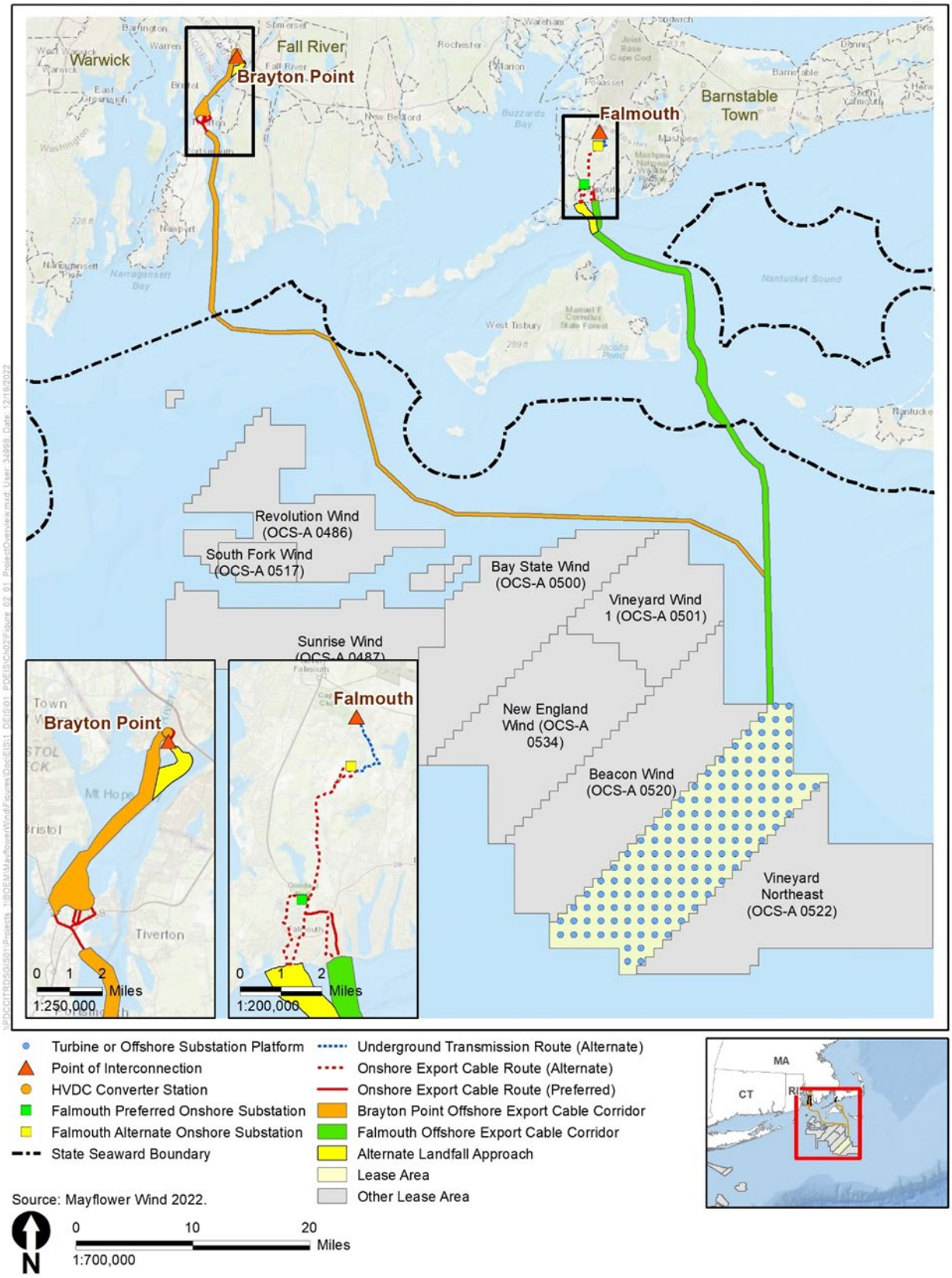


Figure 1. Mayflower Wind Project area

1.1 Background

In 2009, the Department of the Interior announced final regulations for the OCS Renewable Energy Program, which was authorized by the Energy Policy Act of 2005. The act, implemented by BOEM, provides a framework for issuing leases, easements, and rights-of-way (ROWs) for OCS activities. BOEM's renewable energy program occurs in four distinct phases: (1) planning and analysis, (2) lease issuance, (3) site assessment, and (4) construction and operations. The location of the Massachusetts WEA was identified by BOEM through a multi-year effort by state and federal regulatory agencies to identify OCS areas suitable for offshore renewable energy development in the Mid-Atlantic. The original Area of Interest considered by BOEM for leasing was reduced in size and aliquots were removed to address potential environmental constraints, user group conflicts, navigational safety, public health and safety, and stakeholder concerns (e.g., commercial fishing).

The history of BOEM's planning and leasing activities for the Lease Area includes the following:

- On December 29, 2010, BOEM published a Request for Interest (RFI) in the *Federal Register* to gauge commercial interest in wind energy development offshore Massachusetts. BOEM also invited the public to comment and provide information on environmental issues and data that should be considered in the development of the Wind Planning Areas for wind energy development offshore Massachusetts. The public comment period closed on April 18, 2011, and BOEM received 11 indications of interest from 10 companies wishing to obtain a commercial lease for a wind energy project and received approximately 260 public comments. After consideration of public comments and input from BOEM's intergovernmental Massachusetts Renewable Energy Task Force, BOEM modified the Wind Planning Area offshore Massachusetts.
- On February 6, 2012, BOEM published a Call for Information and Nominations (Call) for commercial leasing for wind power on the OCS offshore Massachusetts in the *Federal Register*. The public comment period for the Call closed on March 22, 2012. In response, BOEM received 32 comments and ten nominations of interest. After considering comments, BOEM excluded an area of high sea duck concentration, as well as an area of high-value fisheries to reduce conflict with commercial and recreational fishing activities.
- On June 18, 2014, BOEM published in the *Federal Register* a Notice of Availability of a Revised Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for commercial wind lease issuance and site assessment activities on the Atlantic OCS offshore Massachusetts.
- On June 18, 2014, BOEM published a Proposed Sale Notice (PSN) for Commercial Leasing for Wind Power on the Outer OCS Offshore Massachusetts in the *Federal Register* for Leases OCS-A 0500, OCS-A 0501, OCS-A 0502, and OCS-A 0503.
- On November 26, 2014, BOEM published a Final Sale Notice (FSN) for Commercial Leasing for Wind Power on the OCS Offshore Massachusetts in the *Federal Register* for Atlantic Wind Lease Sale-4 (ATLW-4) that covered the same four lease areas covered by the 2014 PSN. The sale for ATLW-4 was held on January 29, 2015. Lease areas OCS-A 0502 and OCS-A 0503 went unsold during the lease sale.
- On April 11, 2018, BOEM published a PSN requesting public comments on the proposal to auction Leases OCS-A 0502 and OCS-A 0503 offshore Massachusetts for commercial wind energy development, the same lease areas unsold during the ATLW-4 lease sale.
- On October 19, 2018, BOEM published an FSN in the *Federal Register*, which stated a commercial lease sale would be held December 13, 2018, for the Wind Energy Area offshore Massachusetts. BOEM offered three leases, including OCS-A 0521, which are located within the former Leases

OCS-A 0502 and OCS-A 0503 that were unsold during the ATLW-4 sale on January 29, 2015. Mayflower Wind was the winner of Lease OCS-A 0521.

- On April 1, 2019, BOEM and Mayflower Wind executed the lease agreement for Lease OCS-A 0521.
- On July 29, 2019, Mayflower Wind submitted a Site Assessment Plan for commercial wind Lease OCS-A 0521, which was subsequently revised with a complete Site Assessment Plan submitted on December 12, 2019. BOEM approved the Site Assessment Plan on May 26, 2020.
- On February 15, 2021, Mayflower Wind submitted its COP for the construction, operations, and conceptual decommissioning of the Project within the Lease Area. Mayflower Wind submitted two updated versions of the COP in 2021, one on August 30 and another on October 28.
- On November 1, 2021, BOEM published a Notice of Intent to Prepare an EIS for Mayflower Wind's Proposed Wind Energy Facility Offshore Massachusetts.
- On March 17, 2022, Mayflower Wind submitted a third updated version of the COP.
- On December 22, 2022, Mayflower Wind submitted a fourth updated version of the COP.

1.2 Consultation History

This informal consultation for Proposed Action builds upon BOEM's experience with similar offshore wind assessment and development projects in the Atlantic.

- BOEM was involved in consultation with USFWS regarding the construction, O&M, and decommissioning of offshore WTGs for the Cape Wind Energy Project in federal waters of Nantucket Sound, Massachusetts. USFWS biological opinion (dated November 21, 2008) concluded that the proposed Cape Wind Energy Project was not likely to jeopardize the continued existence of the threatened piping plover (*Charadrius melodus*) and endangered roseate tern (*Sterna dougallii dougallii*) and that, in all cases except collisions, the effects were insignificant or discountable and would not result in take (mortality) of roseate terns and piping plovers (USFWS 2008).
- On March 24, 2011, BOEM requested informal ESA Section 7 consultation with USFWS for lease issuance and site assessment activities off New Jersey, Delaware, Maryland, and Virginia. On June 20, 2011, USFWS concurred with BOEM's determinations that the risk to the endangered roseate tern, threatened piping plover, endangered Bermuda petrel (*Pterodroma cahow*), and candidate *rufa* red knot (*Calidris canutus rufa*) regarding lease issuance, associated site characterization (survey work), and site assessment activities (construction, O&M, and decommission of buoys and meteorological towers) was "small and insignificant" and therefore "not likely to adversely affect" the three federally listed species and one candidate species.
- On October 19, 2012, BOEM requested informal ESA Section 7 consultation with USFWS for lease issuance and site assessment activities off Rhode Island and Massachusetts. On November 1, 2012, USFWS concurred with BOEM's determination that the proposed action was "not likely to adversely affect" the endangered roseate tern, threatened piping plover, and candidate *rufa* red knot. To evaluate collision risk, USFWS recommended the placement of visibility sensors on the meteorological towers to collect data on the occurrence, frequency, and duration of poor visibility conditions.
- BOEM was a cooperating agency with USACE, which informally consulted with USFWS on the Deepwater Wind Block Island Wind Facility and Block Island Transmission System. The Block Island Wind Facility is composed of five 6-MW WTGs within 3 miles (2.6 nautical miles, 4.8 kilometers) of Block Island, Rhode Island. On July 31, 2013, USFWS concurred that the proposed Block Island Wind Facility and Block Island Transmission System were "not likely to adversely affect" the American burying beetle (*Nicrophorus americanus*), roseate tern, piping plover, or *rufa*

red knot "due to insignificant (should never reach the scale where take occurs) and discountable (extremely unlikely to occur) effects."

- On February 12, 2014, BOEM requested informal ESA Section 7 consultation with USFWS for lease issuance and site assessment activities offshore North Carolina, South Carolina, and Georgia. On March 17, 2014, USFWS concurred with BOEM's determination that commercial wind lease issuance and site assessment activities would "not likely adversely affect" the Bermuda petrel, Kirtland's warbler (*Setophaga kirtlandii*), roseate tern, piping plover, and *rufa* red knot.
- BOEM was the lead agency and informally consulted with USFWS on the Virginia Offshore Wind Technology Advancement Project. The project is composed of two 6-MW WTGs 27.6 miles (24 nautical miles, 44.4 kilometers) offshore with a subsea export cable making landfall on Camp Pendleton Beach. On January 29, 2015, USFWS acknowledged the determinations of "no effect" on hawksbill sea turtles (*Eretmochelys imbricata*) and leatherback sea turtles (*Dermochelys coriacea*) and "not likely to adversely affect" the green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempii*), loggerhead sea turtle (*Caretta caretta*), piping plover, *rufa* red knot, roseate tern, Bermuda petrel, and black-capped petrel (*Pterodroma hasitata*). On March 27, 2019, USFWS completed its review of the revised plan and found that no effects on federally listed species or designated critical habitat would occur.
- On September 3, 2020, BOEM requested informal consultation from USFWS regarding the approval of the Vineyard Wind Offshore Energy Project COP for the construction, O&M, and decommissioning of a commercial-scale offshore wind energy facility within a BOEM Renewable Energy Least Area (OCS-A 0501) 14 miles (23 kilometers) southeast of Martha's Vineyard, Massachusetts. On October 16, 2020, USFWS concurred with BOEM's determination that the project would "not likely adversely affect" the roseate tern, piping plover, and *rufa* red knot.
- On January 28, 2021, BOEM requested informal consultation from USFWS regarding the approval of the South Fork Offshore Wind COP for the construction, O&M, and decommissioning of a commercial-scale offshore wind energy facility within a BOEM Renewable Energy Lease Area (OCS-A 0486) 19 miles southeast of Block Island, Rhode Island and 35 miles (56 kilometers)east of Montauk Point, New York. On March 14, 2021, USFWS concurred with BOEM's determination that the project would "not likely adversely affect" the roseate tern, piping plover, *rufa* red knot, seabeach amaranth (*Amaranthus pumilus*), and northern long-eared bat (*Myotis septentrionalis*).
- 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.
- On May 27, 2022, BOEM requested informal consultation from USFWS regarding the approval of the Ocean Wind COP for the construction, O&M, and decommissioning of a commercial-scale offshore wind energy facility within a BOEM Renewable Energy Lease Area (OCS-A 0498). BOEM has determined that the Proposed Action would have "no effect" to the bog turtle or American chaffseed. BOEM has also determined that the Proposed Action "may affect, but is not likely to adversely affect" the northern long-eared bat; piping plover; *rufa* red knot; roseate tern; eastern black rail; saltmarsh sparrow; monarch butterfly; Knieskern's beaked-rush; seabeach amaranth; sensitive joint-vetch; and swamp pink.
- On July 28, 2022, in preparation for this BA, BOEM used USFWS's Information for Planning and Consultation (IPaC) system to determine that six federally listed, proposed, or candidate species occur or potentially occur in the Action Area (see details in Section 3, and Section 4). Some project components were rerun through IPaC in September 2022 with more precise location information.

2. Description of Proposed Action

Under the Proposed Action (Alternative B in the EIS) the construction, O&M, and eventual decommissioning of the Project on the OCS offshore of Massachusetts would occur within the range of design parameters described in Volume 1 of the Mayflower Wind COP (Mayflower 2022), subject to applicable mitigation measures. The Project would include up to 149 positions occupied by WTGs and OSPs. The 149 positions would conform to a 1-nautical-mile-by-1-nautical-mile (1.9-kilometer-by-1.9-kilometer) grid layout with an east–west and north–south orientation, which was agreed on across all Massachusetts/Rhode Island Wind Energy Area leaseholders (Equinor Wind US, Eversource Energy, Mayflower Wind, Orsted North America, and Vineyard Wind LLC, 2019). The key components of the Project are summarized in Table 1, and a schematic of the Project components is depicted on Table 1. COP Volume 1, Section 3 (Mayflower 2022) provides further details and discussion on the description of the Proposed Action and construction methods and schedule, which this document summarizes below.

Table 1. Mayflower Wind Project Design Envelope summary

Project Component	Location	Project Details & Envelope Characteristic(s)
Layout and Project Size	Offshore	Up to 149 WTG/OSP positions Up to 147 WTGs Up to 5 OSPs 1-nautical-mile-by-1-nautical-mile (1.9-kilometer-by-1.9-kilometer) grid layout with east–west and north–south orientation
Substructures	Offshore	Monopile, piled jacket, suction-bucket jacket, and/or gravity-based structure (up to two different concepts will be installed) Seabed penetration: 0–295.3 feet (0–90.0 meters) Scour protection for up to all positions
WTGs	Offshore	Rotor diameter: 721.7–918.6 feet (220.0–280.0 meters) Blade length of 351.0–452.8 feet (107.0–138.0 meters) Hub height above MLLW: 418.7–605.1 feet (127.6–184.4 meters)
OSPs	Offshore	Maximum structures envisaged located on grid positions: 5 Top of topside height above MLLW: 160.8–344.5 feet (49.0–105.0 meters) Scour protection for all positions Up to 10 million gallons per day of once-through non-contact cooling water, with a maximum intake velocity of 0.5 feet per second, with a maximum anticipated temperature change of 18°F (10°C) from ambient water, and a maximum end-of-pipe discharge temperature of 90°F (32.2°C) Depth of withdrawal for cooling water ranging from approximately 25 to 115 feet (7.6 to 35.0 meters) below the surface
Inter-Array Cables	Offshore	Nominal interarray cable voltage: 60 kV to 72.5 kV Length of interarray cables beneath seafloor:124.2–497.1 miles (200–800 kilometers) Target burial depth (below level seabed): 3.2–8.2 feet (1.0–2.5 meters)

Project Component	Location	Project Details & Envelope Characteristic(s)
Falmouth Offshore Export Cables	Offshore	Number of offshore export cables: up to 5 Anticipated nominal export cable voltage (AC or DC): 200–345 kV (AC) or ±525 kv (DC) Length per export cable beneath seabed: 51.6–87.0 miles (83.0–140.0 kilometers) Cable/pipeline crossings: up to 9 Target burial depth (below level seabed): 3.2–13.1 feet (1.0–4.0 meters)
Brayton Point Offshore Export Cables	Offshore	Number of offshore export cables: up to 6 Nominal export cable voltage (DC): ±320 kV Length per export cable beneath seabed: 97–124 miles (156–200 kilometers) Cable/pipeline crossings: up to 16 Target burial depth (below level seabed): 3.2–13.1 feet (1.0–4.0 meters)
Aquidneck Island Onshore Export Cable Route (Intermediate landfall)	Onshore	Portsmouth, Rhode Island Nominal underground onshore export cable voltage for DC transmission: ±320 kV Up to 4 onshore export cables and up to 2 communications cables Up to 3 miles (4.8 kilometers) per cable
Falmouth Landfall Site	Onshore	Three locations under consideration: Worcester Avenue, Central Park, and Shore Street Installation methodology: HDD
Brayton Point Landfall Site	Onshore	Brayton Point: Two locations under consideration: Eastern and Western shorelines of Brayton Point Brayton Point: Installation methodology: HDD Aquidneck Island: Several locations under consideration for the intermediate landfall across the island Aquidneck Island: Installation methodology: HDD
Onshore Export Cables from Landfall to Onshore Substation	Onshore	Falmouth, Massachusetts Nominal underground onshore export cable voltage for AC transmission: 200–345 kV Up to 12 onshore export power cables and up to five communications cables Up to 6.4 miles (10.3 kilometers) per cable
Onshore Export Cables from Landfall to HVDC Converter Station	Onshore	Somerset, Massachusetts Nominal underground onshore export cable voltage for DC transmission: ±320 kV Up to 6 onshore export cables and up to 2 communications cables Up to 0.6 miles (1.0 kilometers) per cable
Onshore Substation	Onshore	Falmouth, Massachusetts Two locations under consideration: Lawrence Lynch and Cape Cod Aggregates Up to 26 acres (10.5 hectares) for the substation yard Transform to 345 kV AIS or GIS configurations

Project Component	Location	Project Details & Envelope Characteristic(s)
HVDC Converter Station	Onshore	Somerset, Massachusetts HVDC converter station Up to 7.5 acres (3 hectares) Convert the power from DC to 345 kV AC for injection to the existing ISO-NE grid system
Transmission Line from Onshore Substation to Falmouth POI	Onshore	Falmouth, Massachusetts New 345-kV overhead transmission line along existing utility ROW (preferred) To be designed, permitted, constructed, and operated by transmission system owner, Eversource New, 345-kV underground transmission line (alternate) Up to 2.1 miles (3.4 kilometers) in length
Transmission Line from HVDC Converter Station to Brayton Point POI	Onshore	Somerset, Massachusetts New, 345-kV underground transmission line Up to 0.2 mile (0.3 kilometer) in length
Falmouth POI	Onshore	Falmouth, Massachusetts Upgrades to existing Falmouth Tap (new or upgraded POI by Eversource)
Brayton Point POI	Onshore	Somerset, Massachusetts Existing, National Grid substation 345-kV GIS breaker building at National Grid substation Station

Source: COP Volume 1, Table 3-1; Mayflower 2022.
WTG = OSP = AC = alternating current; AIS = air-insulated substation; DC= direct current; GIS =gas-insulated substation; HDD = horizontal directional drilling; kV = kilovolts; MLLW = mean lower low water

2.1 Construction and Installation

The Proposed Action would include the construction and installation of both onshore and offshore facilities. Mayflower anticipates that construction and installation would start in Quarter 1 of 2024 and completed in Quarter 4 of 2030. Construction initiated onshore components, followed by seabed preparations and concurrent construction of offshore components is anticipated by Mayflower. Table 2 summarizes the Project construction schedule. An indicative project schedule of the timeline for construction activities for onshore and offshore project components is included in COP Volume 1, Chapter 3, Figure 3-6 (Mayflower 2022).

Table 2. Mayflower Wind indicative construction schedule

Construction Activity	Mayflower Wind Indicative Construction Schedule
Scour Protection, Seabed Preparation, and Substructure Installation	Q1 of 2025 to Q3 of 2030
Onshore Export Cables and Onshore Substations	Q1 of 2024 to Q4 of 2030
OSP Installation and Commissioning	Q3 of 2027 to Q3 of 2029
Offshore Export Cable Installation	Q4 of 2024 to Q2 of 2029
Interarray Cable Installation	Q2 of 2026 to Q3 of 2030
WTG Installation and Commissioning	Q2 of 2029 to Q4 of 2030

Source: COP Volume 1, Chapter 3.2, Figure 3-6; Mayflower Wind 2022.
Q = quarter where Q1 = April to June; Q2 = July to September; Q3 = October to December; Q4 = January to March.

2.1.1 Onshore Activities and Facilities

Proposed onshore project elements include the landfall sites, the sea-to-shore transition that connects the offshore export cable to the onshore export cable, onshore export cable routes to the onshore substation and converter station, and the connection from the onshore substation and converter station to the existing grid. Appendix C, *Project Design Envelope and Maximum-Case Scenario*, describes the Project Design Envelope (PDE) for onshore activities and facilities, and the Mayflower COP Volume 1, Section 3.3 provides additional details on construction and installation methods (Mayflower Wind 2022).

Multiple landfall sites for the two offshore export cables are under consideration as part of the PDE, though only one landfall site would be needed for each export cable. Landfall at three potential locations in Falmouth, Massachusetts, and two potential locations at Brayton Point in Somerset, Massachusetts, are under consideration.

Three locations in Falmouth, Massachusetts, are considered feasible landfall locations for the Falmouth offshore ECC (Figure 2).

- **Worcester Avenue:** This landfall site would be located on a previously disturbed, off-road, grassy median strip known as Worcester Park. This location is protected by a short seawall, a broad beach, and Surf Drive.
- **Central Park:** This landfall site would occur at a public recreational park at Central Park on Falmouth Heights Beach north of Grand Avenue. This landfall site is flanked on the southern side by paved parking spaces, which could be used for construction staging.
- **Shore Street:** This landfall site would be located on Surf Drive Beach at the intersection of Surf Drive and Shore Street. This location involves the potential crossing of two existing submarine cables that make landfall at Shore Street.

Two locations at Brayton Point in Somerset, Massachusetts, are considered feasible landfall locations for the Brayton Point offshore ECC (Figure 3). The Brayton Point Landfall Option A approaches the former Brayton Point Power Station from the west near the Lee River. This landfall occurs on previously disturbed property adjacent to the existing cooling towers and includes an open paved area to the south, which would be used for construction staging. The Brayton Point Landfall Option B approaches the former Brayton Point Power Station from the east near the Taunton River. This landfall would occur on the previously disturbed Brayton Point property at a paved parking lot.

The offshore export cable route to Brayton Point would include an intermediate landfall on Aquidneck Island, Rhode Island, where several potential landfall locations are under consideration. The purpose of the intermediate landfall on Aquidneck Island is to avoid a narrow and highly constrained area of the Sakonnet River at the old Stone Bridge and Sakonnet River Bridge. This area is being avoided because surveying, cable installation, burial, and operation is significantly challenging. One location at the intersection of Boyds Lane and Park Avenue is being considered for the entry horizontal directional drilling (HDD) to Aquidneck Island. The export cables would exit Aquidneck Island into Mount Hope Bay following one of three cable route option (Figure 4). HDD will be used to install cables under sensitive coastal and nearshore habitats, such as dunes, beaches, waterways, and submerged aquatic vegetation, or major infrastructure such as railroads and highways. For export cable landfalls, the HDD operations typically start from the onshore landfall location and exit offshore. For landfalls, onshore and offshore work areas are required.

Onshore, using a rig that drills, a horizontal borehole is created under the surface and exits onto the seafloor. The submarine cables are floated out to sea, then pulled back onshore within the drilled borehole. Onshore HDD used to avoid sensitive habitats is similar but requires two onshore work areas on either side of the avoided habitat. Starting at one onshore location, a borehole is created under the surface

and exits to the other onshore location. The ducts and cables are then pulled back within the drilled borehole.

For the exit HDD into Mount Hope Bay, three locations are under consideration: one location northeast of the Mount Hope Bridge (Route Option 1), one location in the parking lot of Roger Williams University Baypoint Residence Hall and Conference Center on Anthony Road or along an existing overhead utility line corridor (Route Option 2), and one location on the northeastern side of the Montaup Country Club golf course (Route Option 3; Figure 4). After exiting Aquidneck Island into Mount Hope Bay, the Brayton Point offshore ECC would then continue to make final landfall at one of the locations under consideration at Brayton Point in Somerset, Massachusetts.

The landfall at Aquidneck Island would require HDDs at two locations: one entering and one exiting the island. For the Falmouth offshore export cable and the Brayton Point offshore ECC, it is anticipated that the cables would be unbundled at landfall. Each individual power cable would require a separate HDD with an individual bore and conduit for each power cable. If a dedicated communications cable is used, it may be installed within the same bore as a power cable but would likely require a separate conduit.

Once the offshore export cables make landfall, depending on the landfall location, the cables would either connect to the new onshore substation or converter station via the onshore cable route corridors shown on Figure 2 and Figure 3. One of the three Falmouth onshore export cable routes and one of the two Brayton Point onshore export cable routes would be used based on the landfall site selected. The Brayton Point onshore export cable would be no longer than 0.6 mile (1.0 kilometers) because of the proximity of the landfall site to the location of the new HVDC converter station. Depending on the landfall site selected and the onshore substation chosen, the Falmouth onshore export cable would be between 1.9 miles (3.0 kilometers) and 6.4 miles (10.3 kilometers).

Mayflower Wind would commission the development of a new onshore substation to transform the underground export cable for interconnection with the Falmouth POI. There are two onshore substation locations under consideration. Onshore Substation Option A (Mayflower Wind's preferred location) at the Lawrence Lynch site would be located west of Gifford Street and north of Jones Road in Falmouth, Massachusetts, on approximately 27.3 acres (11.05 hectares) of previously disturbed land. Onshore Substation Option B would be on the 33.6-acre (13.6-hectare) Cape Cod Aggregate site at the north end of Blacksmith Shop Road in Falmouth, Massachusetts. Mayflower Wind would commission the development of a new HVDC converter station to convert the Projects' HVDC power to 345-kilovolt (kV) high voltage alternating current (HVAC) for interconnection with the Brayton Point POI. The converter station would be located on the northern portion of the former Brayton Point Power Station site, a former coal-fired plant that was decommissioned in 2017. The maximum footprint of the converter station site would be up to 7.5 acres (3 hectares).

At Brayton Point, an underground transmission route would connect the converter station to the POI. If significant underground infrastructure from the decommissioned cooling towers prevents a suitable buried path, an overhead line to the POI may be required. In Falmouth, overhead transmission lines would connect the onshore substation to the POI. An alternate underground transmission route is also under consideration in the event overhead transmission lines are not feasible.

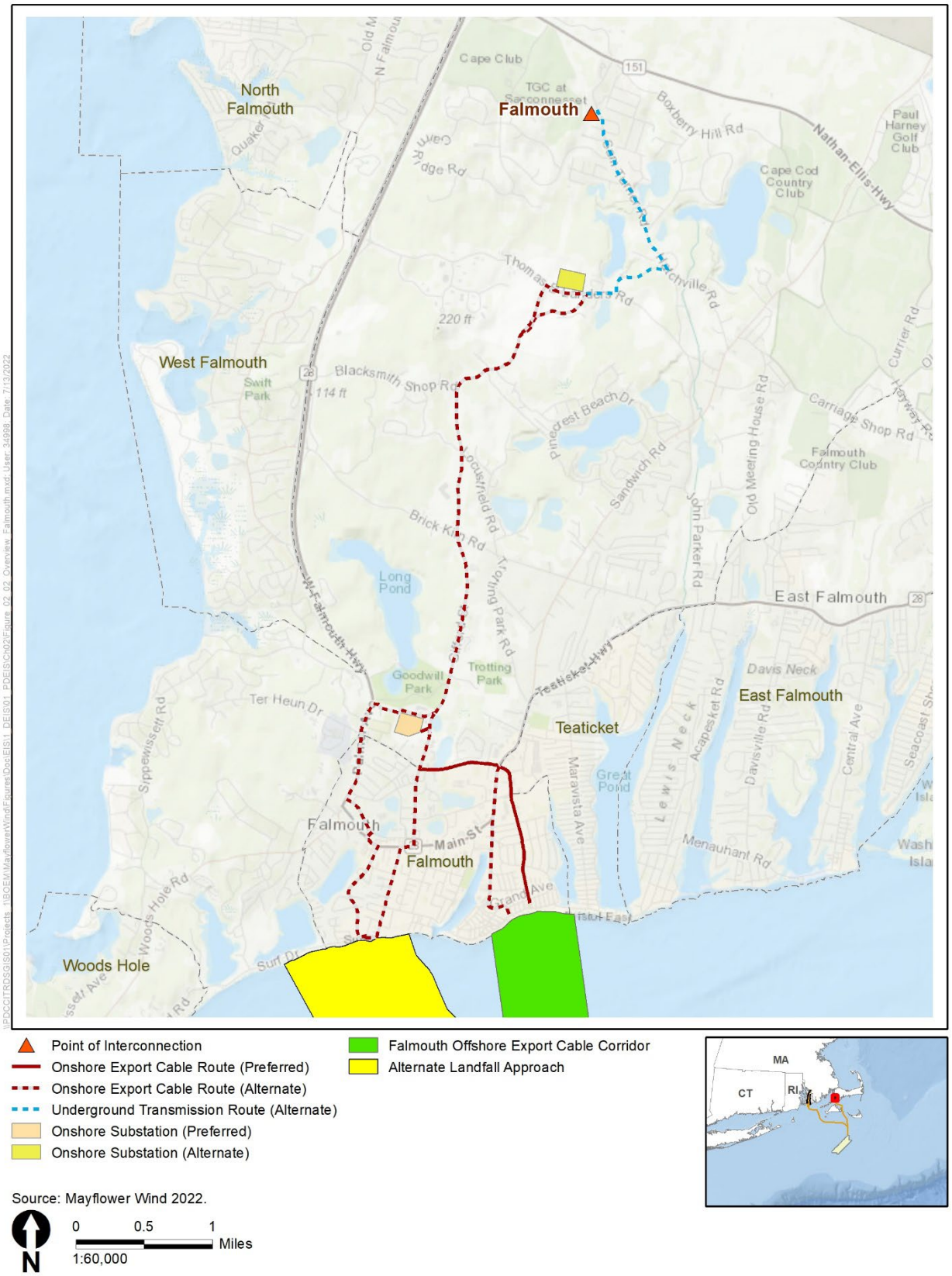


Figure 2. Mayflower Wind onshore facilities – Falmouth

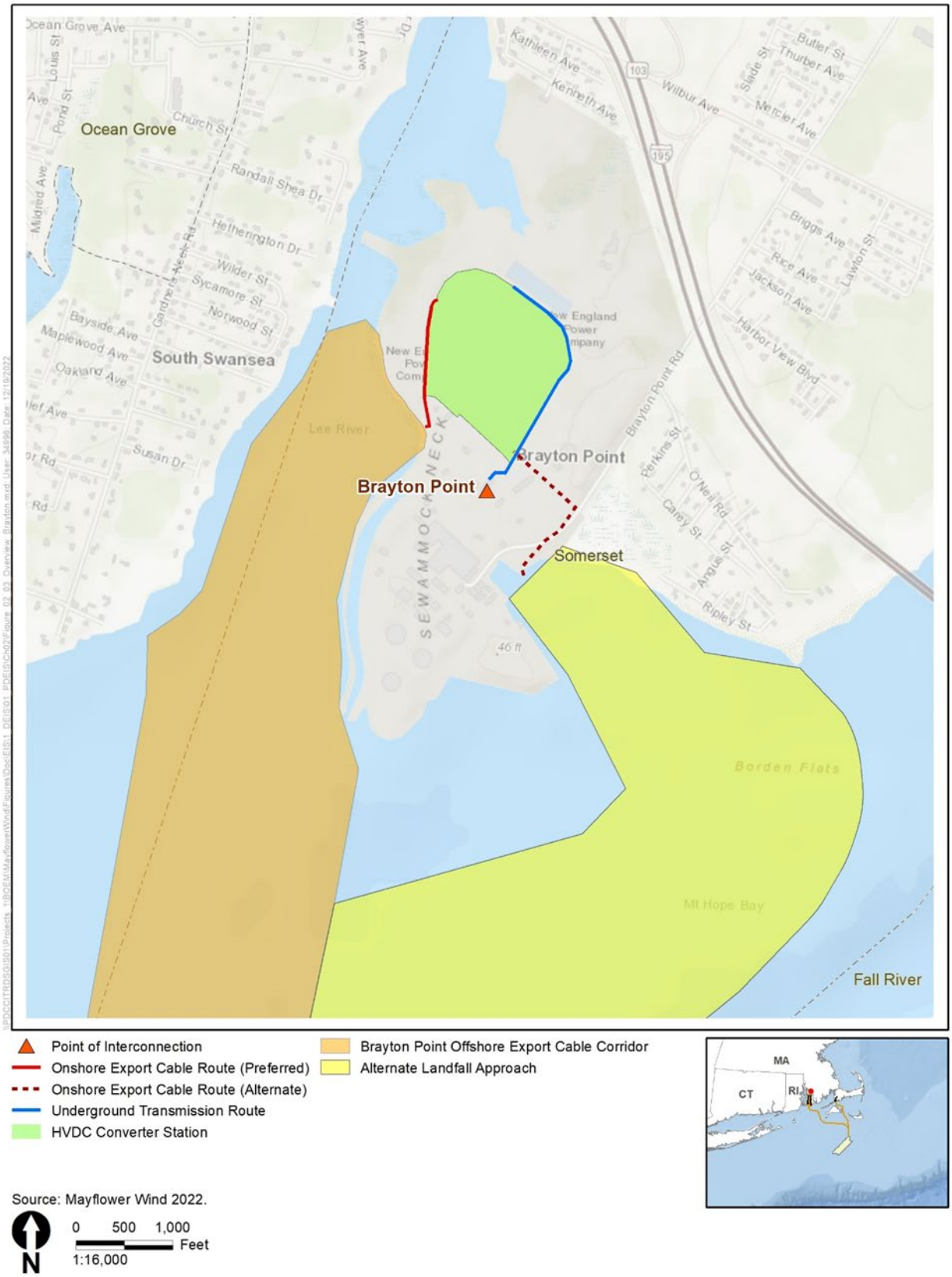


Figure 3. Mayflower Wind onshore facilities – Brayton Point

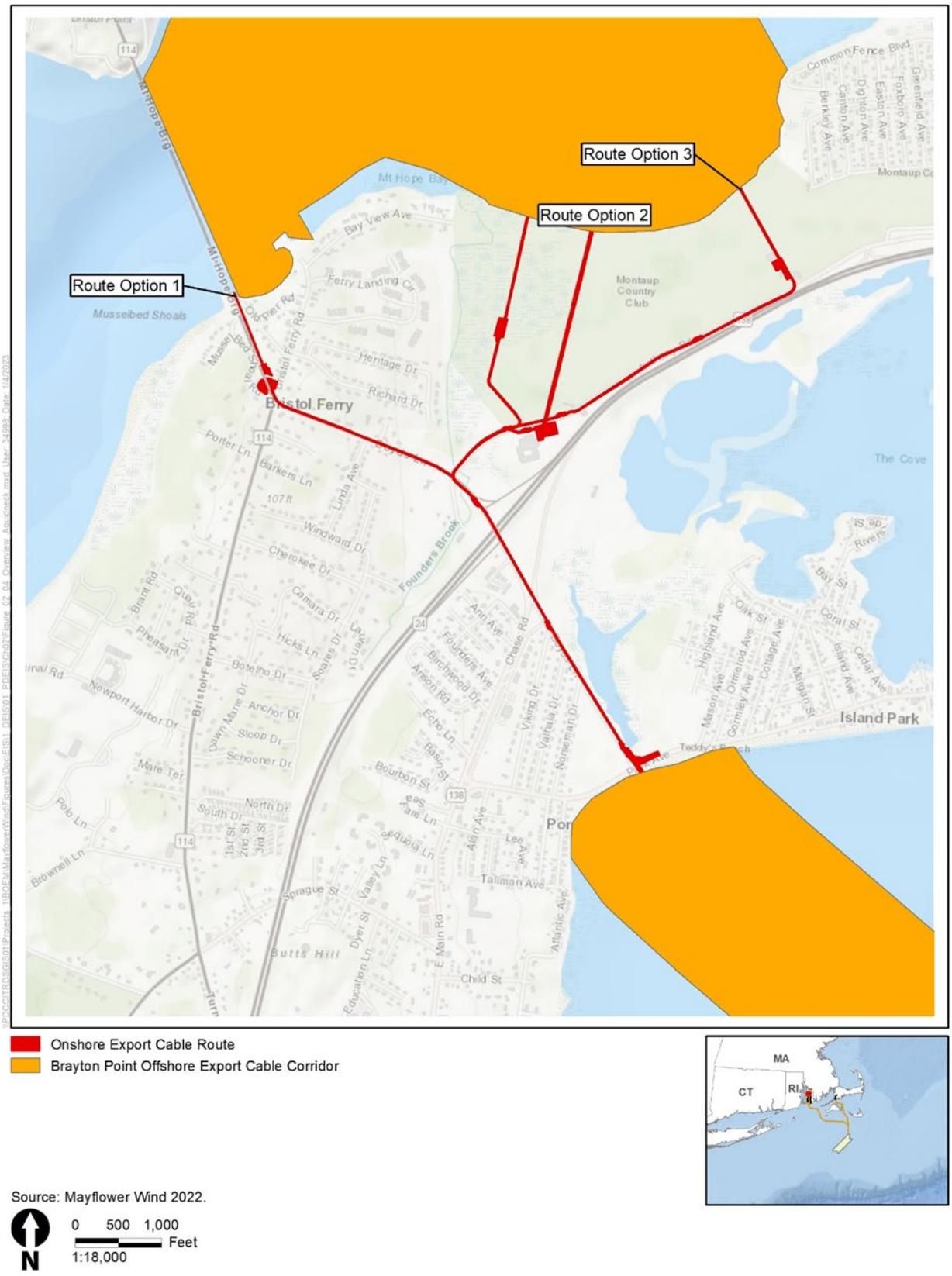


Figure 4. Mayflower Wind onshore facilities – Aquidneck Island

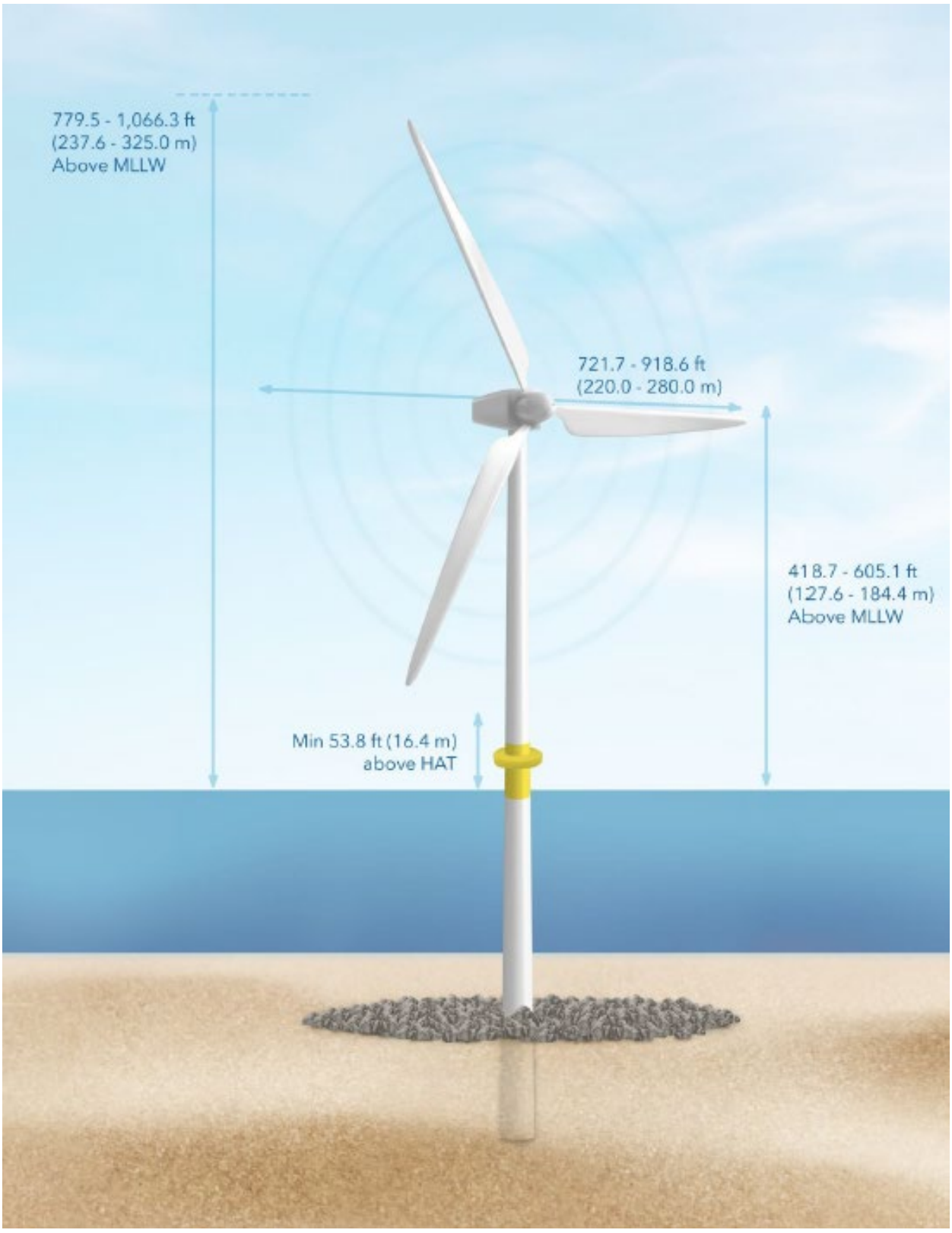
2.1.2 Offshore Activities and Facilities

The proposed offshore project components that collectively compose the Offshore Project area include WTGs, OSPs, substructures, scour protection, interarray cables, and offshore export cables. The proposed offshore Project elements are on the OCS as defined in the Outer Continental Shelf Lands Act, with the exception that offshore export cables within 3 nautical miles of the shore would be in state waters (Figure2). Appendix C, *Project Design Envelope and Maximum-Case Scenario*, describes the PDE for offshore activities and facilities, and the Mayflower COP Volume 1, Section 3.3 provides additional details on construction and installation methods (Mayflower Wind 2022).

Within the 127,388-acre (51,552-hectare) Wind Farm Area, Mayflower Wind would construct up to 149 substructures that support a combination of WTGs and OSPs in a 1-by-1-nautical mile-grid layout with east–west and north–south orientation. Mayflower Wind is considering four types of substructures: monopile, piled jacket, suction-bucket jacket, and gravity-based structure (GBS). Of these four types of substructures considered, up to two would be selected for WTGs and a third type may be selected for OSPs. Monopile foundations typically consist of a single steel cylindrical pile that is embedded into the seabed and is made up of sections of rolled steel plate welded together. A transition piece is fitted over the monopile and secured via bolts or grout. Monopiles can be used to support both the WTGs and the Option A – Modular OSP. Piled jacket structures are large lattice structures fabricated of steel tubes welded together and consist of three- or four-legged structures to support WTGs and four- to nine-legged structures to support OSPs. Suction-bucket jackets have a similar steel lattice design as the piled jacket structures, but these substructures use suction-bucket jackets instead of piles to secure the structure to the seabed. GBS foundations are typically constructed of steel, concrete, or a combination of both. Because these structures have sufficient mass and diameter, they sit on top of the sea floor and are not pile driven. The GBS foundation could be used to support WTGs or the largest OSP platforms, Option C – direct current (DC) converter. Renderings of the substructure types are included in the Mayflower COP Volume 1, Section 3.3.1 (Mayflower Wind 2022).

For all substructure and foundation types, the seabed may be leveled in preparation for installation. Mayflower Wind proposes to install substructures using jack-up, dynamic positioning, or semi-submersible vessels. For monopile and piled-jacket substructures, the foundations would be driven to the target seabed penetration depths using a hydraulic impact hammer, vibratory hammer, water jetting, or combinations of all three. Pile-installation procedures would use a soft-start method with a gradual increase in hammering energy levels warn marine and avian animals, allowing them to distance themselves from the construction activity. During the installation of suction-bucket jacket substructures, the open bottom of the bucket would settle on the seabed, then water and air would be pumped out of the bucket to create a negative pressure, which embeds the foundation bucket into the seabed. Site preparation is a critical element of the overall installation of GBS and may include dredging to remove soft seabed surface layers. GBS substructures would be lowered into position through water ballasting and adding a solid ballast if required. For all substructure types, scour protection, consisting of rock, concrete mattresses, sandbags, artificial seaweed/reefs/frond mats, or self-deploying umbrella systems (typically used for suction-bucket jackets), may be applied around foundations before or after installation, if required.

Up to 147 of the 149 substructure positions in the Wind Farm Area would support the WTGs. The WTGs would extend up to 1,066.3 feet (325.0 meters) at the highest blade tip height with a minimum tip clearance above highest astronomical tide of 53.8 feet (16.4 meters) (Figure 5).



Source: Mayflower Wind 2022

Figure 5. Representative wind turbine generator diagram

The proposed Project would include up to five OSPs to collect the energy generated by the WTGs and would be located on the same 1-by-1-nautical mile grid layout as the WTGs. OSPs help stabilize and maximize the voltage of power generated offshore, reduce potential electrical losses, and transmit energy to shore. Three OSP designs are under consideration: Option A – Modular, Option B – Integrated, Option C – HVDC Converter. Each OPS design would include a topside that houses electrical equipment and a foundation substructure to support the topside. The smallest topside structure would be Option A – Modular and would likely hold a single alternating current (AC) transformer with a single export cable. It would sit on any type of substructure design considered for the WTGs. Option B – Integrated is also an AC solution but is designed to support a high number of interarray cable connections, as well as multiple export cable connections and would contain multiple transformers in a single topside structure. Depending on the weight of the topside structure and soil conditions, the jacket substructure may be four- or six-legged and require one to three piles per leg. Because of its larger size, if Option B is selected, a smaller number of OSPs would be required to support the proposed Project. Option C – HVDC Converter would convert electric power from HVAC to HVDC for transmission to the onshore grid system and would serve as a gathering platform for interarray cables or be connected to one or more HVAC gathering units, which would be similar to the Modular and Integrated OSP designs. The northernmost HVDC Converter OSP would be located outside of a 6.2-foot (10.0-kilometer) buffer from the 98.4-foot (30-meter) isobath from Nantucket Shoals. Due to its size, the HVDC Converter OSP would be installed on either a piled jacket or GBS substructure. Interarray cables would transfer electrical energy generated by the WTGs to the OSPs.

The WTGs and OSPs would be lit and marked in accordance with Federal Aviation Administration (FAA) and US Coast Guard (USCG) lighting standards and consistent with BOEM best practices. Mayflower Wind would implement an Aircraft Detection Lighting System (ADLS) to automatically activate lights when aircraft approach. Lighting would be placed on all structures and would be visible throughout a 360-degree arc from the surface of the water. Tower marking would include unique rows and columns of letters and numbers to maximize charting effectiveness. Reflective paint and lettering materials would be used to provide visibility at night.

Two offshore ECCs are proposed by Mayflower Wind in the COP and presented in Figure 2: the Falmouth ECC and the Brayton Point ECC (Mayflower Wind 2022). The Falmouth ECC would begin from the OSPs in the Lease Area and extend northward through the Muskeget Channel, then turn northwest to the landfall site in Falmouth, Massachusetts. The Brayton Point ECC would start from the OSPs within the Lease Area and extend northwest through the Rhode Island Sound to the Sakonnet River. It would then extend northward until making intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island, for a brief underground onshore export cable route section before entering into Mount Hope Bay and finally to the landfall at Brayton Point. The Falmouth ECC would use either HVAC or HVDC transmission technology and would have transmission export circuits that would consist of up to four power cable circuits and up to one associated communications cable. The Brayton Point ECC would use HVDC transmission technology and would use six single-core power cables with a voltage of up to ±320 kV and up to two associated communications cables. For HVAC transmission, one end of the transmission system would be the OPSs in the Lease Area that would step up the power from the WTG array to a voltage appropriate for long distance transmission. An HVDC system requires converters at each end of the transmission circuit, with one located on the OSPs in the Lease Area and the other converter station located at Brayton Point in Somerset, Massachusetts.

Interarray cables and the export cables would be installed similarly. Prior to installation, the area would be surveyed, and the seafloor would be prepared by removing boulders and buried hazards if applicable. Depending on the survey findings and seabed conditions, several preparation and installation methods and equipment may be used including a vertical injector, a jetting sled, jetting remotely operated vessel

(ROV), pre-cut plow, mechanical plowing, mechanical cutting ROV system and anchoring. More information on cable installation methods can be found in the Mayflower COP Volume 1, Section 3.3.5.4 (Mayflower Wind 2022). Cable protection would be required at any cable crossing locations and for areas where cable burial depth cannot be achieved. Cable protection methods such as the creation of a rock berm, concrete mattress placement, rock placement, and fronded mattresses may be used.

2.2 Operations and Maintenance

The proposed Project is anticipated to have a commercial lifespan of 35 years.[2] The location of the O&M facility has not been finalized; however, Mayflower Wind is considering facilities at one of the Massachusetts-based marshalling ports used during construction and installation. The O&M facility would have trained staff, office space, and a warehouse for spare parts.

The proposed Project would include a comprehensive maintenance program, including preventative maintenance based on statutory requirements, original equipment manufacturers' guidelines, and industry best practices. Mayflower Wind would inspect WTGs, OSPs, foundations, interarray cables, submarine and onshore export cables, and other parts of the proposed Projects using methods appropriate for the location and element. Additionally, Mayflower Wind would maintain an Oil Spill Response Plan (OSRP), an Incident Management Plan, and a Safety Management System. These plans would be in place before construction and installation activities begin and would be reviewed and approved by BOEM and BSEE.

2.2.1 Onshore Activities and Facilities

The onshore substation and converter station would be designed to serve as unmanned stations and would not have an operator onsite during typical operation. However, the substation and converter station would be inspected regularly and may require routine maintenance activities such as replacing or updating electrical components or equipment. The onshore export cables and the underground transmission cables would require periodic testing but should not require maintenance unless there is a failure.

2.2.2 Offshore Activities and Facilities

Routine maintenance is expected for WTGs, OSPs, and substructures. Mayflower Wind would conduct annual maintenance of WTGs, including safety surveys and inspections for signs of wear on WTG components (Mayflower COP Volume 1, Table 3-9; Mayflower Wind 2022). Routine inspections and maintenance of switchgear and other equipment would occur annually at OSPs. Substructures would be inspected every two years for damage to the substructure, cracks at welds, excessive marine growth, signs of corrosion, and seabed scour. The offshore export cables would not be expected to require regular maintenance, except for manufacturer-recommended cable testing.

Mayflower Wind would use vessels, remote-sensing equipment, vehicles, and aircraft during the O&M activities described above. The Project would use a variety of vessels to support O&M including crew-transfer vessels, service operation vessels, anchor-handling tugs, and jack-up vessels. In a year, the Proposed Action would generate a maximum of 100 crew-transfer vessel trips, 1 jack-up vessel trip, and 24 supply vessel trips; and a maximum of 250 helicopter trips (Mayflower COP Volume 1, Section

[2] Mayflower Wind's lease with BOEM (Lease OCS-A 0521) has an operational term of 33 years that commences on the date of COP approval. (See https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/MA/Lease-OCS-A-0521.pdf; see also 30 CFR 585.235(a)(3).) Mayflower Wind would need to request an extension of its operational term from BOEM to operate the proposed Projects for 35 years. For the purposes of maximum-case scenario and to ensure National Environmental Policy Act (NEPA) coverage if BOEM grants such an extension, the Draft EIS analyzes a 35-year operational term.

3.3.14.2, Table 3-23; Mayflower Wind 2022). Additional vessels/vehicles may be used as needed (e.g., ROV for inspections/repairs).

2.3 Decommissioning

Under 30 CFR 585 and commercial Renewable Energy Lease OCS-A 0521, Mayflower Wind would be required to remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seabed of all obstructions created by the proposed Project. All foundations would need to be removed 15 feet (4.6 meters) below the mudline (30 CFR 585.910(a)). Absent permission from BOEM, Mayflower Wind would have to achieve complete decommissioning within two years of termination of the lease and either reuse, recycle, or responsibly dispose of all materials removed. Mayflower Wind has submitted a conceptual decommissioning plan as part of the COP, and the final decommissioning application would outline Mayflower Wind's process for managing waste and recycling proposed Project components (Mayflower COP Volume 1, Section 3.3.19; Mayflower Wind 2022). Although the proposed Project is anticipated to have an operational life of 35 years, it is possible that some installations and components may remain fit for continued service after this time. Mayflower Wind would have to apply for and be granted an extension if it wanted to operate the proposed Project for more than the 33-year operations term stated in its lease.

BOEM would require Mayflower Wind to submit a decommissioning application upon the earliest of the following dates: 2 years before the expiration of the lease, 90 days after completion of the commercial activities on the commercial lease, or 90 days after cancellation, relinquishment, or other termination of the lease (30 CFR 585.905). Upon completion of the technical and environmental reviews, BOEM may approve, approve with conditions, or disapprove the lessee's decommissioning application. This process would include an opportunity for public comment and consultation with municipal, state, and federal management agencies. Mayflower Wind would need to obtain separate and subsequent approval from BOEM to retire in place any portion of the proposed Project. Approval of such activities would require compliance under NEPA and other federal statutes and implementing regulations.

If the COP is approved or approved with modifications, Mayflower Wind would have to submit a bond (or another form of financial assurance) prior to installation that would be held by the U.S. government to cover the cost of decommissioning the entire facility in the event that Mayflower Wind would not be able to decommission the facility.

2.3.1 Onshore Activities and Facilities

At the time of decommissioning, some components of the onshore electrical infrastructure may still have substantial life expectancies. Onshore export and transmission cables would likely be retired in place; however, if removal would be required, the cables would be pulled out of the transition vault and duct banks and sent to repurposing or recycling facilities. Depending on the needs at the time, the onshore facilities would be left in place for possible future use or demolished and materials recycled.

2.3.2 Offshore Activities and Facilities

For both WTGs and OSPs, decommissioning is anticipated to be the reverse of construction and installation, with turbine components or the OSP topside structure removed prior to foundation removal. Foundations that penetrate the seabed would be cut 15.0 feet (4.6 meters) below the mudline in accordance with 30 CFR 595.910 or may be removed completely. Mayflower Wind would assess the removal of scour protection and select a strategy that minimizes environmental impacts. Decommissioning of the topside structures for WTGs and offshore substations would include removal of all WTG components including removal of the rotor, nacelle, blades and tower and removal of the OSPs

topside structures. Materials would be brought onshore for recycling and disposal. Interarray cables and offshore export cables may be retired in place or extracted from the seabed via dredging vessels.

2.4 Relevant Alternatives to the Proposed Action

BOEM considered four relevant alternatives to the Proposed Action (Alternatives C through F in the EIS) (Table 3). Additional information on these alternatives (including figures, where applicable) can be found in EIS Chapter 2.

Table 3. Alternatives considered for analysis

Alternative	Description
Alternative C: Fisheries Habitat Minimization	Under Alternative C, the construction, operations and maintenance, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters outlined in the Mayflower Wind COP, subject to applicable mitigation measures. However, the Project includes an Onshore Export Cable route which would avoid placing a portion of the Offshore Export Cable Corridor in the Sakonnet River to avoid impacts to fisheries habitats. Alternative C includes two possible onshore export cable routes (see EIS Chapter 2, Figure 2-6): **Alternative C-1: Aquidneck Island, Rhode Island Route.** The Onshore Export Cable route runs the length of Aquidneck Island with two variations, eastern and western. From landfall at Second Beach, the western variation of the Onshore Export Cable route would proceed inland through Middletown for 4.1 miles before reaching Route 138, while the eastern variation would proceed for 4.0 miles. Both segments pass by wetlands, parks, and reserves, and both segments pass through natural heritage areas. The western and eastern variations rejoin at the intersection of Route 138 and Mitchell's Lane, continuing north on Route 138 into Portsmouth (4.5 miles). Route 138 is a four-lane road without paved shoulders, abutted by commercial properties and some residences. The onshore export cables would generally be located within existing public road ROW that may include the road shoulder and medians but may also include off-road areas such as private property and transmission ROWs, and could involve crossings of streams, wetlands, and other sensitive areas. When the route reaches Boyd's Lane it follows the same route as the Proposed Action to Brayton Point, including the three options for entering Mount Hope Bay (via HDD). Alternative C-1 would reduce the total offshore export cable route by 9 miles (14 kilometers) and increase the total onshore export cable route by 9 miles (14 kilometers). **Alternative C-2: Little Compton/Tiverton, Rhode Island Route.** From the landfall on the ocean-facing side of Breakwater Point, the Onshore Export Cable route follows Route 77 through Little Compton and into Tiverton, eventually turning east to Route 177 upon reaching Mount Hope Bay (for 15.8 miles total). Both Route 77 and Route 177 are two-lane roads with minimal paved shoulders. Other roads along the route are narrow two-land roads without paved shoulders, and Schooner Drive ends at the bottom of a hill, where there is an open area with a cul-de-sac which could serve as the onshore HDD installation area for cable entrance into Mount Hope Bay. Schooner Drive also includes a bridge over an abandoned railroad ROW, which would require a trenchless installation method. Similar to Alternative C-1, Alternative C-2 would mostly be located in road ROWs but may also cross private property and transmission and railroad ROW. Alternative C-2 would reduce the total offshore export cable route by 12 miles (19 kilometers) and increase the total onshore export cable route by 13 miles (21 kilometers).

Alternative	Description
Alternative D: Nantucket Shoals	Under Alternative D, the construction, operations and maintenance, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters outlined in the Mayflower Wind COP, subject to applicable mitigation measures. However, up to 6 WTGs (AZ-47, BA-47, BB-47, BC-47, BC-48, and BF-49) would be eliminated in the northeastern portion of the Lease Area to reduce potential impacts on foraging habitat and potential displacement of wildlife from this habitat adjacent to Nantucket Shoals.
Alternative E: Foundation Structures	Under Alternative E, the construction and installation, operations and maintenance, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters, which includes a range of foundation types (monopile, piled jacket, suction bucket, and gravity based), subject to applicable mitigation measures. This alternative includes three foundation options, which assume the maximum use of piled (monopile and piled jacket), suction bucket, and gravity-based foundation structures to assess the extent of the potential impacts from each foundation type. For all three foundation options, a total of 149 structures would be used to support up to 147 turbines and up to five OSPs. • **Alternative E-1: Piled Foundations (Monopile and Piled Jacket) Only.** See EIS Chapter 2, Figure 2-8. • **Alternative E-2: Suction Bucket Foundations Only**. See EIS Chapter 2, Figure 2-9. • **Alternative E-3: Gravity-Based Foundations Only.** See EIS Chapter 2, Figure 2-10.
Alternative F: Muskeget Channel Cable Modification	Under Alternative F, the construction, operations and maintenance, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters outlined in the Mayflower Wind COP, subject to applicable mitigation measures. However, to minimize seabed disturbance in the Muskeget Channel, the Falmouth Offshore Export Cable route would use ±525kV HVDC cables connected to one HVDC converter OSP, instead of HVAC cables connected to one or more HVAC OSPs , and would only use up to three offshore export cables, instead of up to five offshore export cables. Alternative F would ultimately result in a total of two OSPs, one HVDC converter OSP for Brayton Point and one HVDC converter OSP for Falmouth.

3. Action Area

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). Therefore, the Action Area for constructing, operating, and decommissioning the proposed Project includes the onshore and offshore Project elements plus a 1-mile buffer around these elements to account for potential noise, human presence, and visual disturbance associated with constructing, operating, and decommissioning the proposed Project. For this BA, the Action Area includes the overland cable routes proposed for Alternative C in order to reflect the maximum potential effects of project activities on terrestrial and coastal species (Figure 6). Because some Project elements are separated by considerable distance, BOEM split the Action Area into 13 separate areas for the purpose of generating an accurate threatened and endangered species list (using IPaC) for the different Project elements. The 13 separate areas include the Lease Area, both offshore ECCs, Falmouth onshore cable route, both Falmouth substations, Falmouth underground transmission route, Brayton Point onshore cable routes, Brayton Point Converter station, Brayton Point construction easements, and all three Aquidneck Island onshore cable routes; collectively, these areas compose the overall Action Area.

3.1 General Description of the Action Area

The onshore portions of the Action Area are within Falmouth, Aquidneck Island, and Brayton Point. The Falmouth Onshore Project area falls within the Cape Cod Coastal Lowland and Islands Ecoregion of the Atlantic Coastal Pine Barrens (Griffith et al. 2009). This ecoregion is characterized by terminal moraines and outwash plains left by receding glaciers that include habitats such as forests, wetlands, grasslands, scrub-shrub, and fragmented vegetated areas. Most of the land in the Falmouth Onshore Project area is disturbed or developed, with portions of relatively undisturbed land.

The Brayton Point and Aquidneck Island Onshore Project areas are within the Narragansett-Bristol Lowland and Island Ecoregion of the Northeastern Coastal Zone (Griffith et al. 2009; Swain 2020). This ecoregion contains many wetlands, low-gradient streams, and oak and oak-pine forests with combinations of central hardwood species (Swain 2020). The intermediate landfall site on Aquidneck Island is highly urbanized and, therefore, the species inhabiting that environment have likely adapted to living in urban environments. The onshore cable routes under Alternative C-1, which traverses Aquidneck Island for approximately 12 miles (19 kilometers), and Alternative C-2, which extends for nearly 16 miles (26 kilometers) through Little Compton and Tiverton, also occur within the Narragansett-Bristol Lowland and Islands Ecoregion.

The offshore portion of the Action Area includes open waters within a 1-mile buffer around the ECCs and Lease Area, within the Massachusetts WEA (Figure 6).

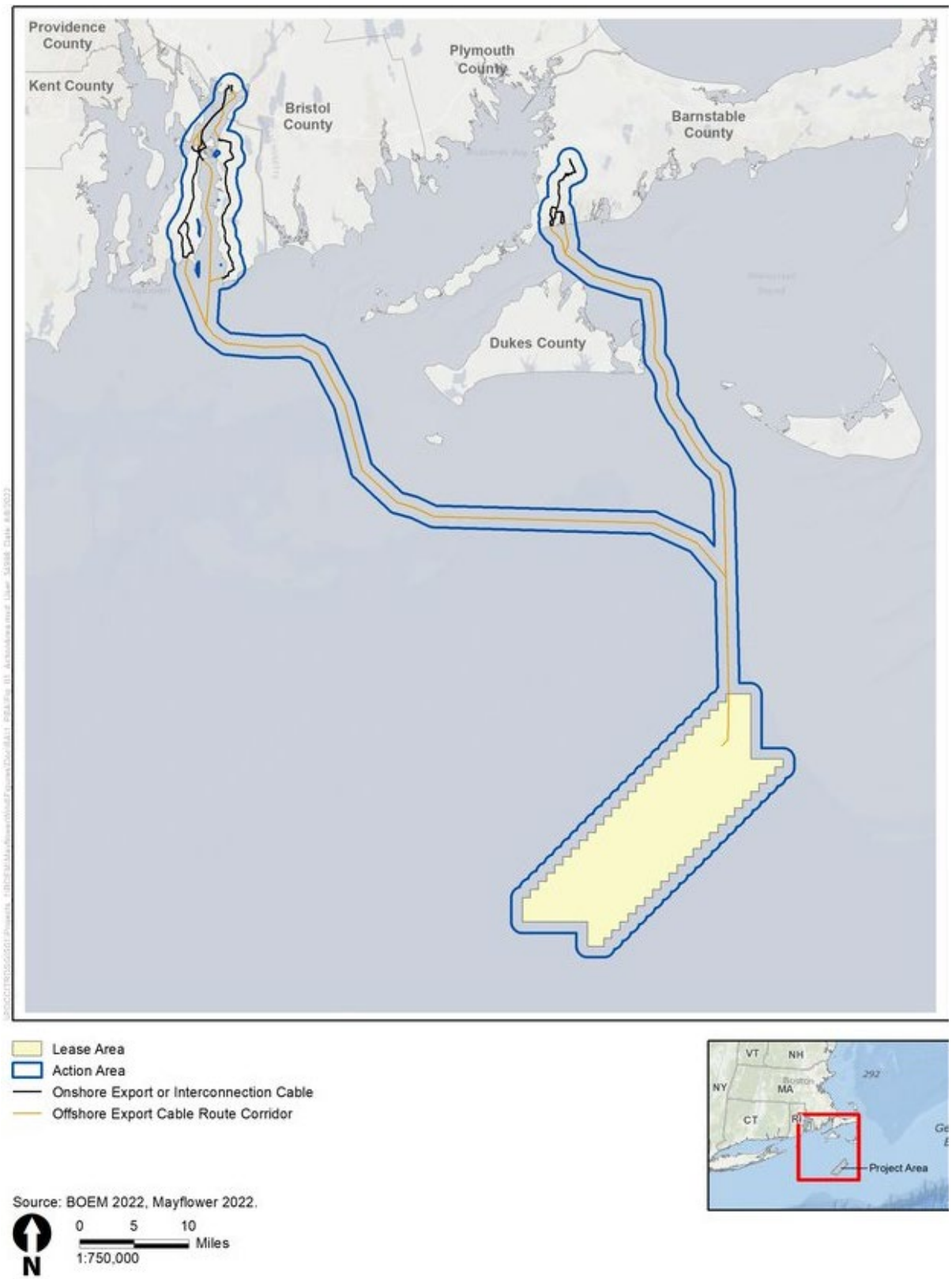


Figure 6. Mayflower Wind Action Area

4. Covered Species

Three federally listed birds, one federally listed flowering plant, one federally listed bat, one candidate insect, and one bat proposed to be listed as endangered under USFWS jurisdiction occur or potentially occur in all or portions of the Action Area, depending on species and Project element (Table 4). There are no critical habitats for these or any other federally listed species designated within the Action Area. Data sources used for the analysis are discussed in Section 4.1, and a description of each species and the potential occurrence in the Action Area is provided in Sections 4.2 through 4.7. 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 could occur within the offshore environment regardless of IPaC results shown in Table 4. For the remaining species (sandplain gerardia), the potential effects within the Action Area would be more localized and restricted to the areas affected by the onshore Project elements. Additionally, the northern red-bellied cooter (*Pseudemys rubriventris pop. 1*) has isolated populations in Massachusetts that were previously recognized as a separate subspecies. The Massachusetts Division of Fish and Wildlife (MA DFW) lists the "Plymouth" Red-bellied Cooter as endangered and USFWS still recognizes this Massachusetts population as federally endangered, as an ecologically and geographically distinct population segment (DoD PARC 2020). Although this subspecies was identified in the Mayflower Wind COP Volume 2 as potentially occurring in the Falmouth, recent IPaC results did not identify this subspecies as occurring in the Action Area and is therefore not considered further in this BA.

Table 4. Threatened, Endangered, Candidate, or proposed species that occur or potentially occur in the Action Area based on IPaC

Species	Lease Area	Falmouth OECC	Brayton Point OECC	Falmouth Onshore	Brayton Point Onshore	Aquidneck Island Onshore	Habitat(s)
Northern long-eared bat (E) (*Myotis septentrionalis*) [a]	No	Yes	Yes	Yes	Yes	Yes	Winter habitat: hibernacula in caves and mines; Summer habitat: roost and maternity trees with loose bark or cavities near wetlands/open water; forages in open forests, edges, and around wetlands or water (NHESP 2019).
Tricolored bat (PE) (*Perimyotis subflavus*) [b]	No	Yes	Yes	Yes	Yes	Yes	Winter habitat: hibernacula in caves and mines; Spring, Summer, and Fall Habitat: primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees. May also roost in structures (e.g., barns, bridges). Forages around water and forest edges (NHESP 2015).
Piping plover (T) (*Charadrius melodus*)	No	No	No	Yes	No	No	Nesting habitat: sandy coastal dunes and beaches flat and free of vegetation in the narrow land between high tide line and foot of coastal dunes, and in least tern colonies (NHESP 2015a).
Rufa red knot (T) (*Calidris canutus rufa*)	No	Yes	No	No	No	No	Foraging habitat: intertidal areas, sandy beaches, tidal mudflats, salt marshes, and peat banks (NHESP 2020).
Roseate tern (E) (*Sterna dougallii dougallii*)	Yes	Yes	Yes	Yes	No	Yes	Breeding habitat: gravelly, sandy, or rocky islands and less commonly at ends of long barrier beaches (NHESP 2015b). Nesting habitat: dense vegetation such as beach pea and seaside goldenrod (NHESP 2015b). Foraging habitat: offshore and in shoals, inlets, and shallow sandbars (NHESP 2015b) Roosting habitat: flocks near tidal inlets (Mayflower Wind 2022).
Monarch butterfly (C) (*Danaus plexippus*) [c]	No	No	Yes	Yes	Yes	Yes	Areas near flowering plants and milkweed (USFWS 2022a).
Sandplain gerardia (E) (*Agalinis acuta*)	No	Yes	No	Yes	No	No	Sandy dry soils of roadsides and grasslands within pine/oak scrub openings often associated with growth of lichens and scattered patches of bare soil and in sandy plains (NHESP 2015c).

Source: Appendix A.
[a] USFWS has reclassified the northern long-eared bat as endangered, effective March 31, 2023.
[b] Tricolored bat does not show up on IPaC, but the species range includes Massachusetts and Rhode Island and suitable habitat is generally similar to northern long-eared bat.
[c] Candidate species are provided no statutory protection under the ESA.
OECC = offshore export cable corridors; C = candidate for federal listing; E = federally listed as endangered; PE = Proposed Endangered; T = federally listed as threatened

4.1 Data Sources for Analysis

Bird data sources that cover the offshore Action Area consist of numerous avian survey efforts by federal and state agencies over many years, as well as surveys conducted by Mayflower. These surveys are summarized in Table 5, with more detail provided in COP Volume 2, [Appendix I1. Secondary offshore bird data sources include the *Tracking Offshore Occurrence of Common Terns, Endangered Roseate Terns, and Threatened Piping Plovers with VHF Arrays* (Loring et al. 2019), *Tracking Movements of Common Terns, Endangered Roseate Terns, and Threatened Piping Plovers in the Northwest Atlantic: 2017 Annual Report to the Bureau of Ocean Energy Management* (Loring et al. 2017), *Tracking Movements of Migratory Shorebirds in the US Atlantic Outer Continental Shelf Region* (Loring et al. 2020), *Tracking Movements of Threatened Migratory Rufa Red Knots in US Atlantic Outer Continental Shelf Waters* (Loring et al. 2018), and the Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New Jersey, Delaware, Maryland, and Virginia Final Environmental Assessment.

Table 5. Primary bird data sources covering the Offshore Action Area

Study	Organization	Location	Dates	Methods
MDAT Models	BOEM, NOAA, USGS et al.	Atlantic OCS and adjacent waters: FL to ME	Integrated survey data from 1978 through 2016	Aerial and boat-based visual surveys conducted at various times during this period
MCEC	Massachusetts Clean Energy Center	MA and RI OCS Wind Lease Areas	Thirty-eight surveys from November 2011 through January 2015	Aerial seabird surveys across 23,000 linear kilometers of transects
HD Aerial Surveys	Mayflower Wind	Mayflower Wind Lease Area	Monthly surveys from November 2019 through October 2020. Two surveys during April, May, and August 2020	HD aerial imagery: nine lines spaced 2 kilometers across-track within the Lease Area with a 1 nautical mile buffer
Geophysical and Geotechnical Surveys	Mayflower Wind	Mayflower Wind Lease Area	Surveys from September through November 2019	Vessel surveys with no systematic survey design

MDAT = Marine-Life Data and Analysis Team; MCEC= Massachusetts Clean Energy Center; HD = high-definition; FL = Florida; ME = Maine; MA = Massachusetts; RI = Rhode Island; OCS = outer continental shelf

BOEM also reviewed the USGS *Gap Analysis Project (GAP) Species Predicted Habitat Maps and Range Maps* to identify potential onshore habitats (USGS 2018), as well as habitat information provided in the COP. USGS GAP predicted habitat models represent the areas where species are predicted to occur based on habitat associations. The models represent the spatial arrangement of environments suitable for occupation by a species. In other words, a species distribution is created using a deductive model to predict areas suitable for occupation within a species range. To represent these suitable environments for each species' habitat distribution model, USGS used the land cover and other ancillary datasets (as listed in the metadata). USGS states that its goal is to build species range maps and distribution models with the best available data for assessing conservation status, conservation planning, and research.

The eBird database was also reviewed to identify potential presence of piping plover, *rufa* red knot, and roseate tern in the vicinity of the onshore Project elements. In addition, various literature sources were used to supplement the information BOEM has compiled about potential effects on federally listed species from other offshore wind projects on the OCS, including peer-reviewed literature, USFWS 5-year

reviews, USFWS species status assessments, *Federal Register* publications (i.e., listing rules), recovery plans, recent USFWS biological opinions, recent USFWS BAs from South Fork Wind and Vineyard Wind, and various websites.

Potential habitat and occurrences of the northern long-eared bat and the tricolored bat in the vicinity of the Action Area were identified through a review of offshore and onshore monitoring studies covering the Action Area and the northeast, *Federal Register* publications, recent USFWS BAs, peer-reviewed literature, probability estimations by USGS using North American Bat Monitoring Program data (USGS 2019; Udell et al. 2022), and USGS GAP data (USGS 2018). Additionally, the natural communities present within the onshore Action Area from the COP Volume 2, [Appendix J] were reviewed to identify potential habitat.

To identify potential habitat and occurrences of the monarch butterfly in the vicinity of the onshore and offshore Project elements, *Federal Register* publications, USFWS species status assessments, in addition to peer-reviewed literature were reviewed. Additionally, milkweed presence in the vicinity of the onshore Action Areas was examined through surveys conducted at Camp Edwards, Native Plant Trust, various literature and websites, and a review of the natural communities present from COP Volume 2, Appendix J (Mayflower Wind 2022). To identify potential habitat and occurrences of sandplain gerardia in the vicinity of the Action Area, BOEM reviewed *Federal Register* publications, USFWS 5-year reviews, peer-reviewed literature, and natural habitats present within the onshore Action Area from the COP Volume 2, Appendix J (Mayflower Wind 2022).

Additionally, consultations between the National Heritage and Endangered Species Program (NHESP) and Rhode Island Department of Environmental Management (RIDEM) were conducted to provide information on species present in the Falmouth and Brayton Point onshore Action Areas.

4.2 Northern Long-Eared Bat

4.2.1 Species Description

The federally endangered northern long-eared bat occurs throughout Massachusetts, including Cape Cod, Martha's Vineyard, Nantucket, and throughout Rhode Island. This species has declined by 97 to 100 percent in most locations due to impacts from white-nose syndrome (WNS), caused by the fungus *Pseudogymnoascus destructans* (*P.d.*), especially in the Northeast; declines are expected to continue as WNS continues to spread (USFWS 2016). This fungus causes infections in bats which ultimately may increase the frequency and duration of arousals during hibernation which can result in mortality as their fat reserves become depleted (87 *Federal Register* 16442). WNS was confirmed present in Massachusetts in 2008 and Rhode Island in 2016 (USFWS 2018a; Whitenosesyndrome.org 2022).

Given observed drastic population declines, USFWS listed the Northern long eared bat as threatened in 2015 throughout its range (80 *Federal Register* 17974). On January 14, 2016, USFWS published a final ESA §4(d) Rule that specifically defines "take" prohibitions and exempts most incidental take for a variety of commercial and industrial projects within the species range (81 *Federal Register* 1900). Specifically, incidental take of northern long-eared bat is exempt from prohibition if the following criteria are met:

- No impacts on known occupied hibernation sites;
- No tree removal within 0.25 mile (0.4 kilometer) of a known occupied hibernation site; and
- No tree removal within 150 feet (45.7 meters) of a known occupied maternity roost tree between June 1 and July 31.

In 2016, USFWS additionally determined that designating critical winter and summer habitat for the northern long-eared bat was not prudent (81 *Federal Register* 24707). A proposed rule by USFWS was published on March 23, 2022, to reclassify the northern long-eared bat as an endangered species and remove its species-specific 4(d) rule (87 *Federal Register* 16442). On November 30, 2023, USFWS reclassified the northern long-eared bat as an endangered species and removed the species-specific rule issued under section 4(d) of the Act (87 *Federal Register* 73488). After delaying the original effective date of January 30, 2023, this rule will be effective March 31, 2023. Additionally, the northern long-eared bat is listed as Endangered under the Massachusetts ESA (Mass Wildlife 2020) and identified as a Species of Greatest Conservation Need in Rhode Island (RIDEM 2015).

The northern long-eared bat is an insectivore which feeds on moths, flies, leafhoppers, caddisflies, and beetles approximately 3 to 10 feet (1 to 3 meters) above the ground (Brack and Whitaker 2001) in open forests, edges, and around ponds, streams, and wetlands. Similar to most bats, the northern long-eared bat emerges at dusk and uses echolocation to hunt for insect or by gleaning motionless insects from vegetation. The annual life-cycle of the northern long-eared bat includes winter hibernation (caves and mines), spring staging, spring migration, summer birth of young, fall migration, and fall swarming and mating. In spring, the bats leave their hibernacula to roost in trees and forage near the hibernaculum in preparation for migration. From approximately mid-May through mid-August, northern long-eared bats occupy summer habitat. Trees used are typically greater than or equal to 3 inches (7.6 centimeters) diameter at breast height, within 1,000 feet (305 meters) of forest. Northern long-eared bats roost under bark and in cavities or crevices of both live and dead trees (Foster and Kurta 1999; Owens et al. 2002; Perry and Thill 2007a; Sasse and Perkins 1996), as well as in anthropogenic structures (Amelon and Burhans 2006; Timpone et al. 2010). Although most northern long-eared bats are opportunistic in regard to tree-roost selection, depending on the reproductive stage of female northern long-eared bats, roost-site selection with respect to canopy cover and height may change. Females are known to roost in small maternity colonies and males roost alone (Amelon and Burhans 2006). A recent study on northern long-eared bats on Nantucket documented up to 18 bats sharing a maternity roost (Dowling 2017). Northern long-eared bats also switch roosts frequently, typically every two to three days (Carter and Feldhamer 2005; Foster and Kurta 1999; Owen et al. 2002; Timpone et al. 2010). Northern long eared bats forage relatively close (a few kilometers) to their roost sites (Sasse and Perkins 1996; Timpone et al. 2010). Compared to migratory tree-roosting bat species, northern long-eared bats are short-distance migrants and are thought to have a small home range of less than 25 acres (10 hectares; Silvis et al. 2016 as cited in Dowling et al. 2017). During the fall migration, individuals congregate in the vicinity of their hibernacula in August or September and enter hibernacula in October and November. An individual will use the same hibernaculum for multiple years.

4.2.2 Northern Long-Eared Bat in the Action Area

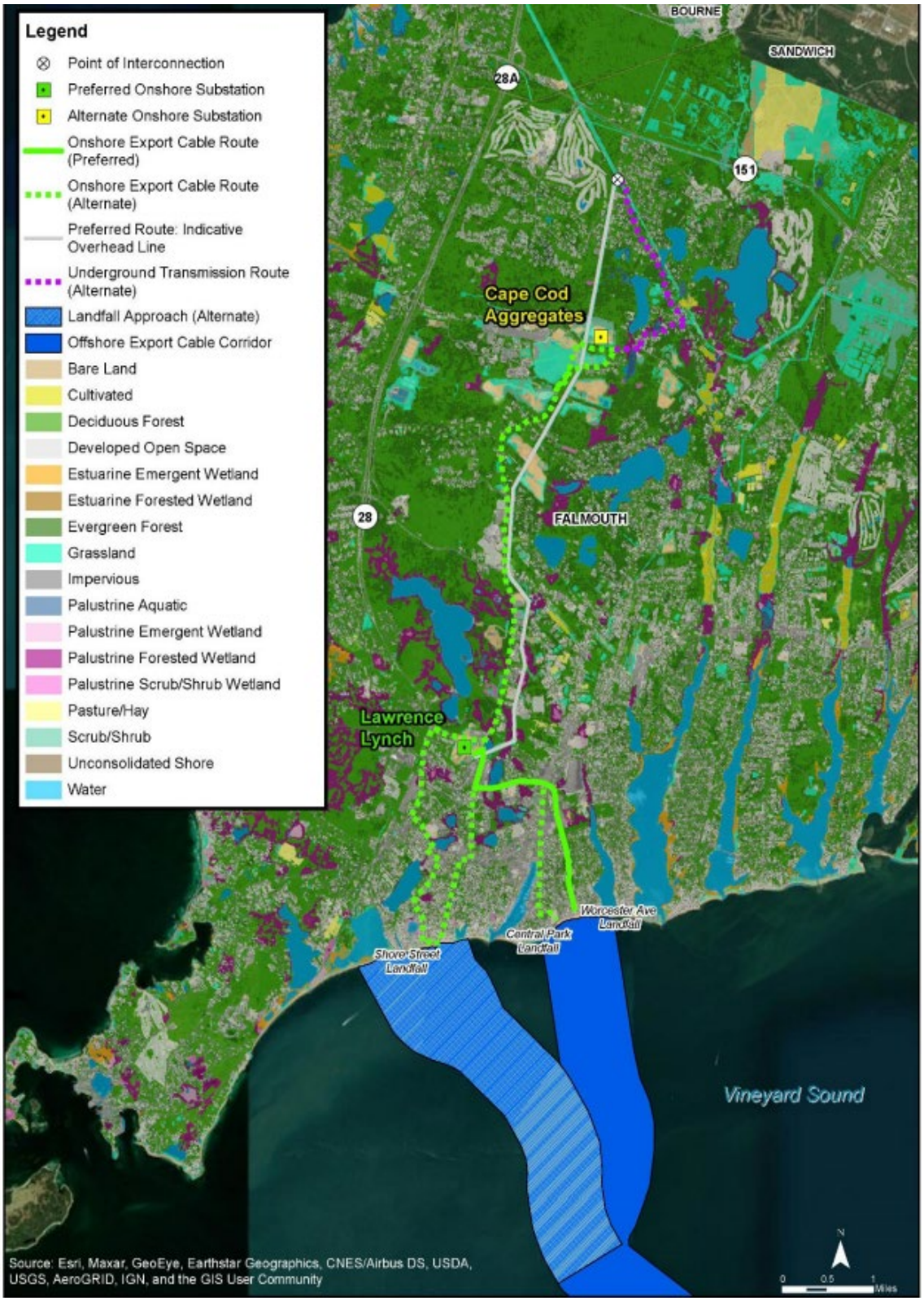
There are no records of northern long-eared bats on the OCS, and the available bat survey data suggest there is little evidence of use of the offshore environment (Pelletier et al. 2013; ESS Group, Inc. 2014; Hatch et al. 2013; Sjollema et al. 2014; Smith and McWilliams 2016; Dowling et al. 2017). In addition, the USGS's NABat Status and Trends data indicate that northern long-eared bat summer occupancy is lower along the Atlantic coast and higher in interior areas (Udell et al. 2022). Although no surveys have been conducted for Northern-long eared bats within the Lease Area, BOEM anticipates limited use of the offshore environment by the northern long-eared bat, and exposure to the Wind Farm Area, if occurs, is anticipated to be minimal.

Because research on the movements of these bats in the marine environment is limited, there remains uncertainty on if this species travels offshore. However, a long-term study of bat movements in the Gulf of Maine and Great Lakes detected unidentified *Myotis* species which in some instances undertook flights around 40 kilometers offshore (Stantec 2016). Additionally, during geo surveys for South Fork Wind, 2 acoustic bat detectors were deployed on the Fugro Enterprise vessel railing from July 14 to November 15,

2017, and out of 896 passes identified, 34 calls were identified as the northern long-eared bat with one detection documented in the South Fork Wind Farm area. A majority of the passes occurred during low wind speeds (Stantec 2018).

A recent tracking study (n = 8; July–October 2016) conducted on Martha's Vineyard did not record any offshore movements of the northern long-eared bat and presented evidence of northern long-eared bats hibernating on Martha's Vineyard and Nantucket islands (Dowling et al. 2017). Stationary acoustic detectors positioned on two WTGs within the operational Block Island Wind Farm (Rhode Island) did not detect any northern long-eared bat calls (Stantec 2020). In addition, bird and bat monitoring (August 2021 to November 2021) for Dominion Energy's Coastal Virginia Offshore Wind (CVOW) pilot project 27.0 miles (43.4 kilometers) off the coast of Virginia Beach, Virginia, did not detect any northern long-eared bats (Dominion Energy 2022). Therefore, given the rarity of the bat in this region, its ecology, and habitat requirements, it is extremely unlikely northern long-eared bats would traverse the offshore portions of the Action Area. If northern long-eared bats were to migrate over water, movements would likely be near the mainland and limited to periods of low wind speeds, during which the WTGs may not be operational if winds are below the cut in speed. Northern long-eared bats are unlikely to be exposed to WTGs within the Lease Area, which is 29.8 miles (48.0 kilometers) south of Martha's Vineyard, 23.0 miles (37.0 kilometers) south of Nantucket, and 44.7 miles (72.0 kilometers) from the mainland at Nobska Point in Falmouth, Massachusetts.

The Action Area covering the onshore Project elements in Falmouth is classified as a Pine Barren (84) level III ecoregion by the U.S. Environmental Protection Agency (USEPA) and further classified as Cape Cod Coastal Lowlands and Islands Ecoregion by the MA DFW with vegetation that consists of stunted oaks (Quercussp.; primarily scrub oak [*Quercus ilicifolia*]) and pines (*Pinus* sp.; primarily pitch pine [*Pinus rigida*]) (Swain 2020). The evergreen forest group within the onshore Action Areas consists predominantly of Pitch Pine-Oak Forest Woodland and is one of the dominant natural communities surrounding the onshore Action Areas. For a list of all natural communities in the Falmouth onshore Action Area, see Figure 7.



Data Source: Mass GIS 2018; NatureServe 2018

Figure 7. Location and extent of natural communities in the Falmouth Onshore Project area and surrounding landscape

Although Mayflower did not conduct a survey to identify bat presence within the Falmouth onshore Action Area, the northern long-eared bat is known to primarily occur in the eastern part of the state during hibernation and on Cape Cod during the maternity roosting period. Several acoustic, telemetry, and mist-netting surveys at Camp Edwards Joint Base Cape Cod located 8.1 miles (13.1 kilometers) from the Falmouth POI and proposed onshore substation site in Falmouth have confirmed the presence of northern long-eared bats on Cape Cod; although no roosts have been identified within 0.25 miles (0.4 kilometers) of the proposed Project footprint (Figure 8; Tetra Tech, 2017, 2015; WEST, 2017; Tetra Tech et al. 2015). The nearest maternity colonies have been documented 34.8 miles (56.0 kilometers) east near Sandwich, Massachusetts, and the nearest hibernaculum recorded 40.4 miles (65.0 kilometers) north in Wellesley, Massachusetts (Mass Wildlife 2022). Additionally, the existing transmission line corridor is adjacent to extensive contiguous forest which contains known maternity colonies of the northern long-eared bat (Mayflower Wind 2022). As stated above, caves and mines serve as crucial habitat that are used by northern long-eared bats as winter hibernacula. However, the onshore substation locations are not expected to contain winter hibernacula for any bat species, including caves and mines.

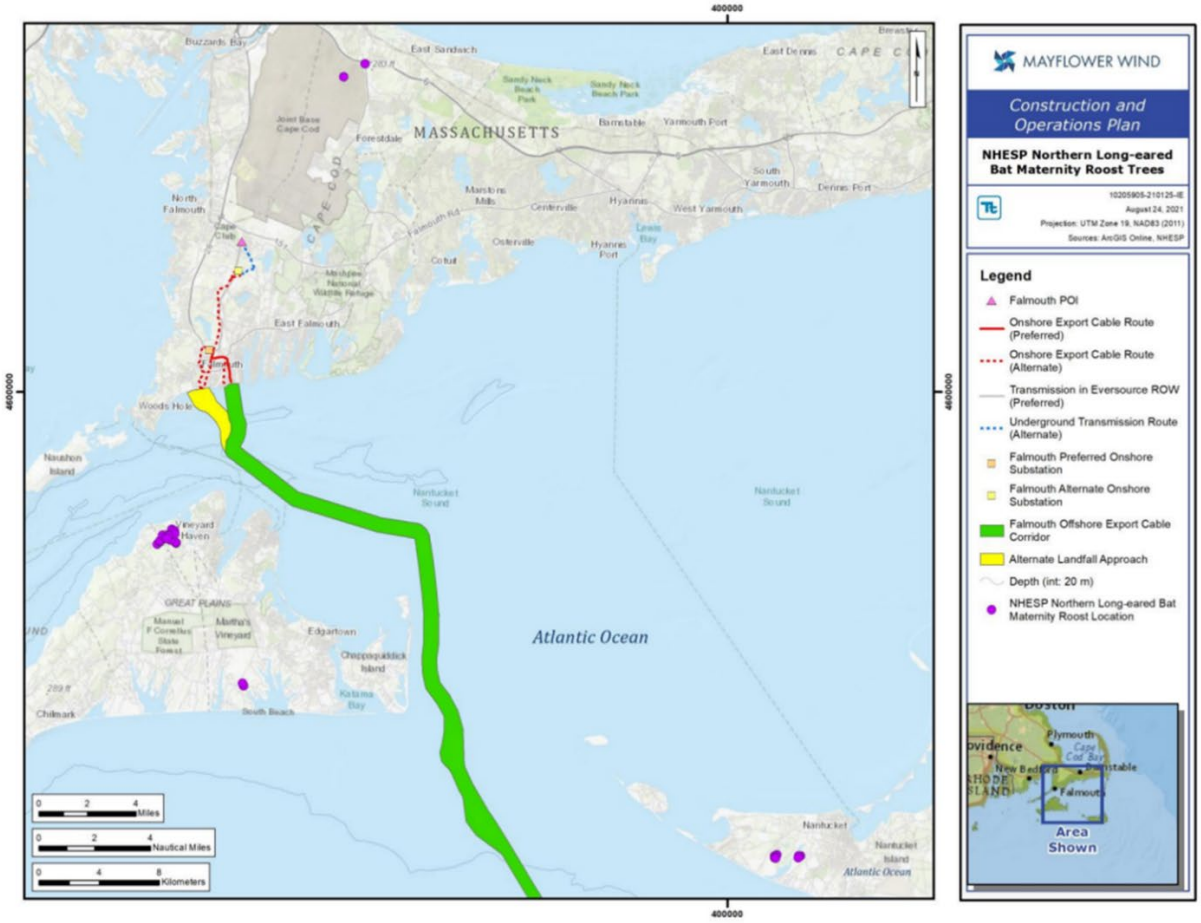


Figure 8. NHESP northern long-eared bat maternity roost locations

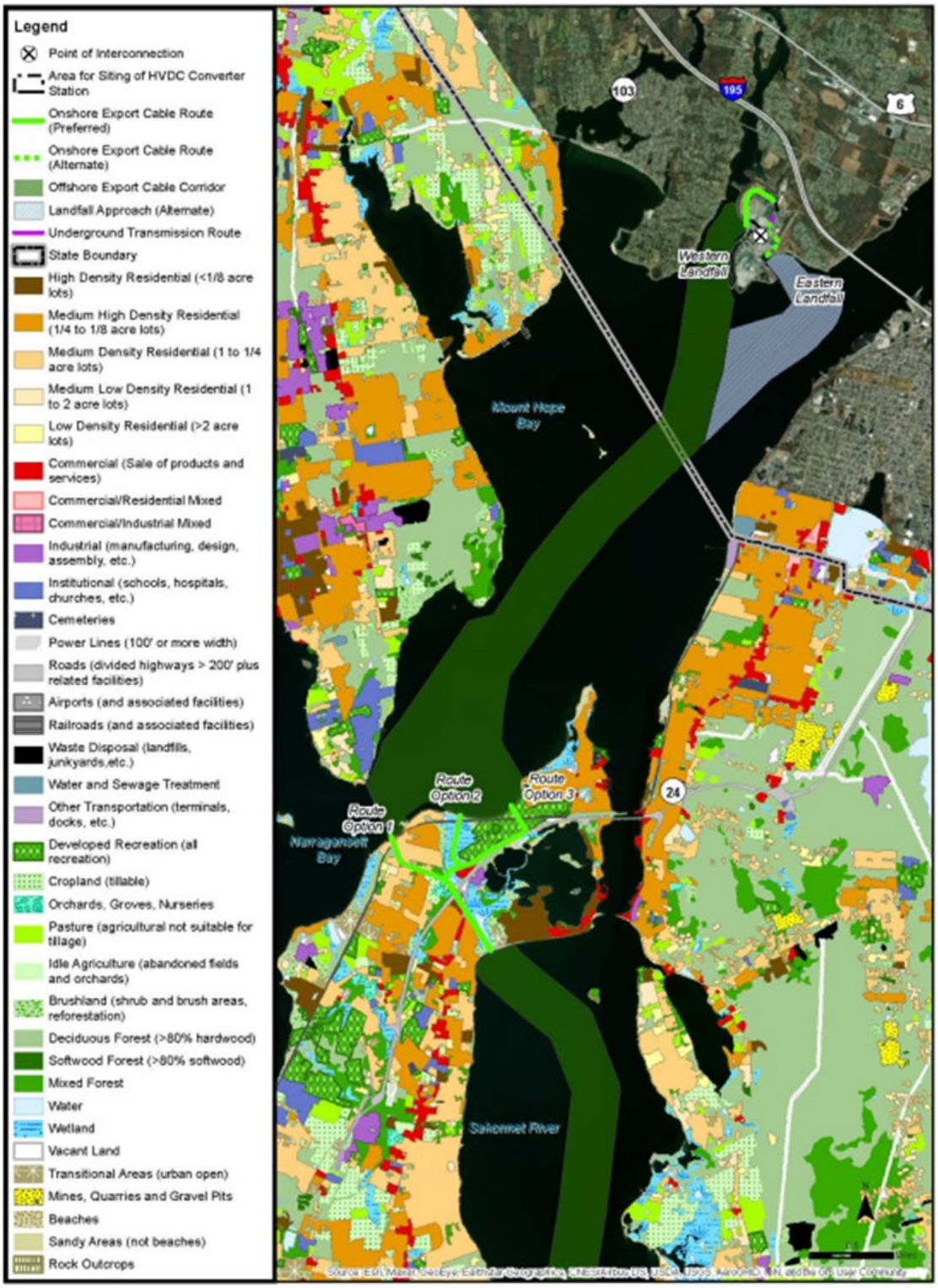
Information was requested from the Massachusetts NHESP regarding the Priority Habitats (PH) and Estimated Habitats (EH) crossed by the Action Areas in Falmouth. EHs are a sub-set of PHs and are further based on the geographic extent of habitat of state-listed rare wildlife. Within or near the Falmouth onshore Action Area, there are 10 mapped PHs including 176, 887, 191, 205, 216, 214, 213, 220, 455, and 2158. Only PH 2158 is crossed by the Project footprint. The other PHs are near the Project corridor or fall just within the Project corridor. In a letter to Massachusetts NHESP dated June 29, 2022, information

was requested regarding state listed species which may potentially be present in the habitats traversed by the Falmouth onshore and offshore Action Areas. In response to that request, the Massachusetts NHESP responded in an email dated July 29, 2022, indicating all ten PHs do not contain records of the northern long-eared bat (E. Holt, personal communication).

The Brayton Point onshore Action Area is mainly sited within an existing industrial area. However, the natural environment is classified as a Northeastern Coastal Zone (59) level III ecoregion by the USEPA and is further classified by MA DFW as a Narragansett- Bristol Lowland Island Ecoregion. Aquidneck Island is classified by the USEPA as a Narragansett-Bristol Lowland region and vegetation varies with oak-pine forests and oak-hickory due to coastal influences, with cranberry bogs and wetlands abundant within the mixed forests. For a list of all natural communities in the Brayton Point onshore Action Area, see Figure 9.

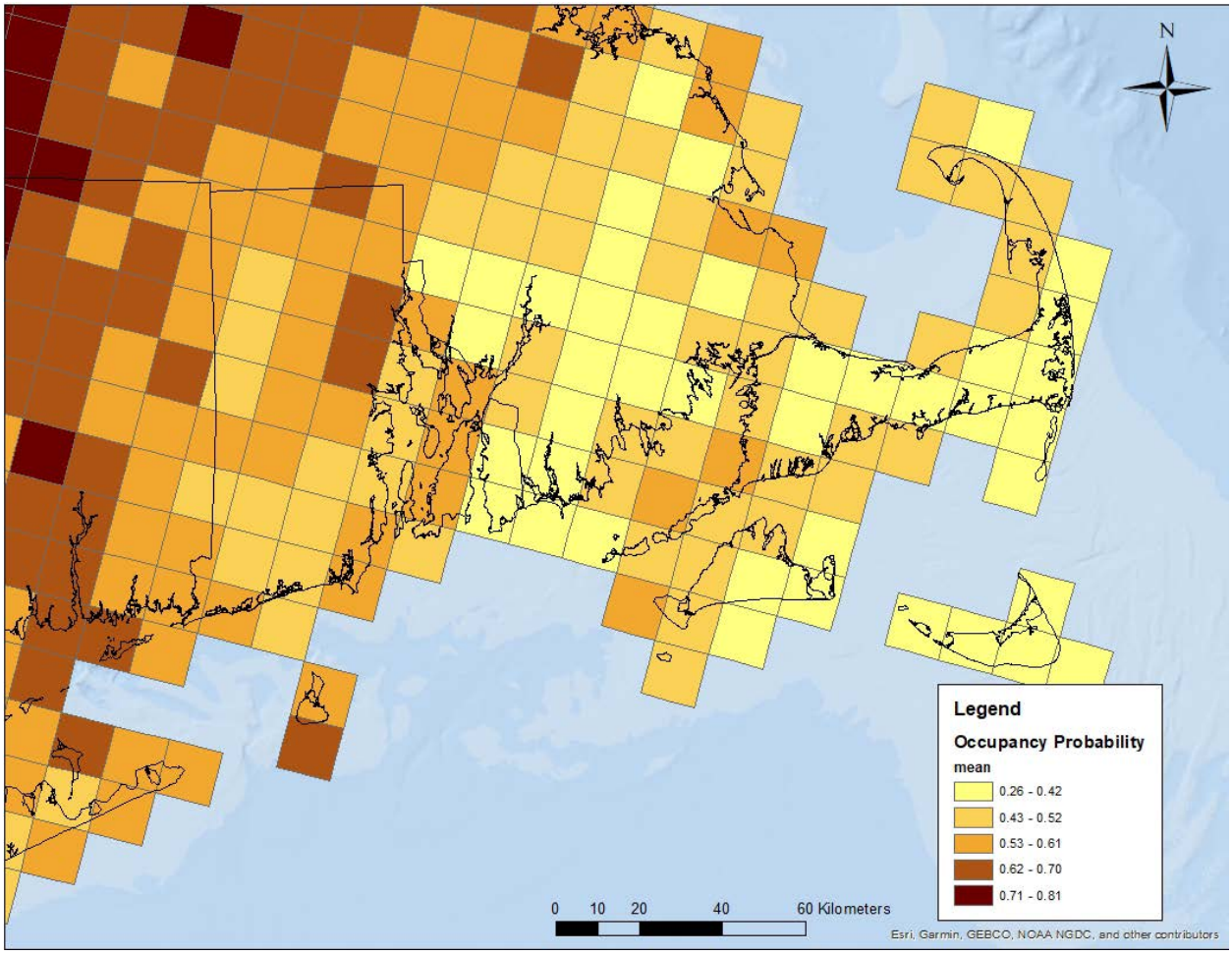
Portions of the Action Area in Aquidneck Island overlap Rhode Island Natural Heritage Areas. An information request was submitted by Mayflower Wind to the Rhode Island Natural Heritage Program in which a response was received June 24, 2021 regarding threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat within the Rhode Island portions of the Brayton Point export cable corridor (USFWS, P. Jordan, personal communication [two separate letters: one regarding Sakonnet River and Mount Hope Bay, the other Lower Narragansett], June 23, 2021). The northern long-eared bat was not identified as present in the Rhode Island portions of the Brayton Point export cable corridor. Furthermore, a 2019 analysis of summer occupancy of bats in North America shows the northern long-eared bat to have an average occupancy probability of less than 0.5 throughout Rhode Island, indicating a low likelihood of occurrence (Udell et al. 2022). An analysis of summer occupancy probability within 6.2-mile-by-6.2-mile (10.0-kilometer-by-10.0-kilomter) grid cells across the United States using data from 2010 to 2019 (Udell et al. 2022) estimated a 56 percent probability of occupancy in the grid cell containing the Brayton Point Action Area. The grid cell containing the Aquidneck Island onshore Action Area was estimated to have a 57 percent chance of summer occupancy. The Falmouth onshore Action Area is split between two grid cells, with a 53 percent probability in the west and a 43 percent probability in the east (Figure 10).

BOEM additionally reviewed the USGS GAP habitat data which did identify the northern long-eared bat as occurring or potentially occurring in the Action Area covering the onshore Project elements and portions of the offshore ECCs (Figure 11, Figure 12, and Figure 13). Consultations with NHESP and RIDEM did not indicate the presence of the northern long-eared bat. Based on survey and habitat community data, northern long-eared bat presence is not expected within the Brayton Point onshore Action Area and very little, if any, northern long-eared bat activity is expected within the Falmouth onshore Action Area. Should northern long-eared bats traverse the Falmouth onshore Action Area, their presence would occur during non-hibernation periods (May through October) while foraging and/or roosting.



Data Source: RIGIS, 2021

Figure 9. Location and extent of natural communities in the Brayton Point Onshore Project area and surrounding landscape



Source: Calculated by USGS (Udell et al. 2022)

Figure 10. Northern long-eared bat summer occupancy probability in Southern Massachusetts and Rhode Island within NaBat grid cells

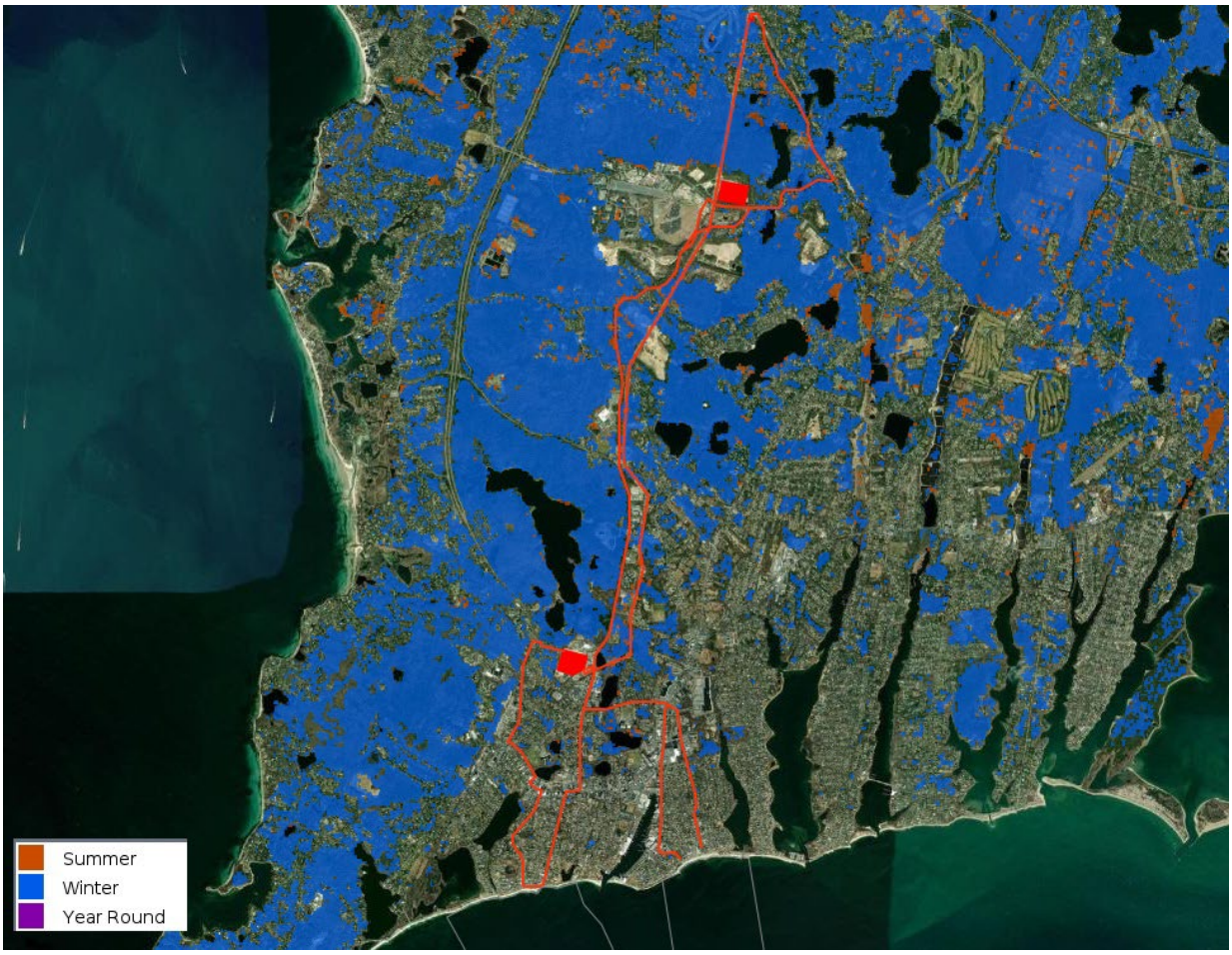


Figure 11. USGS GAP analysis northern long-eared bat predicted habitat range for Project onshore facilities in Falmouth

Figure 12. USGS GAP analysis northern long-eared bat predicted habitat range for Project onshore facilities in Aquidneck Island

Figure 13. USGS GAP analysis northern long-eared bat predicted habitat range for Project onshore facilities in Brayton Point

4.3 Tricolored Bat

4.3.1 Species Description

Formally known as the eastern pipistelle, the tricolored bat is one of the smallest bat species within North America (USFWS 2021c). The tricolored bat is currently not federally listed, but on September 14, 2022, USFWS issued a proposed rule to list the species as endangered, primarily due to impacts of WNS which is a deadly fungal disease affecting cave dwelling bats (87 *Federal Register* 56381). If USFWS finalizes the rule as proposed, it will add the tricolored bat to the List of Endangered and Threated Wildlife and extend the ESA's protection to the species. Additionally, the tricolored bat is listed as endangered under the Massachusetts ESA (Mass Wildlife 2020) and as a Species of Greatest Conservation Need in Rhode Island (RIDEM 2015).

The tricolored bat is the only member of its genus (Hoofer et al. 2006). It is a small bat, measuring 77 to 89 mm in total length. Females are consistently heavier than males. Weight fluctuates with season, in the fall, females weigh approximately 7.9 grams while males weigh 7.5 grams. Weight in the spring for females and males is approximately 5.8 grams and 4.6 grams, respectively (Fujita and Kunz 1984). The tricolored bat is distinguished by its unique tricolored fur that appears dark at the base, lighter in the middle and dark at the tip. They often appear yellowish, varying form pale yellow to nearly orange, but

may also appear silvery-gray, chocolate brown or black. Newly flying young are much darker and grayer than adults. The tricolored bat's range covers most of the eastern United States; spanning from Nova Scotia in the north, westward to Colorado, and into Mexico to the south (USFWS 2021c). Populations have declined sharply from historical levels. The tricolored bat was once the third most abundant bat found in Massachusetts caves. Initial population declines were due to heavy pesticide use in the mid-20th century. A gradual population recovery followed, until the outbreak of WNS. Infected populations in the Northeast U.S. have seen 90 percent reductions on average (NHESP 2015d).

Tricolored bats are insectivores, feeding on a variety or insects including moths, beetles, wasps, ants and flies. They commonly feed over waterways and forest edges. At early evening hours, tricolor bats will feed at treetop level or above. Foraging height lowers closer to ground level later in the evening and into the night. (USFWS 2021c). Their foraging area may be up to 5 miles from their roosting site (NHESP 2015). Tricolored bats spend the winter months at hibernacula sites before dispersing to summer roosting habitat in forests. During the summer tricolored bats primarily roost among live foliage and dead leaf clusters. Tricolored bats have also been known to roost in Spanish moss (*Tillandsia usneoides*), *Usnea trichodea* lichen, and squirrel nests. Hardwood trees, especially oak trees (*Quercus* spp.) are most frequently selected for roosting, but roosting has also been observed in conifer trees such as the eastern red cedar (*Juniperus virginiana*) (Thames 2020). Summer roosting locations are generally chosen in older (> 50 years) growth forests that have a hardwood component. Male Tricolor bats will roost singly, while females will roost in small maternal colonies averaging seven individual bats (Perry and Thill 2007b). Although primarily occurring in forests, roosting may also take place in anthropogenic structures such as barns, beneath porch roofs, bridges, and concrete bunkers (USFWS 2021c). Tricolored bats exhibit high site fidelity, returning year after year to the same summer roosting locations and winter hibernaculums. Winter hibernacula and summer roosting locations may be separated by great distances. Typical migrations to hibernacula in Massachusetts may be up to 137 km (NHESP 2015d), although the longest spring migration observed was 151 miles (243 kilometers) from a cave in southern Tennessee to a roost in Georgia (Samoray et al. 2019). During the winter, tricolored bats hibernate in caves and mines; although, in the southern United States, where caves are sparse, tricolored bats often hibernate in road-associated culverts, as well as sometimes in tree cavities and abandoned water wells. There are four known hibernacula in Massachusetts, and one in Rhode Island (USFWS 2021c). Tricolored bats are the first species to enter hibernation in the fall and the last to leave the hibernacula in the spring. Breeding occurs in the fall when the bats swarm around the entrances of their winter hibernacula. Females typically give birth to two young in June or July the following summer. Young bats will begin flying at less than 3 weeks of age (NHESP 2015d).

4.3.2 Tricolored bat in the Action Area

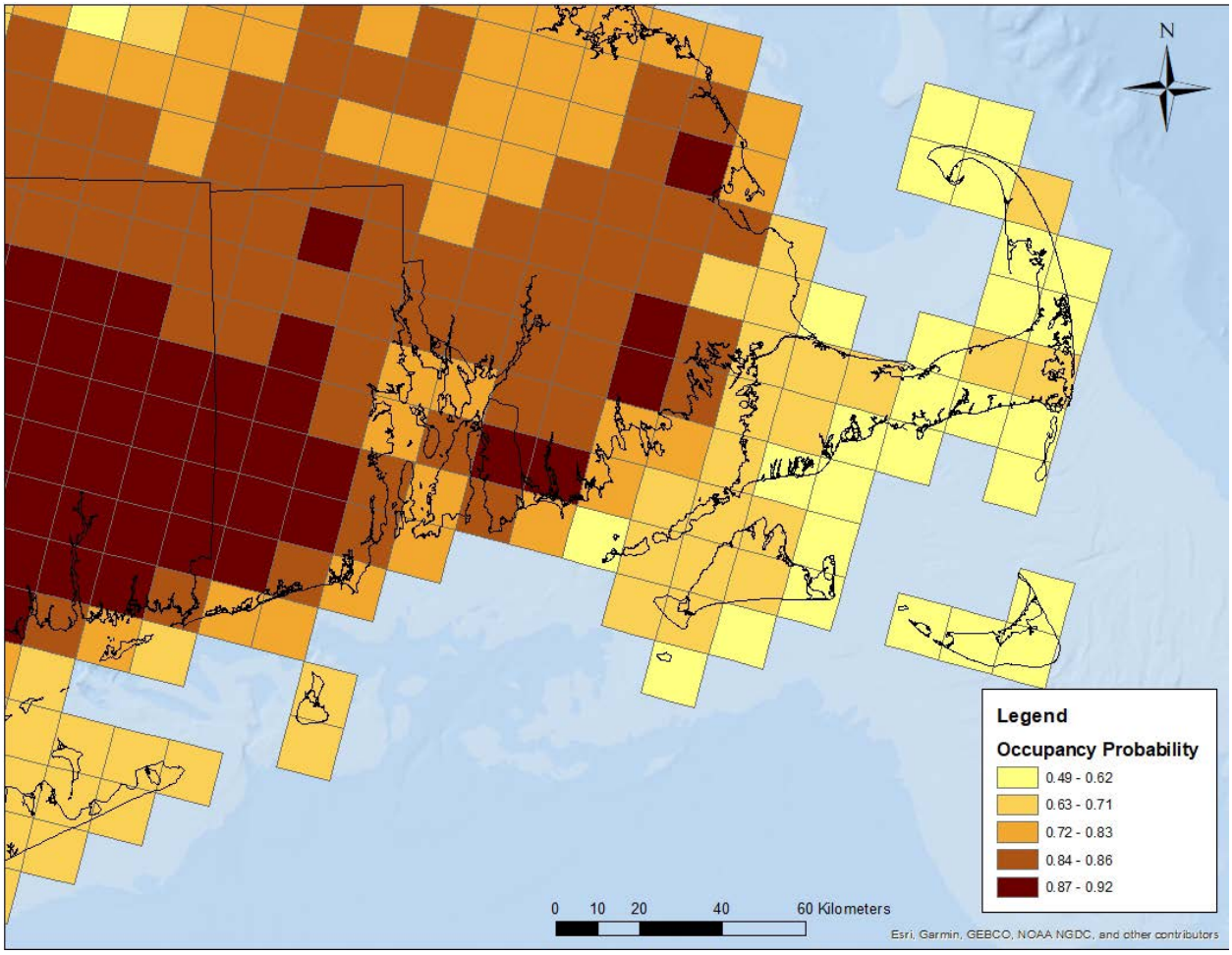
As is the case with the northern long-eared bat, the tricolored bat is not expected to be found offshore or on the OCS (Pelletier et al. 2013; ESS Group, Inc. 2014; Hatch et al. 2013; Sjollema et al. 2014; Smith and McWilliams 2016; Dowling et al. 2017). An acoustic survey of bat activity on islands 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. Acoustic studies on Martha's Vineyard provide evidence of tricolored bats flying along the coast, and potentially crossing open water to reach the mainland (Pelletier et al. 2013). However, as these bats are not latitudinal migrators, these 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 Lease Area.

The Falmouth onshore Action Area and the Aquidneck Island onshore Action Area are within the population range of the tricolored bat. Estimations of 2019 summer occupancy probabilities by the USGS North American Bat Monitoring Program place Massachusetts and Rhode Island with a moderate probability of summer occupancy. Massachusetts as a whole was estimated to have a 45.2 percent probability of summer occupancy. Insufficient data were collected from Rhode Island to estimate occupancy probability across the state. Hotspots of occupancy probability lie within the Appalachian Mountains and the lower Mississippi River delta (USGS 2019). A separate USGS analysis analyzing summer occupancy probability from 2010 to 2019 (Udell et al. 2022) estimated an 82 percent probability of occupancy in the 6.2-mile-by-6.2-mile (10.0-kilometer-by-10.0-kilometer) grid cell containing the Brayton Point Action Area. The grid cell containing the Aquidneck Island was found to have an 83 percent probability of occupancy. The Falmouth Action Area is split between two grid cells, with the western cell having an occupancy probability of 66 percent, and the eastern cell having an occupancy probability of 62 percent (Figure 14) There are no known tricolor bat hibernacula occurring in the Action Areas. The nearest known hibernacula in Massachusetts occur in western Massachusetts, in the Berkshire, Franklin, and Hampden counties (NHESP 2015d).

The habitat of the Falmouth onshore Action Area is depicted in Figure 7. The landscape around the Action Area is classified as a Pine Barren (84) level III ecoregion by USEPA and as Cape Cod Coastal Lowlands and Islands Ecoregion by the MA DFW. Forests in this area are composed of primarily pitch pine (*Pinus rigida*) and notably, scrub oak (*Quercus ilicifolia*). The presence of oaks, the tree preferred by tricolored bats for summer roosting, indicates that these forests are potential habitat for tricolored bats. Mist netting bat surveys at Camp Edwards Joint Base Cape Cod confirms the presence of tricolored bats in Cape Cod forests (MARNG 2009). The USGS GAP Analysis has identified the majority of the Falmouth onshore Action Area as year-round potential habitat for the tricolored bat (Figure 15). Despite the possibility of tricolored bats in the surrounding forests, the actual landfall and subsequent construction would occur within previously disturbed or paved surfaces, thus, resulting in minimal, if any, effects on vegetation.

Aquidneck Island is classified by the USEPA as a Narragansett-Bristol Lowland region and vegetation varies with oak-pine forests and oak-hickory due to coastal influences. For a list of all natural communities in the Brayton Point onshore Action Area, see Figure 9. The onshore Aquidneck Island routes are expected to run through developed areas or through coastal estuarine wetlands. While the western side of the export cable falls within the USGS GAP identified potential habitat (Figure 16), the Action Area is not expected to harbor significant tricolored bat populations. In response to an information request, the Rhode Island Natural Heritage Program did not identify the tricolored bat as present in the Rhode Island portions of the Brayton Point export cable corridor (USFWS, P. Jordan, personal communication [two separate letters: one regarding Sakonnet River and Mount Hope Bay, the other Lower Narragansett], June 23, 2021). The probability of summer occupancy calculated by Udell et al. 2022 gives these areas a higher probability of occupancy due to the undeveloped parts of their respective grid cells. The surrounding natural community contains forests of oak-hickory and oak-pine, which are preferred roosting habitat. However, because the landfall areas and export cable corridor areas are not heavily forested, tricolored bat habitat is precluded from the area. Therefore, tricolored bat presence is not expected within the Aquidneck Island cable routes.

The landscape around the Brayton Point onshore Action Area is mainly an existing industrial area. However, the natural environment is classified as a Northeastern Coastal Zone (59) level III ecoregion by USEPA and classified by MA DFW as a Narragansett-Bristol Lowland Island Ecoregion. The USGS GAP analysis has identified the surrounding area as potential year-round tricolored bat habitat (Figure 17). Because the majority of the Action Area is already developed and lacks vegetation, tricolored bat presence is not expected to occur in the Brayton Point onshore Action Area.



Source: Calculated by USGS (Udell et al. 2022)

Figure 14. Tricolored bat (*Perimyotis subflavus*) summer occupancy probability in Southern Massachusetts and Rhode Island within NaBat grid cells

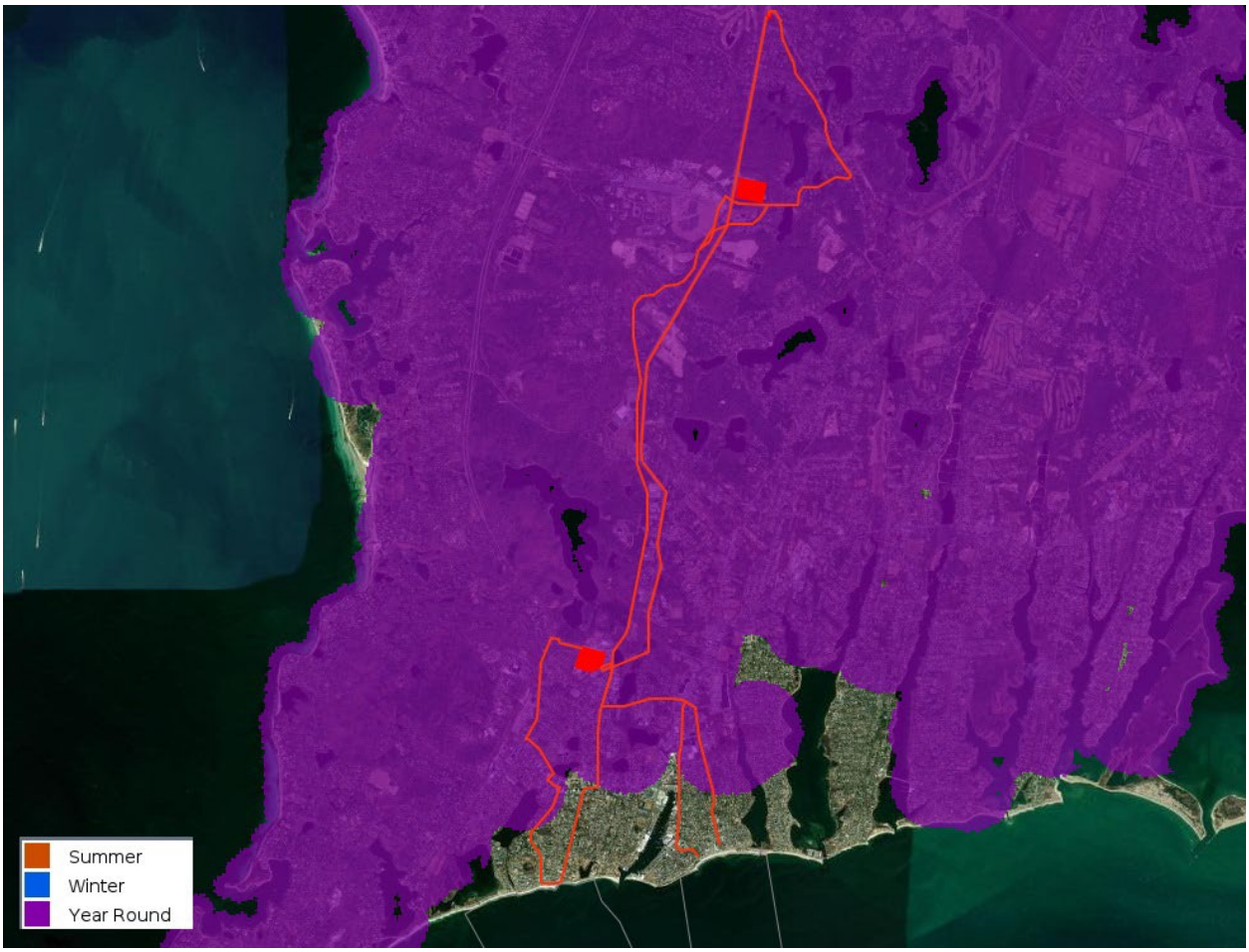


Figure 15. USGS GAP analysis tricolored bat predicted habitat range for Project onshore facilities in Falmouth

Figure 16. USGS GAP analysis tricolored bat predicted habitat range for Project onshore facilities in Aquidneck Island

Figure 17. USGS GAP analysis tricolored bat predicted habitat range for Project onshore facilities in Brayton Point

4.4 Piping Plover

4.4.1 Species Description

The piping plover is a small, migratory shorebird that breeds along the Atlantic coast, the Great Lakes, and the Great Plains regions of the United States and winters in coastal habitats of the southeastern United States, coastal Gulf of Mexico, and the Caribbean (Elliott-Smith and Haig 2004; USFWS 1996, 2009). USFWS listed the Atlantic coast breeding population as threatened in 1985 (50 *Federal Register* 50726). Additionally, the piping plover is listed as Threatened under the Massachusetts ESA (Mass Wildlife 2020) and as a Species of Greatest Conservation Need in Rhode Island (RIDEM 2015). Critical habitat for wintering piping plovers has been designated along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas (66 *Federal Register* 36038). Only the Atlantic coast population has the potential to occur in the Action Area during the breeding season, as well as during spring and fall migration. According to USFWS, piping plovers which breed on the Atlantic coast belong to the *melodus* subspecies. 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). Predation is also an issue and is associated with human-related disturbance in the Commonwealth of Massachusetts (BOEM 2013; USFWS 2009; Elliott-Smith and Haig 2004). Despite these population pressures, there is

little risk of near-term extinction of the Atlantic coast population of piping plovers (Plissner and Haig 2000), and since that prediction, the Atlantic coast population has been steadily growing. In fact, 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 2022b, 2020a). According to the *USFWS 2019 Atlantic Coast Piping Plover Abundance and Productivity Estimates*, there were 743 breeding pairs recorded in Massachusetts with 1.5 chicks fledged per pair. Massachusetts currently contains one of the largest breeding populations of piping plovers along the Atlantic coast and during the 2021 breeding season, the population increased 21.7 percent relative to 2020 (NHESP and MA DFW 2022). Based on USFWS data, the Massachusetts population of piping plovers has increased 354 percent from a low of 213 breeding pairs in 1992 to 967 breeding pairs in 2021 (USFWS 2022b). 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).

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 in proximity to the Action Area 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. 2020). 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).

Piping plover breeding in Rhode Island is concentrated primarily on sandy beaches along the state's southern coast. The highest nesting population of piping plovers in Rhode Island occurs at the Trustom Pond National Wildlife Refuge, accounting for 31 percent of nesting pairs monitored by USFWS staff in Rhode Island in 2018 (Loring et al. 2019, 2020). Inland shorelines within Narraganset Bay (i.e., near the sea-to-shore transition) are generally not considered to be suitable nesting habitat for piping plovers, although one pair does nest in a restricted area of the Quonset Airport, adjacent to the sea-to-shore transition (Loring pers. comm. 2022 as cited in BOEM 2022b). Within Massachusetts, the nesting population of piping plovers is spread throughout the state but focused on Cape Cod. A 2021 census of breeding pairs in Massachusetts found 48 percent of pairs nested on Cape Cod beaches. The most productive breeding site was located on Crane Beach, Ipswich, which hosted 54 breeding pairs. Other important breeding sites were Parker River National Wildlife Refuge in Newburyport, Sandy Neck Beach in Barnstable, and the Monomoy Island National Wildlife Refuge (NHESP and MA DFW 2022).

While the precise migratory pathways along the Atlantic coast and to the Bahamas are not well known (USFWS 2009; Normandeau Associates, Inc. 2011), both spring and fall migration routes are believed to follow a narrow strip along the Atlantic coast but may extent up to 124 miles (200 kilometers) offshore (Loring et al. 2020). 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. 2020). Due to the difficulty in detecting piping plovers in the offshore environment during migration, because of the assumed nocturnal and high-elevation migratory flights, there are no definitive observations of this species in offshore environments greater than 3.0 miles (4.8 kilometers) from the Atlantic coast (Normandeau Associates, Inc. 2011).

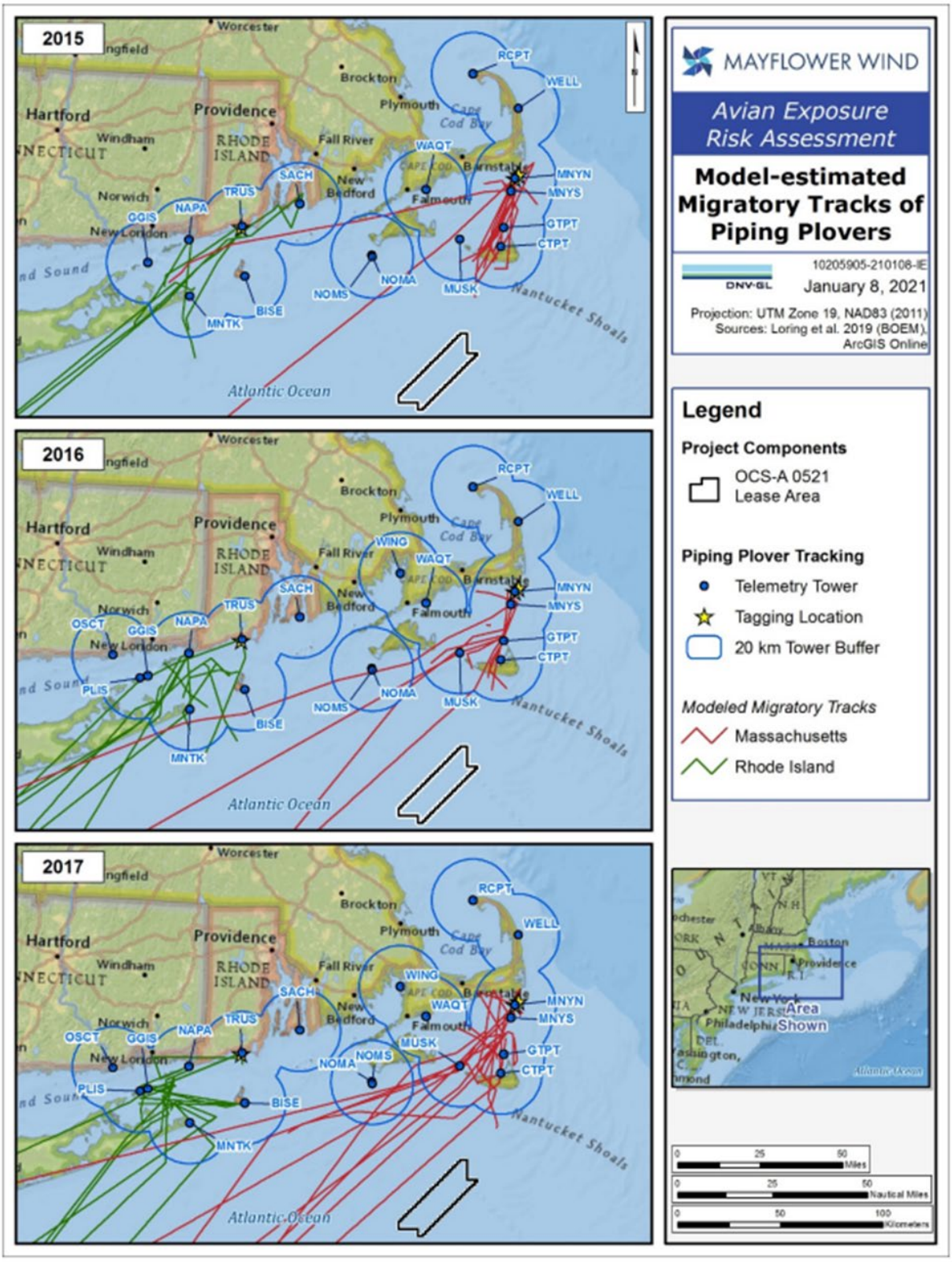
4.4.2 Piping Plover in the Action Area

Piping plovers are present in Massachusetts during their breeding season and spring and fall migratory seasons which occur from late March through mid-October (Robinson Willmott et al. 2013; Normandeau Associates, Inc., 2011). A recent Very High Frequency (VFH)-tracking study documented the movement of piping plovers in Rhode Island and Massachusetts and found that most piping plovers fly close to and parallel to the coast with a favorable atmospheric condition and all individuals tracked during the migratory departure exhibited a south–southwest trajectory (Loring et al. 2019). Piping plovers were tagged from breeding populations in Monomy National Wildlife Refuge, South Beach, and the southern coast of Rhode Island (Loring et al. 2019). Twenty percent of piping plovers flew at wind speeds <=4m/sec (Loring et al. 2019), which is below the cut in speed for an offshore wind turbine. The study indicated that piping plovers which departed breeding grounds in Massachusetts and Rhode Island primarily utilized offshore routes during initial migration to sites in the mid-Atlantic (Loring et al. 2019).

Piping plovers were not observed at the local scale during Massachusetts Clean Energy Center (MCEC) surveys, Aerial High Definition (HD) surveys, or Geophysical and Geotechnical (G&G) surveys. In addition, none of the Massachusetts or Rhode Island breeding plovers flew over the Mayflower Wind Lease Area during fall migration. However, some piping plover individuals from Monomoy Island, Muskeget Island, and Nantucket Island moved southward and the individuals may have traversed over the Mayflower Wind Lease Area before they moved beyond the detection range of trackers (Figure 18), and the estimated probability of piping plover exposure in the Lease Area based on these is low (Loring et al. 2019) (Figure 19).

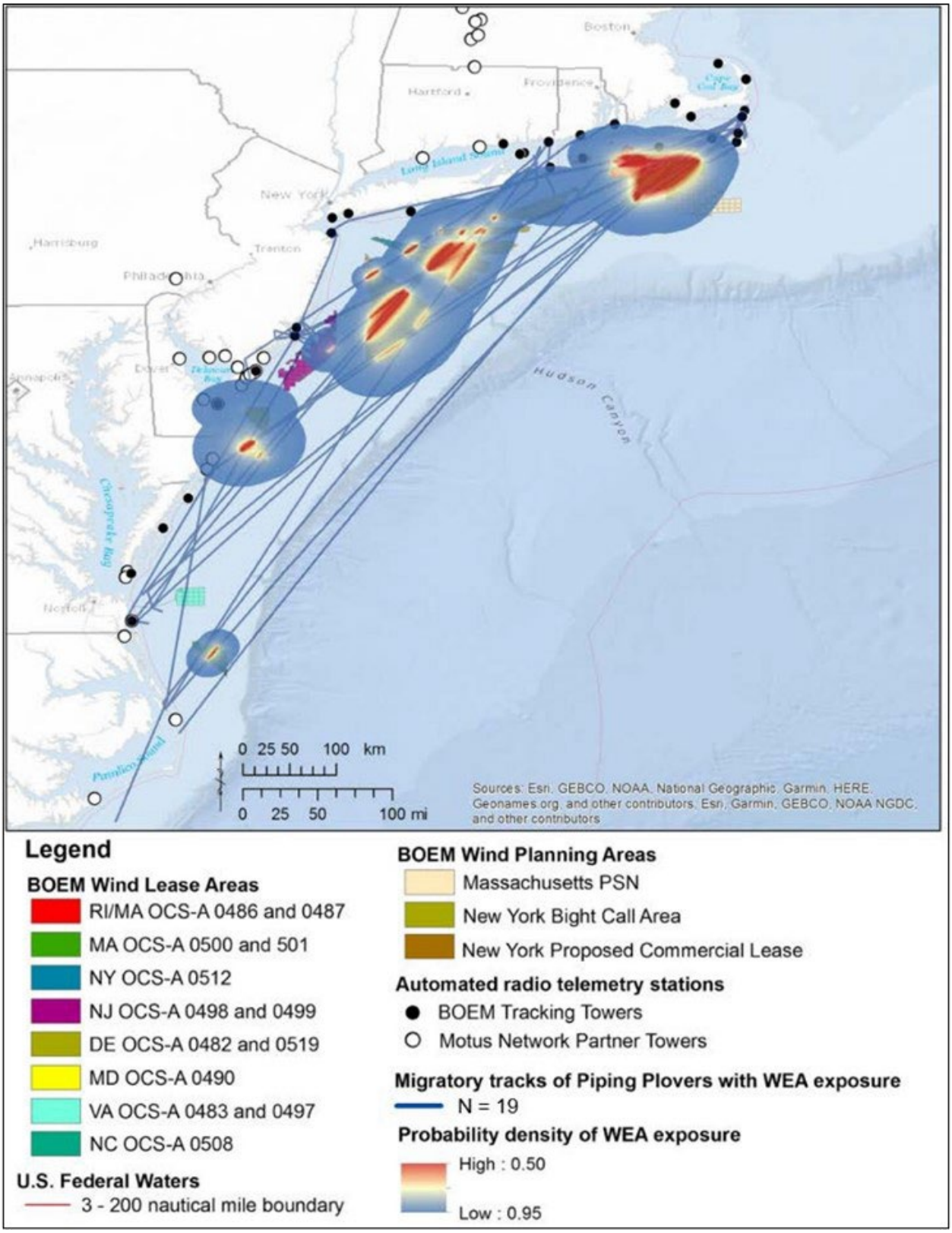
Migration occurs primarily during evenings, with the average takeoff time appearing to be around 5:00 to 6:00 p.m. (Loring et al. 2017, 2019). Loring et al. (2019) also used telemetry data to estimate migratory flight altitudes over federal OCS waters (i.e., >3 miles offshore). Most migratory flights were above typical turbine heights with 84.8 percent of the piping plover flights above the rotor-swept zone (RSZ) (Loring et al. 2019; Figure 20). The flight altitude estimates were interpolated values from land-based stations were above the RSZ (estimated for analysis as between 82 and 820 feet (25 and 250 meters) above mean sea level (MSL). The mean flight altitude over federal waters was 942 feet (287 meters), with a 5th to 95th percentile range of 157 to 1,237 feet (48 meters to 377 meters).

During the spring migration, a pilot study was conducted where 10 plovers were fitted with transmitters in the Bahamas; only two plovers that had enough data for analysis traveled north along the Atlantic coast. The migration period lasted for a period of several weeks, during which the two birds stayed close to shore and were not detected north of Montauk, New York (Appendix I in Loring et al. 2019). The flight paths of 19 piping plovers during fall migration. Although some plovers were estimated to fly over the Rhode Island/Massachusetts WEA, none flew over the Lease Area (OCS-A 0521; Loring et al. 2019; Figure 18). Although it is possible for piping plovers to cross the Lease Area, relatively few are likely to do so. Those that do would likely be flying above the turbine height (Figure 20), and thus most will not likely encounter turbines.



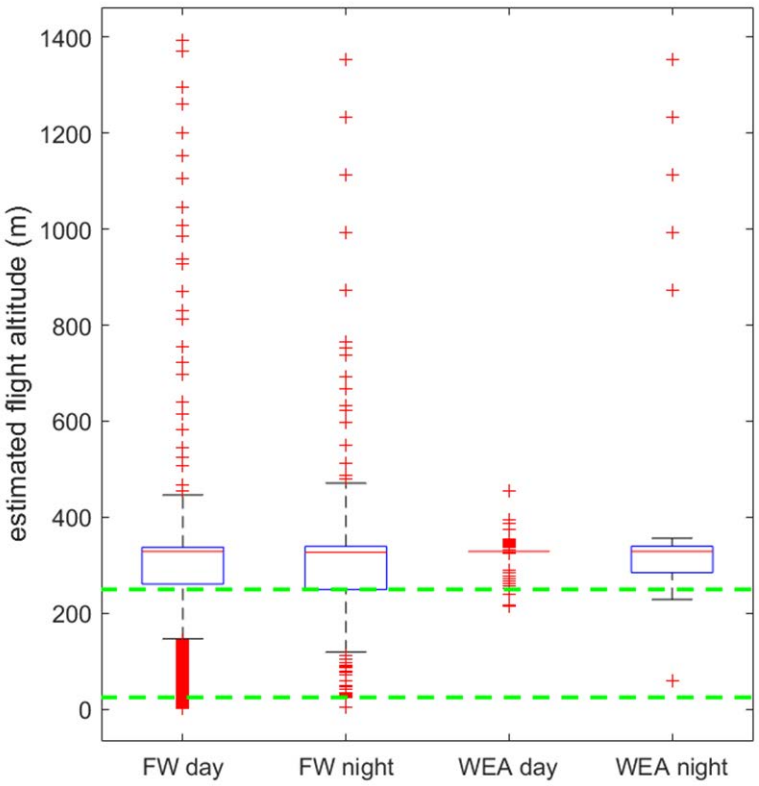
Source: Loring et al. 2019

Figure 18. Estimated flight paths of piping plovers



Source: Loring et al. 2019

Figure 19. Probability density of WEA exposure for piping plovers



Note: The green-dashed lines represent the lower and upper limits of the RSZ (25–250 meters).
Source: Loring et al. 2019

Figure 20. Model-estimates flight altitude ranges (m) of piping plovers during exposure to federal waters (FW) and WEAs during day and night

Piping plovers have reported sightings within the vicinity of the onshore Action Areas including Falmouth Heights, Surf Drive parking lot, Seapowet Marsh, Fogland Beach, and Sachuset Point National Wildlife Refuge (eBird 2023). The summary of the 2021 Massachusetts Piping Plover Census recently documented breeding piping plovers at 188 sites with a distribution of breeding pairs located in Buzzards Bay, Upper Cape, South Shore, North Shore, Nantucket, Martha's Vineyard, and the Lower Cape (NHESP and MA DFW 2022). In this summary, one pair of piping plovers was recorded at Surf Drive in Falmouth, which is in the vicinity of the Shore Street landfall site under consideration for the Proposed Action.

As stated above in Section 4.2.2, information was requested from the Massachusetts NHESP regarding state-listed species, which may potentially be present in habitats traversed by the Action Areas in Falmouth. PHs 2158/176/and 887 were found to contain records for the piping plover (E. Holt, personal communication). As started above in Section 4.2.2, Mayflower Wind requested information from RIDEM regarding state listed species that may be present in areas in the vicinity of the Brayton Point onshore Action Area. In response to that request, the RIDEM identified piping plovers as known or potentially occurring within the Brayton Point onshore Action Area (Mayflower Wind COP Volume 2, Appendix J, Table 4-10; Mayflower Wind 2022). BOEM additionally reviewed the USGS GAP habitat data, which did identify the piping plover as occurring or potentially occurring in the Action Area covering the onshore Project elements and portions of the offshore ECCs (Figure 21, Figure 22, and Figure 23). Overall, based on eBird sightings and consultation with NHESP and RIDEM, it is possible that foraging and/or nesting piping plover occurrence is possible at or near the landfall sites in Falmouth, and the Brayton Point onshore Action Area.

Figure 21. USGS GAP analysis piping plover predicted habitat range for Project onshore facilities in Falmouth

Figure 22. USGS GAP analysis piping plover predicted habitat range for Project onshore facilities in Aquidneck Island

Figure 23. USGS GAP analysis piping plover predicted habitat range for Project onshore facilities in Brayton Point

4.5 *Rufa* Red Knot

4.5.1 Species Description

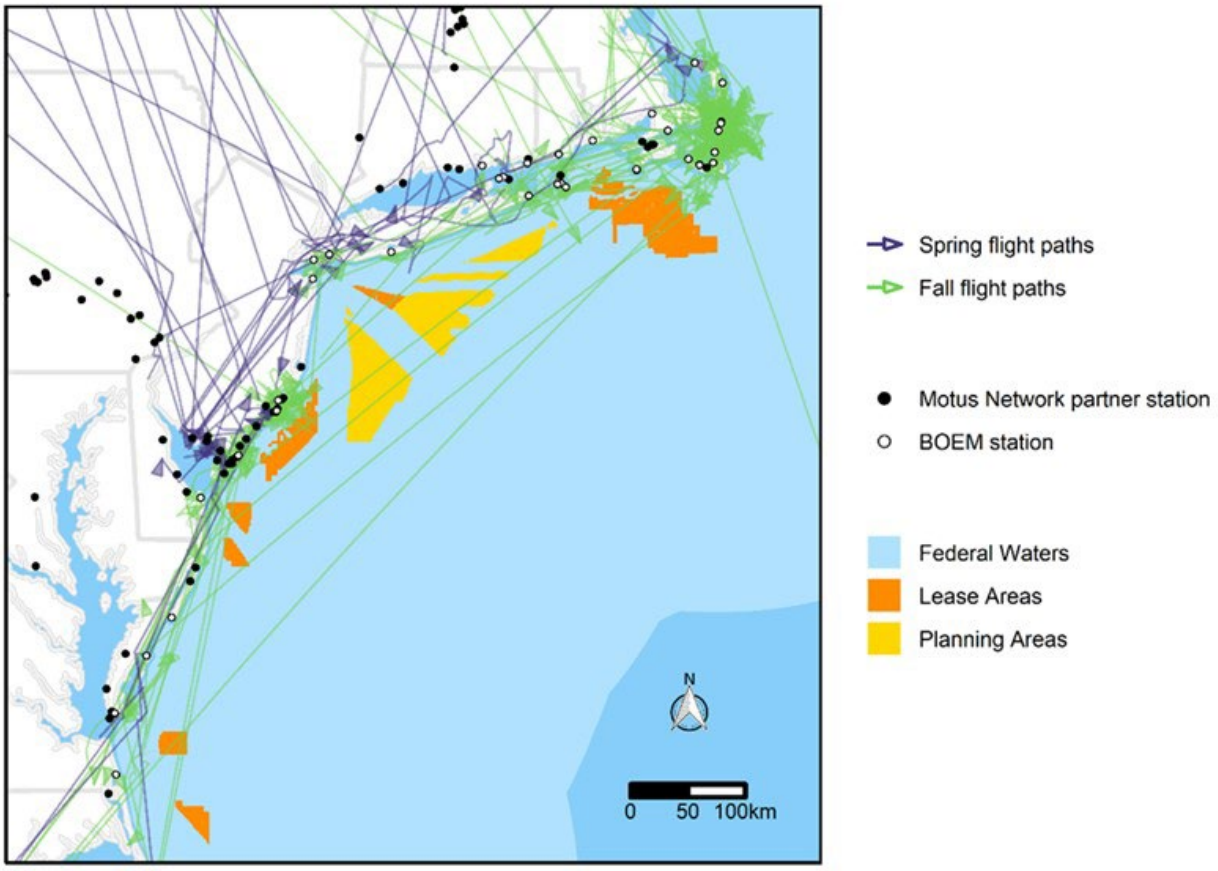
The *rufa* red knot is a medium-sized member of the sandpiper family that breeds in the Canadian Arctic and winters along the northwest coast of the Gulf of Mexico, along the Atlantic coast from Florida to North Carolina, and along the Atlantic coasts of Argentina and Chile (USFWS 2014). Over the last 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). Due to observed population declines, USFWS listed the *rufa* red knot as threatened under the ESA in 2014 (79 *Federal Register* 73706). USFWS proposed critical habitat for the *rufa* red knot in 2021 (86 *Federal Register* 37410), but not in the Action Area. Additionally, the red knot is listed as Threatened under the Massachusetts ESA (Mass Wildlife 2020) and listed as a Species of Greatest Conservation Need in Rhode Island (RIDEM 2015). 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).

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). 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 and Rhode Island 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). The red knot is also known to stop over on Monomoy Island during the fall migration period (Baker et al. 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. The 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).

There are no observation records of *rufa* red knots near the Lease Area (USFWS 2018b). 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, including Massachusetts (Burger et al. 2012a and 2012b; Niles et al. 2010; Normandeau 2011).



Loring et al. 2020

Figure 24. Modeled flight paths of *rufa* red knot during spring migration (n = 31) and fall migration (n= 146) in 2014 to 2017

4.5.2 *Rufa* Red Knot in the Action Area

The *rufa* red knot is known to pass through coastal habitats along Rhode Island and Massachusetts during the spring and fall migration, with a greater number of individuals passing through during the fall (BOEM 2013). 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 different 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/meters^2) 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.

Only a small portion of *rufa* population uses the Atlantic coast during the southward migration (Loring et al. 2018). A recent study that tracked 388 red knots fitted with nanotags found that no individuals flew over the Massachusetts Wind Energy Area during fall migration in November (Loring et al. 2018). Most of the knots (254) were tagged at stop over sites in James Bay and Mingan Islands Canada, and most headed directly south over open ocean (Loring et al. 2018). Of the 99 *rufa* red knots tagged while staging in Massachusetts before the fall migration, only two knots flew over MA OCS-A 0501 (Loring et al. 2018). Most *rufa* red knots departed from Massachusetts to the southeast during from mid-August through early September. In spring, the vast majority of *rufa* red knots fly directly overland from stopover areas in Delaware Bay to breeding areas in Hudson Bay Canada. However, some *rufa* red knots do travel up the coast in spring as confirmed by a tracking study (Loring et al. 2018). Ten percent of the fall staging population (150 knots) may pass through the Nantucket area in spring (Gordon and Nations 2016). The results from Loring et al. (2018) overall indicate that most individuals followed a coastal migratory route and probability to exposure in the lease area is low.

Contrary to previous assumptions (Gordon and Nations 2016), fall migration flights occurred when visibility was 12.4 miles (~20 kilometers) with little or no precipitation (Loring et al. 2018). *Rufa* red knots migrate at high altitudes from 1,640 to 3,281 feet (500 to 1,000 meters) (Alterstam et al. 1990; Gordon and Nations 2016), well above the proposed RSZ (54 to 1,066.4 feet [16.5 to 325 meters]) above Mean Lower Low Water; COP Volume 1). In contrast to these observations, a study that estimated flights heights from telemetry data found that 83 percent of the 25 modeled flight paths occurred much lower and within 20-200 meters above water (Loring et al. 2018). Yet, the confidence intervals around the estimated flight heights were very broad, and in several cases spanning from near the ocean surface to over 1,000 meters (Loring et al. 2018). However, a recent study by Loring et al. (2020) found that during non-stop flights over federal waters, estimated flight heights based on telemetry data varied greatly (28 to 2,940 meters). Overall, exposure to the RSZ during the fall was higher (36 percent of offshore flights in RSZ), compared to spring (24 percent of offshore flights in RSZ). The overall mean flight altitudes during spring and fall were 914 meters, and 545 meters, respectively, which are well above the proposed RSZ for Mayflower Wind. A more recent telemetry studies using global positioning satellite (GPS) satellite tags yielded more precise results and found that none of the fall migrating red knots traveled within the RSZ, but instead mostly flew below the RSZ and one flew above the RSZ (BRI and Wildlife Restoration Partnerships 2022; Feigin et al. 2022). Therefore, the flight height data suggest that it is unlikely that migrating *rufa* red knots would collide with operating WTGs based on how high *rufa* red knots fly with respect to the Projects' spinning turbine blades.

Additionally, the *rufa* red knot was not observed at the local scale during MCEC surveys, Aerial HD surveys, or G&G surveys and predicted abundance was not modeled by MDAT. Nevertheless, very little, if any, *rufa* red knot activity is expected over the Massachusetts WEA, with relatively few flying through the Wind Farm Area during the spring and fall migration. Due to the variation in seasonal migration behavior, this may affect the potential population that would cross the Wind Farm Area and provides support that fewer *rufa* red knots may traverse this area during spring migration as individuals choose overland direct flights from the mid-Atlantic to breeding grounds, as opposed to following the coastline. With 2,000 to 5,000 individuals staging in Massachusetts during the fall, a larger number of *rufa* red knots may pass through the Wind Farm Area in the fall rather than the spring.

The *rufa* red knot has reported sightings within the vicinity of the onshore Action Area at Sachuest Point National Wildlife Refuge (eBird 2023). As stated above in Section 4.2.2, information was requested from the Massachusetts NHESP regarding state-listed species, which may potentially be present in habitats traversed by the Action Areas in Falmouth. No PHs were found to contain records for the *rufa* red knot (E. Holt, personal communication). As started above in Section 4.2.2, Mayflower Wind requested information from RIDEM regarding state listed species that may be present in areas in the vicinity of the Brayton Point onshore Action Area. In response to that request, the RIDEM did not identify *rufa* red knots as known or potentially occurring within the Brayton Point onshore Action Area (COP Volume 2, Appendix J, Table 4-10; Mayflower Wind 2022).

BOEM additionally reviewed the USGS GAP habitat data, which did identify the *rufa* red knot as occurring or potentially occurring in the Action Area covering the onshore Project elements and portions of the offshore ECCs (Figure 25, Figure 26, and Figure 27). Overall, it is possible that during the spring and fall migration periods, *rufa* red knots may traverse onshore areas of the Falmouth and Brayton Point Action Areas.

Figure 25. USGS GAP analysis *rufa* red knot predicted habitat range for Project onshore facilities in Falmouth

Figure 26. USGS GAP analysis *rufa* red knot predicted habitat range for Project onshore facilities in Aquidneck Island

Figure 27. USGS GAP analysis *rufa* red knot predicted habitat range for Project onshore facilities in Brayton Point

4.6 Roseate Tern

4.6.1 Species Description

The roseate tern is a small colonial tern identifiable due to its long white trail-streamers, black cap and bill, and orange legs and feet (NHESP 2015b). Roseate terns have Atlantic and Caribbean discrete population segments that breed from Long Island, New York, north and east to Quebec and Nova Scotia and the eastern and western Caribbean Sea, respectively, and winter along the northeastern coast of South America (USFWS 2020b; 2010b). The northeastern roseate tern population[3] was listed under the ESA as Endangered in 1987, while terns in the Caribbean population are listed as Threatened (52 *Federal Register* 42064). No critical habitat has been designated for this species (52 *Federal Register* 42064). USFWS recently initiated a 5-year review for this species (83 *Federal Register* 39113–39115). Furthermore, the roseate tern is one among 61 species (out of 177 species on the Atlantic OCS) that ranked high in its relative vulnerability to collision with wind turbines (Robinson Willmott et al. 2013). This high ranking is partially driven by the amount of time the species spends foraging on the ocean, and if time on the ocean was restricted to migration the population would be ranked medium.

[3] This population is also known as the Northwest Atlantic population of the roseate tern and Northeast Distinct Population Segment of the roseate tern. Herewith, the population will be addressed as the Northeastern roseate tern population to distinguish the population from the Caribbean roseate tern population or the Northeastern Atlantic roseate tern population of Europe.

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. Since the USFWS 5-year review in 2010, new information has been discovered on metapopulation structure and dynamics on the distribution and behavior of roseate terns post-breeding, especially during the 3-to-4-year maturation period. It is speculated that a greater proportion of adults and non-breeding birds may return to their summer range within the northeast in North America than what was previously thought (USFWS 2020b citing J. Spendelow, personal communication 2020) and there are more 1 year old roseate terns which migrate north to their summer breeding range than previously thought (USFWS 2020b citing J. Spendelow, personal communication 2020 and I. Nisbet, personal communication 2020). Additionally, 2-year-old roseate terns, which return to their summer range may prospect at breeding colonies as well as spending time offshore or nearshore at staging areas (USFWS 2020b citing J. Spendelow, personal communication 2020 and I. Nisbet, personal communication 2020).

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). In sharp contrast to common terns, roseate terns are dietary specialists and exhibit strong fidelity to foraging sites and avoidance of clusters of other feeding tern species (Goyert 2015). In other words, roseate terns are picky feeders and do not meander around searching for food and do not follow or rely on common terns to find food. Furthermore, 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 1.9 to 6.6 inches (49 to 168 millimeters) and are chiefly found in waters shallow <7 feet (<2 meters) coastal waters and estuaries and 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 stays on the bottom during the day (Collette and Klein-MacPhee 2002). Humpback whales do consume offshore sand lance and will flush the offshore sand lance from the bottom (Hain et al. 1995).

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) from 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).

Within Massachusetts, a large number of the roseate tern population is known to stage on beaches of outer Cape Cod; however, recent research has shown members of the population from Connecticut and New York may spend a greater amount of time on the Rhode Island and New York coast than what was originally thought. USFWS 2019 5-year review of the roseate tern identified critical staging areas on outer Cape Cod, Massachusetts, and post-breeding staging areas which are consistently used by roseate terns, which includes Hatch's Harbor, Race Point and Wood End (Provincetown, Massachusetts), Jeremy Point (Wellfleet, Massachusetts), Nauset Estuary (Eastham and Orleans, Massachusetts), Monomy Islands/North and South Beach Islands (Chatham, Massachusetts), Smith's Point/Esther Island (Nantucket, Massachusetts), and Muskeget Shoals (Nantucket, Massachusetts). Smaller numbers of roseate terns that use staging areas have also been reported from additional locations in Maine, Rhode Island, New York, and Massachusetts. Cape Cod and its nearby islands (Martha's Vineyard and Nantucket) serve as important post-breeding staging areas prior to roseate tern migration (Normandeau Associates Inc. 2011). Veit et al. (2016) identified hotspots through aerial surveys of roseate tern abundance on the western side of the Nantucket Shoals and in the Muskeget Channel between Martha's Vineyard and Muskeget during the spring. Previous aerial surveys in the region indicated that from August to September, roseate tern activity occurred almost exclusively near the Muskeget Channel, with little to no activity farther offshore (Veit and Perkins 2014).

4.6.2 Roseate Terns in the Action Area

The region including the Lease Area has been intensively surveyed over the years and across seasons for marine birds which did document the presence of the roseate tern (NEFSC and SEFSC 2021; Palka et al. 2021; Paton et al. 2021; Veit et al. 2016; Veit and Perkins 2014). No roseate terns were detected during these surveys in the Lease Area or in the proposed offshore Action Area (USFWS 2018b); however, during MCEC summer surveys the roseate tern was observed in one BOEM block. Roseate Terns have also been reported offshore of southern New England in the eBird database. Sightings of roseate terns were made around Cox Ledge, an underwater feature just northeast of the Lease Area, through the years 2019-2022 (eBird 2023).

Modeling efforts based on survey data predict that roseate tern abundance is low relative to levels of abundance observed in Nantucket Sound. This prediction is based on a statistical model that used 354 roseate tern sighting from many scientific surveys throughout the Atlantic OCS during the spring, summer, and fall months (Winship et al. 2018). The modeling effort only used terns that were identified as roseate terns (terns that were not be identified as roseates were excluded from the analysis) and are based on the relationship between roseate terns and surface chlorophyll a, distance from shore, turbidity, and other factors (Winship et al. 2018). Goyert (2014) found a similar distribution pattern in a separate modeling effort that related a small subset of the roseate tern count data used by Winship and others (2018) to the amount of forage fish in spring. Therefore, it is not surprising that the predicted distribution of roseate terns (Figure 28 through Figure 30) almost mirrors the estimated spring and fall distribution of sand lance around Nantucket Sound (Figure 31).

Relative to adjacent waters, sand lance captures were very low in the Lease Area (Figure 31). Sand lance were not captured in the Lease Area or vicinity during fall and summer trawl surveys or ichthyoplankton surveys (Figure 31). Capture rates were higher in the region during spring surveys and sand lance was captured along the eastern edge of the Lease Area. Based on this information and the behavioral and foraging ecology of the roseate tern, the relatively deep and open ocean of the lease area is simply not suitable for roseate terns to routinely forage for sand lance. Of course, it is possible that roseate terns may travel from breeding or staging areas through the offshore Action Area to forage sand lance at other locations.

There has been some speculation that roseate terns may be within the Massachusetts WEA in early spring (April and May) or during post-breeding period (August through September) while they are staging. Indeed, during the Mayflower Wind's Aerial HD spring surveys, a few roseate terns were observed in three BOEM blocks (Figure 32). There also has been some speculation that during the post-breeding period roseate terns would go further offshore perhaps to forage near the offshore Action Area (despite the lack of foraging habitat). However, the surveys conducted in waters south of Tuckernuck and Muskeget Island from late August to mid-September show roseate terns forage within 10 miles of the beach (Figure 33) (Veit and Perkins 2014) and in the same areas predicted by the summer relative distribution and density MDAT models (Figures 28 through 30). Further, no roseate terns were observed in the lease area during the summer and fall Mayflower Wind's Aerial HD surveys (Figure 32).

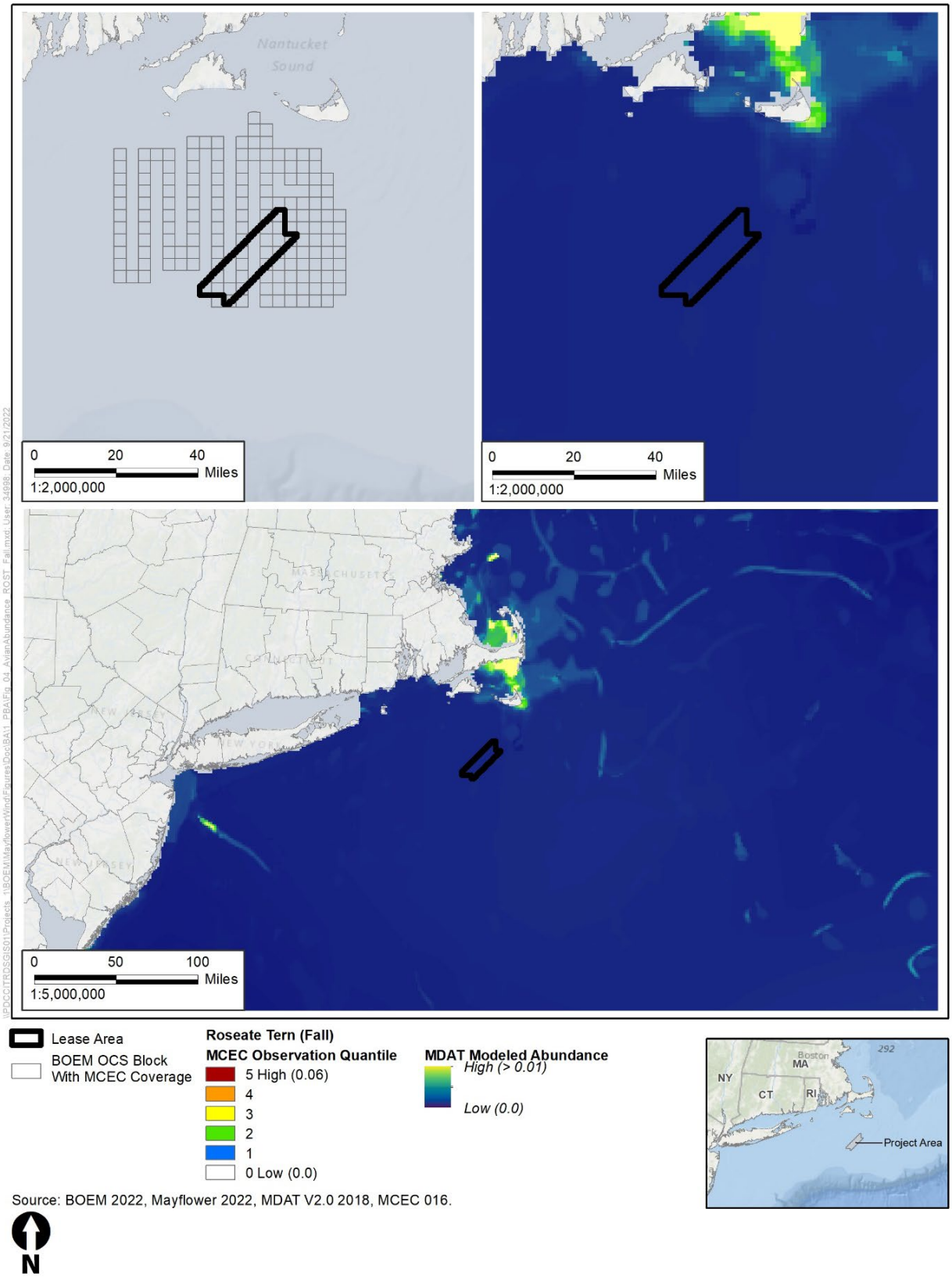


Figure 28. Fall roseate tern relative abundance

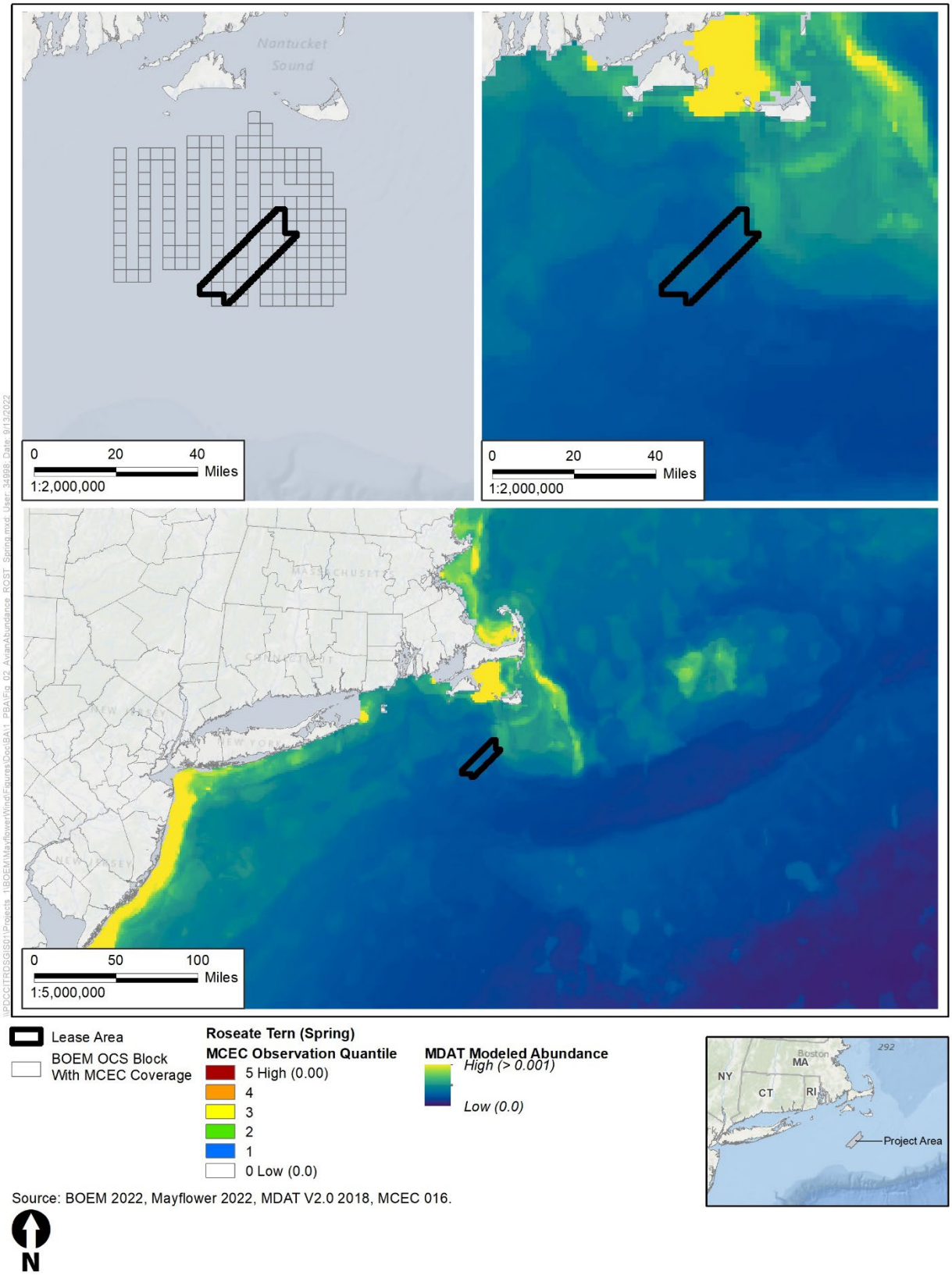


Figure 29. Spring roseate tern relative abundance

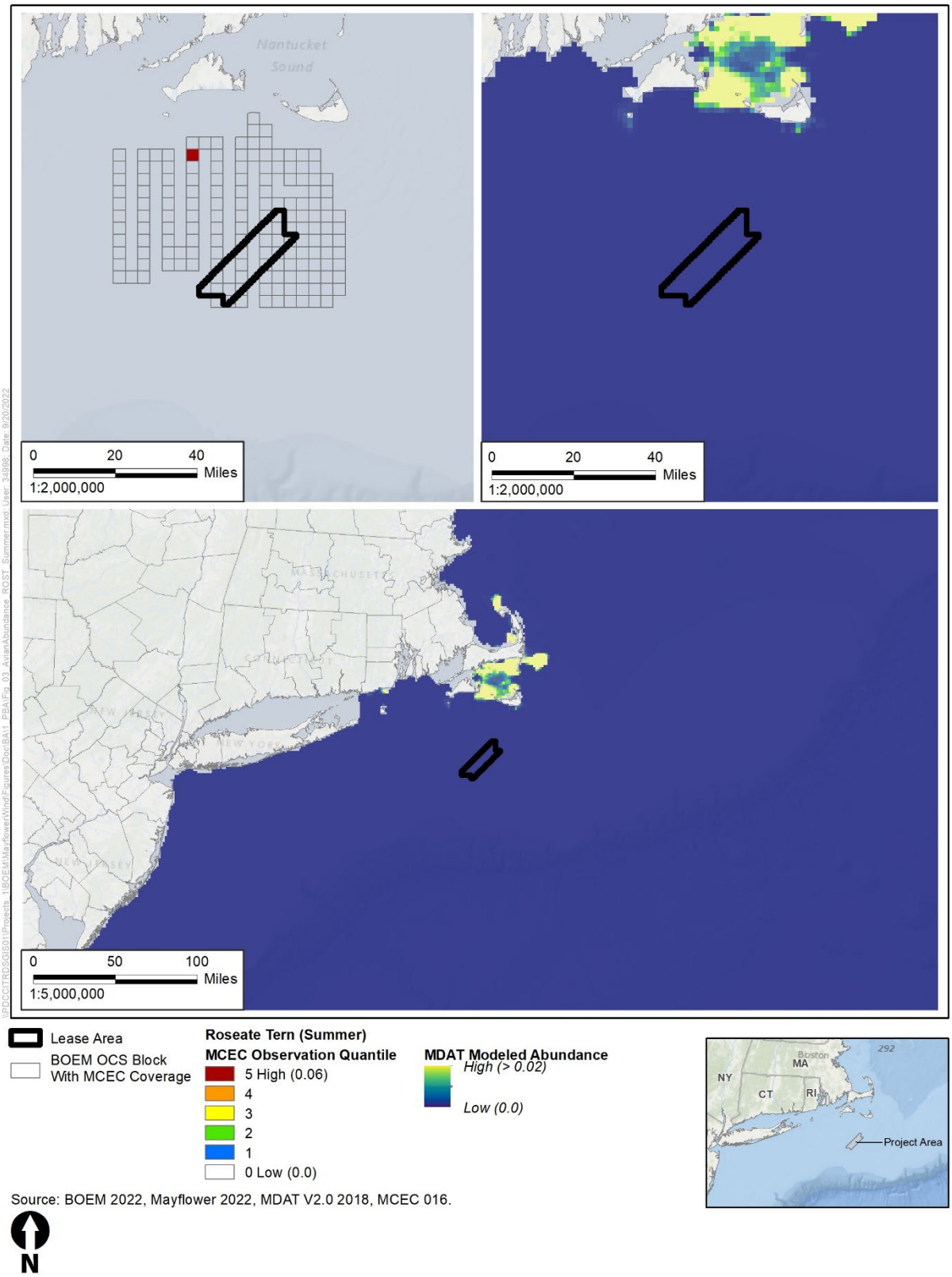
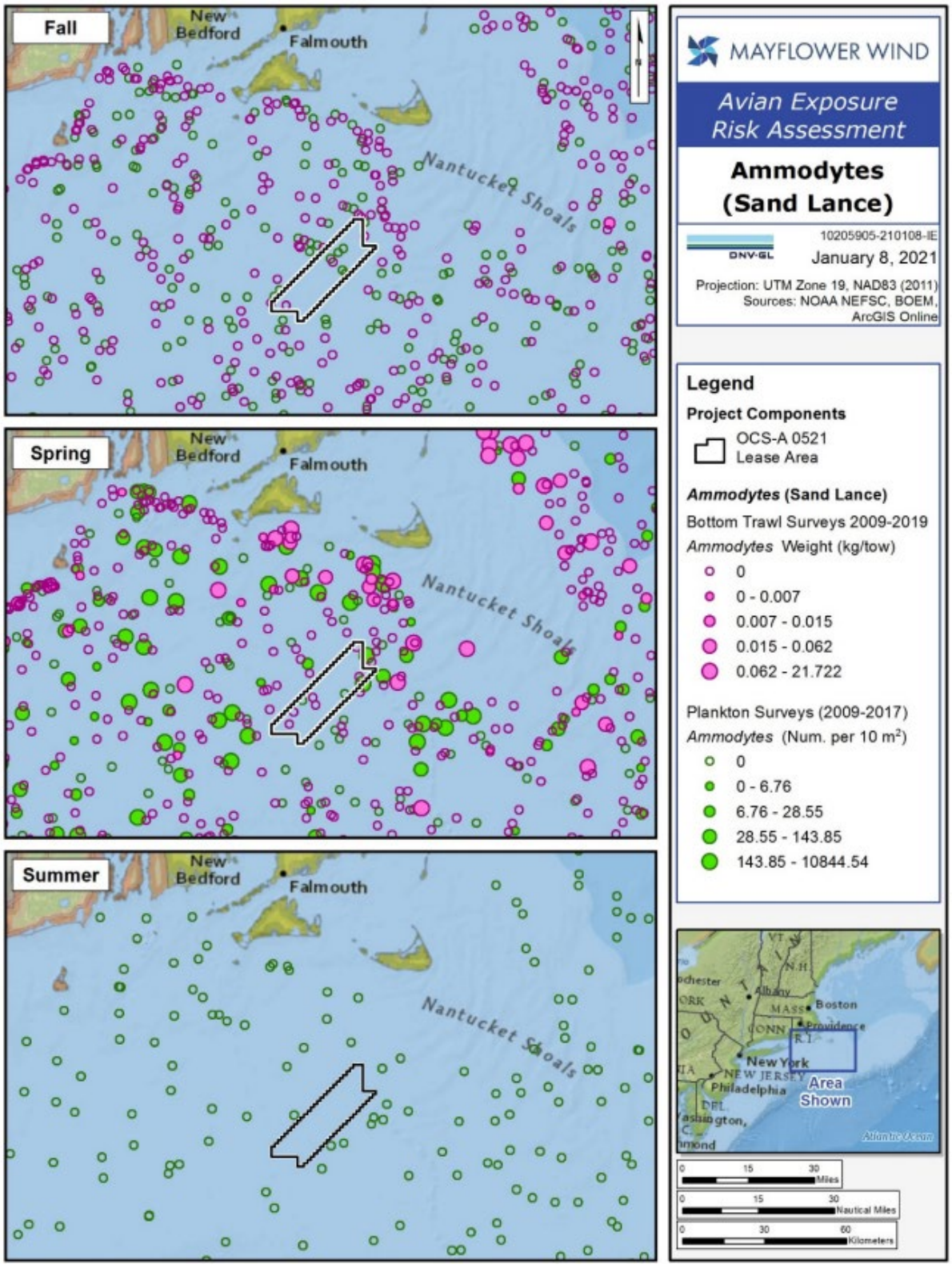


Figure 30. Summer roseate tern relative abundance



Notes: NEFSC 2020a 2020b

Figure 31. Sand lance observations recorded during bottom trawl surveys

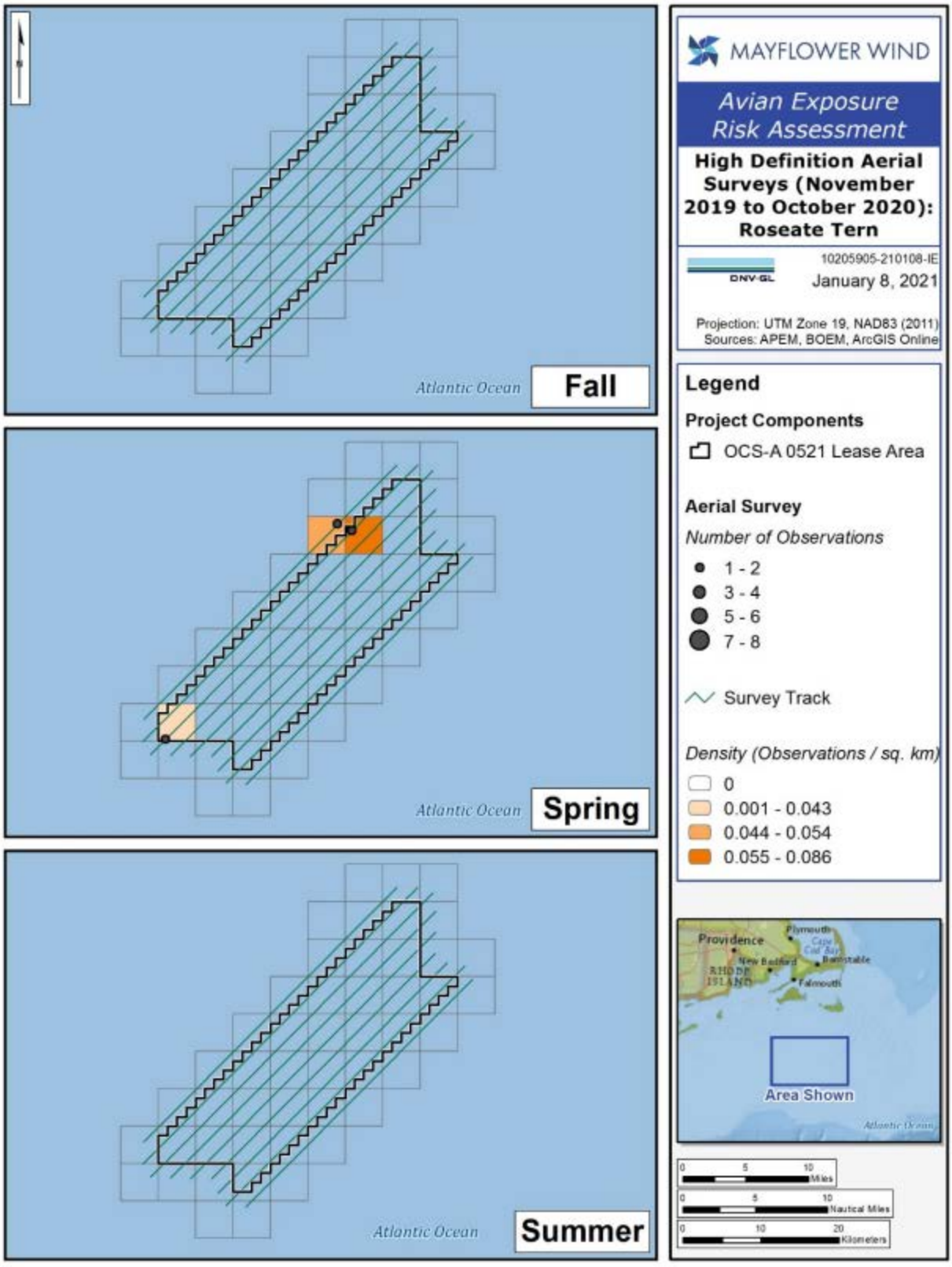
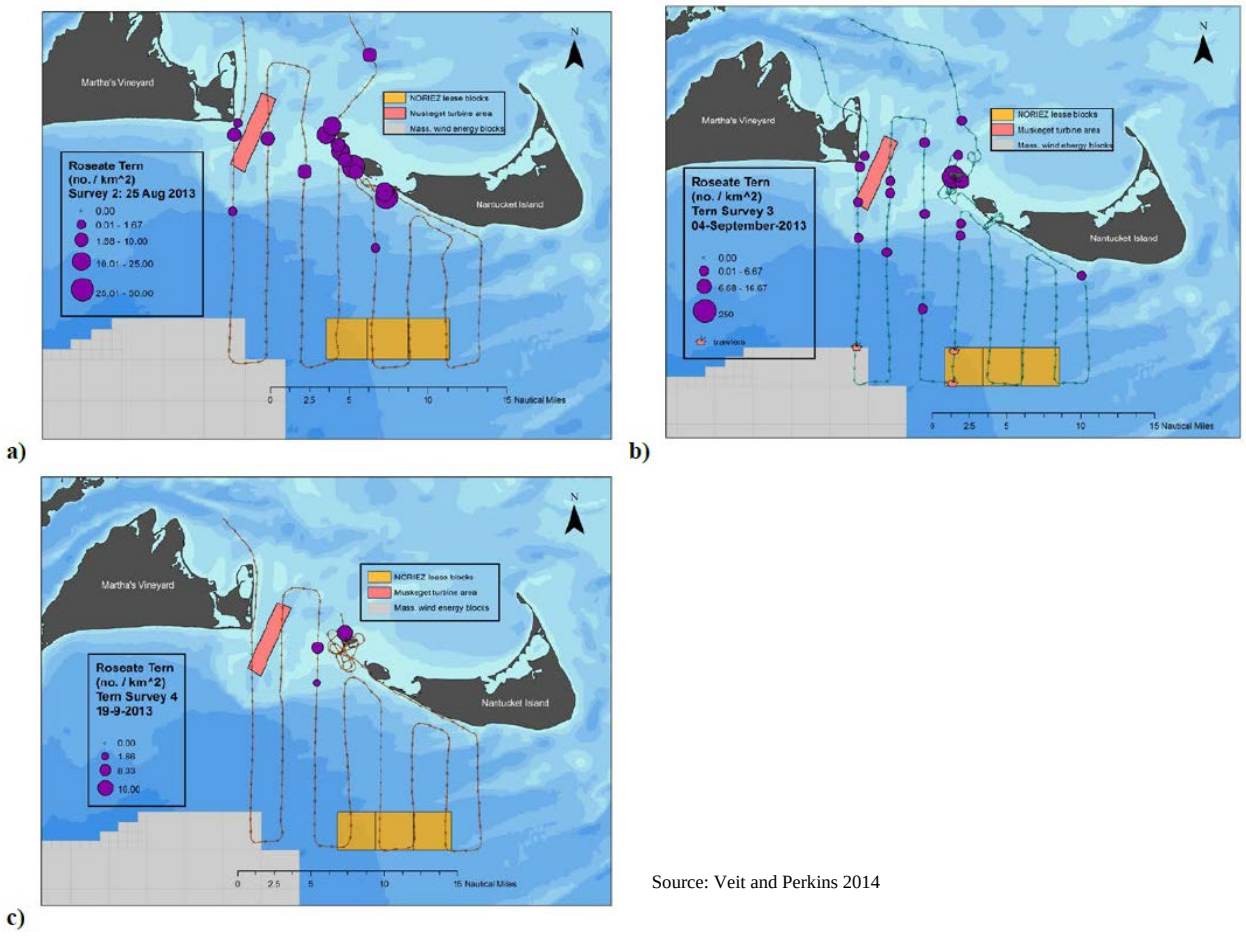


Figure 32. Raw observations and effort-adjusted seasonal density estimates for roseate tern



Source: Veit and Perkins 2014

Figure 33. Foraging roseate terns observed in aerial surveys on three dates during the post-breeding period

A recent telemetry study found that terns flew offshore when visibility was greater than 3.1 miles (5 kilometers) and departed the study area at low altitudes (Loring et al. 2019). In addition, 37.5 percent flew at wind speeds ≤ 4 m/sec (Loring et al. 2019) below the cut in speed for an offshore wind turbine. Roseate terns typically flew 36 to 66 feet (11 to 20 meters) above the water in the WEAs and flew below the RSZ near the turbines in the Block Island Wind Farm (Loring et al. 2019). Given that roseate terns migrate mainly offshore during spring and fall (Nisbet et al. 2014), it is possible that some birds pass through the Wind Development Area (WDA) during migration. However, none of the 145 modeled roseate tern flight paths crossed the Vineyard Wind lease area during breeding and non-breeding dispersal periods by the network of tracking stations (Loring et al. 2019) (Figure 4). It is possible that the roseate terns did not pass through the Lease Area as they headed south (similar to common terns [see Figure J-5 in Appendix J, Loring et al. 2019]). It is also possible that the terns were flying so low that they evaded detection. If the terns decided to fly higher, the stations would be able to detect them, because the same stations were also detecting the relatively high-flying red knots and piping plovers (Loring et al. 2018; Loring et al. 2019). Given that roseate terns were flying low as they departed the region (Loring et al. 2019), it is most likely roseate terns continued to fly low as they headed further out to sea even if they flew through the Lease Area.

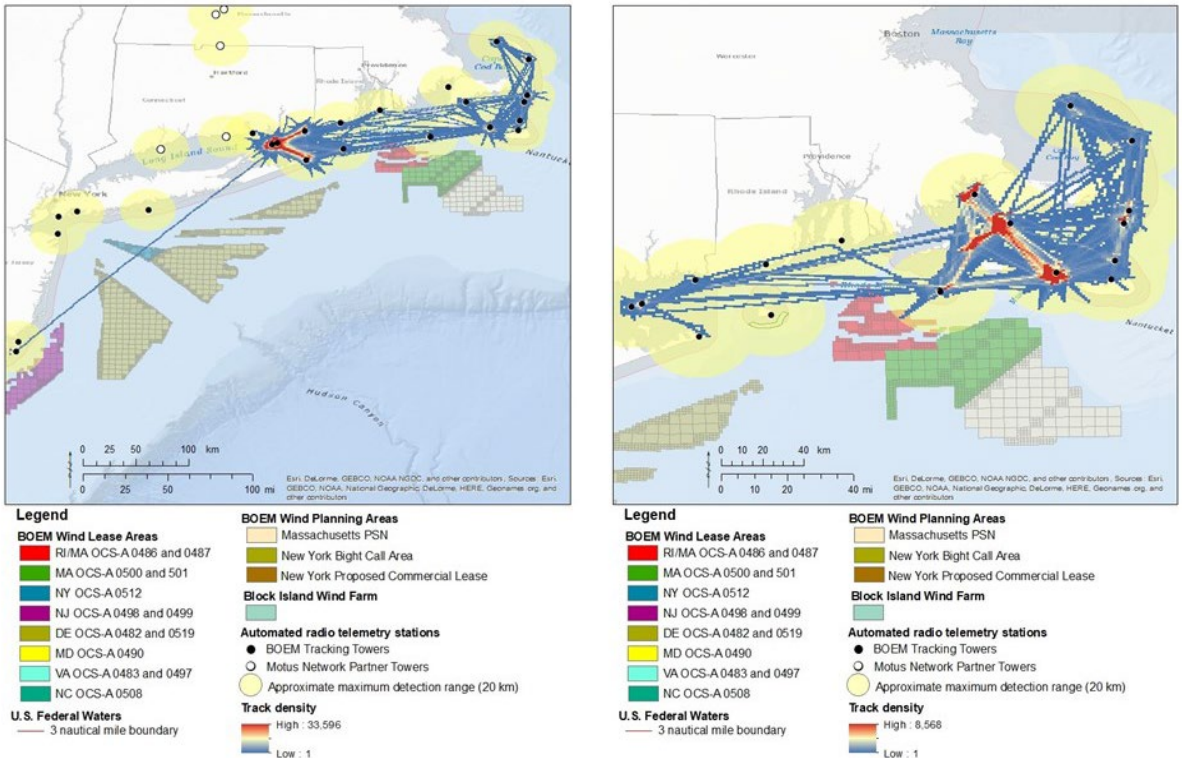
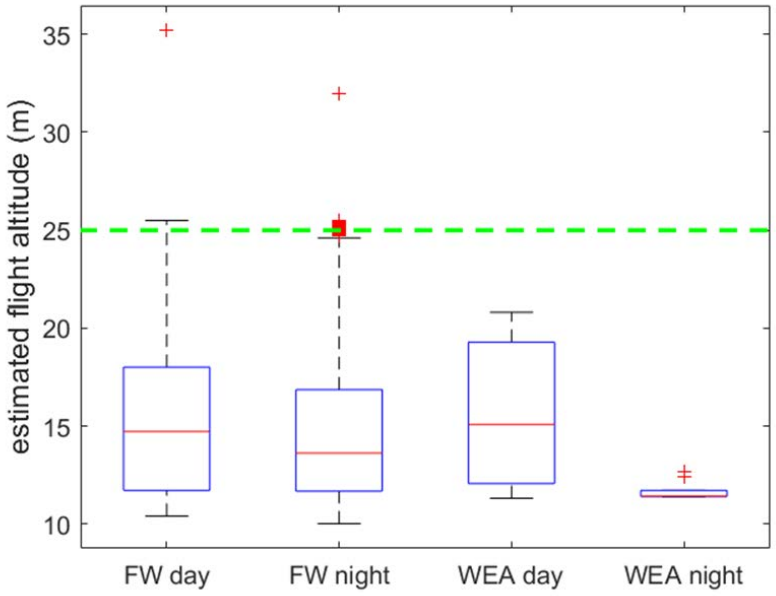


Figure 34. a) Track densities of roseate terns from a colony on Great Gull Island in 2015 to 2017; b) roseate terns from colonies in Buzzards Bay in 2016 and 2017[4]



Notes: The green-dashed line represents the lower limit of the RSZ (25 m).

Figure 35. Model-estimated flight altitude ranges (m) of roseate terns during exposure to federal waters (FW) and WEAs during day and night

[4] Track densities are 10-min tracks/km^2. Tracks recorded during the breeding and post-breeding periods. All years are pooled. Great Gull Island colony (n=90), Buzzards Bay colonies (n=60).

In conclusion, based on the behavioral and foraging ecology, telemetry data, and survey data, roseate tern activity is expected within the offshore Action Area. It is possible that small numbers of breeding and non-breeding terns, including 2-year-old birds and adults, may pass through the Action Area in spring, late summer, and early fall to rest on the water or travel to adjacent foraging habitat in Nantucket Shoals. Some individuals may also pass through the offshore Action Area during the spring and fall migration, but most of these flights through the Wind Farm Area are likely below RSZ elevations.

Although the last roseate tern breeding colony in Rhode Island disappeared in 1979 (Mayflower Wind 2022), there are continued sightings of roseate tern within the vicinity of the onshore Action Area in both Falmouth and Brayton Point including Falmouth heights, Massasoit Street Park, Seapowet Marsh, Fogland Beach Conservation, Sachuest Point National Wildlife Refuge, Falmouth town forest, Falmouth harbor, and Fuller field (eBird 2023). As stated in Section 4.2.2, information was requested from the Massachusetts NHESP regarding state-listed species, which may potentially be present in habitats traversed by the Action Areas in Falmouth. PHs 2158/176/and 887 were found to contain records for the roseate tern (E. Holt, personal communication). As started above in Section 4.2.2, Mayflower Wind requested information from RIDEM regarding state listed species that may be present in areas in the vicinity of the Brayton Point onshore Action Area. In response to that request, the RIDEM did identify roseate terns as known or potentially occurring within the Brayton Point onshore Action Area (COP Volume 2, Appendix J Table 4-10).

BOEM additionally reviewed the USGS GAP habitat data, which identified the roseate tern as occurring or potentially occurring in the Action Area covering the onshore Project elements and portions of the offshore ECCs (Figure 36, Figure 37, and Figure 38). Data from eBird shows records of roseate terns being sighted on beaches in southern Rhode Island, Martha's Vineyard, Nantucket, and Cape Cod. (eBird 2023). Overall, roseate terns have been observed in Massachusetts and Rhode Island, and consultations from NHESP and RIDEM did identify records of the roseate tern near or within the Falmouth and Brayton Point Action Areas. It is likely the roseate tern will occur in the onshore Action Areas to forage and migrate through coastal areas, including the Sakonnet River.

Figure 36. USGS GAP analysis roseate tern predicted habitat range for Project onshore facilities in Falmouth

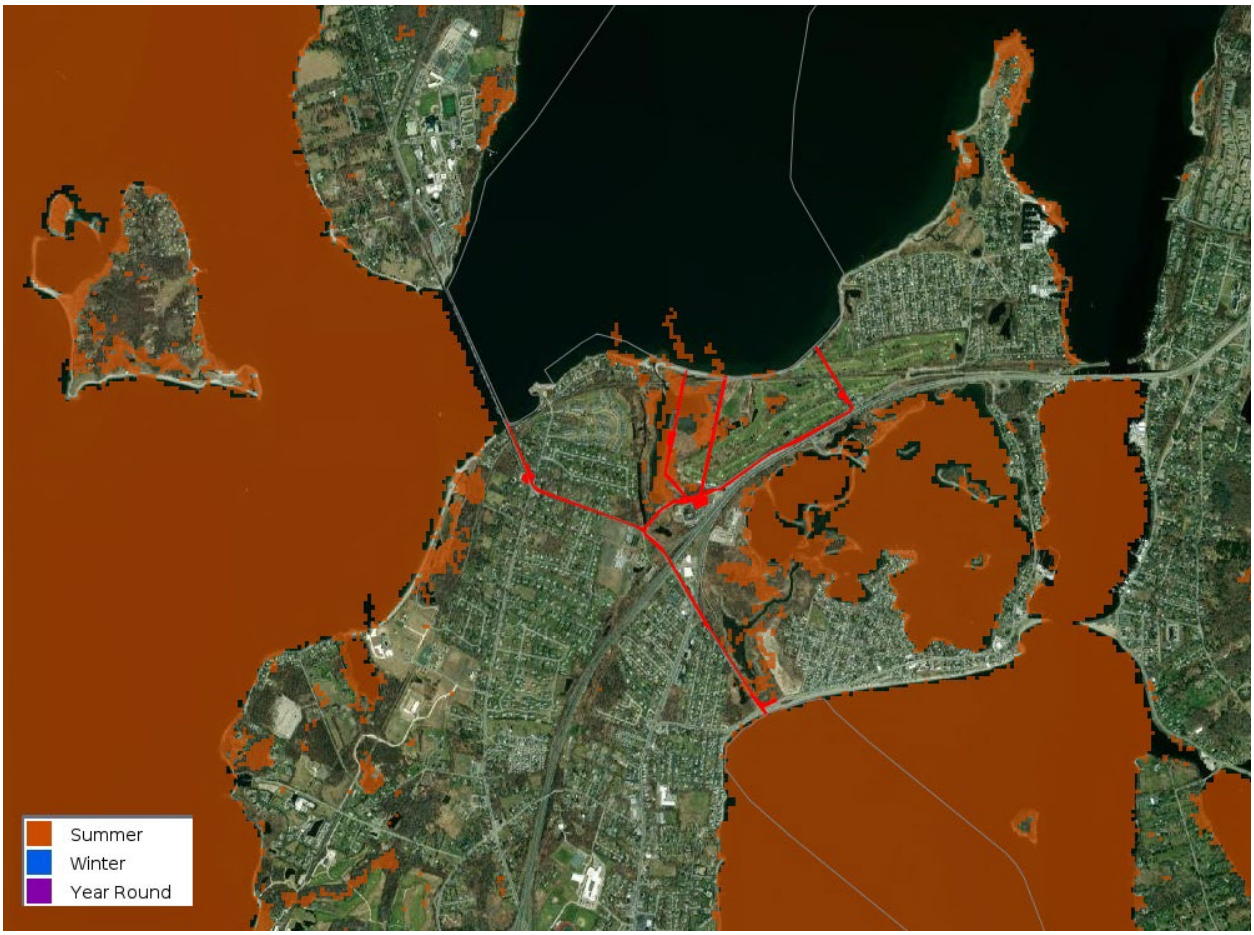


Figure 37. USGS GAP analysis roseate tern predicted habitat range for Project onshore facilities in Aquidneck Island

Figure 38. USGS GAP analysis roseate tern predicted habitat range for Project onshore facilities in Brayton Point

4.7 Monarch Butterfly

4.7.1 Species Description

The monarch butterfly occurs throughout the United States during the summer months and is a candidate species for federal listing. This species is recognizable in their adult stage due to the presence of bright orange wings covered with black veins and white spots reaching a wingspan of up to 3 to 4 inches (7 to 10 centimeters) (USFWS 2022a). During their larval stage and prior to metamorphosis, the monarch caterpillars are black and yellow with white stripes and can reach 2 inches (5 centimeters) in length (USFWS 2022a). Metamorphosis is completed in approximately 30 days and includes four stages: egg, larva, pupa, and adult (Jepsen et al. 2015). Adults deposit eggs on their obligate host plant, milkweed (*Asclepias* spp.), which larvae feed almost exclusively on as they grow and molt. Over the course of 9 to 18 days larvae undergo five larval instars upon which they pupate into a chrysalis before emerging into an adult butterfly 6 to 14 days later (USFWS 2022a).

East of the Rocky Mountains, most monarch butterflies migrate north in successive generations from overwintering areas in central Mexico to as far north as southern Canada. As they migrate north, monarch butterflies mate and deposit their eggs and die. The offspring typically survive 2 to 5 weeks in the adult stage, moving north generation by generation as temperatures warm and plants flower. After three to four generations, the population reaches the northern United States and southern Canada; the final generation

makes the return migration in the fall to overwintering sites. Monarch butterflies may travel over 1,864 miles (3,000 kilometers) during the fall migration for over two months. Unlike previous generations, the last generation of each year lives for about 8 months over winter and begins the multi-generational migration the following spring (NJDEP 2017). The preferred habitat for monarchs is open meadows, fields, and wetland edges with the presence of milkweed and flowering plants (Mass Audubon 2022). While overwintering, the eastern North American population prefers a specific microclimate of oyamel fir tree roosts found within mountainous regions in central Mexico (USFWS 2022a).

USFWS recently conducted a Monarch Species Status Assessment Report and found that past annual census data indicates that the eastern North American population has been declining over the last 26 years (USFWS 2020c). Specifically, monarch butterfly populations east of the Rocky Mountains, which are the largest of all populations, have declined by over 90 percent in the last three decades (CBD et al. 2014; Xerces 2020). USFWS (2020c) estimated the eastern North American population's probability of extinction in 60 years under current conditions ranges from 48 percent to 69 percent. USFWS determined in 2020 that listing the monarch butterfly as an endangered or threatened species is warranted but precluded by higher priority actions (85 *Federal Register* 81813). Candidate species are provided no statutory protection under the ESA; therefore, Section 7 consultation is not required. However, the monarch butterfly is evaluated here to streamline consultation should this species become listed in the future. Because the monarch butterfly is not listed under the ESA, no critical habitat is designated for the species.

Threats identified in the petition to list monarch butterflies include loss and degradation of habitat and loss of milkweed resulting from herbicide application, conversion of grasslands to cropland, loss to development and aggressive roadside management, loss of winter habitats from logging, forest disease, and climate change. The reduced availability, spatial distribution, and quality of milkweed and nectar plants associated with breeding and use of insecticides are most responsible for their decline (85 *Federal Register* 81813). In Rhode Island, additional threats monarchs face is confusing milkweed with the invasive swallow-wort (*Vincetoxicum nigrum* and *Vincetoxicum rossicum*), which is toxic to the larvae (RIDEM 2022).

Monarch butterflies have been recorded moving southward In Massachusetts from mid-August through late September and early October, with aggregations regularly seen along the coast, as well as in association with other leading lines including river valleys and ridgelines (Mass Audubon 2022). This species occurs in most areas of Massachusetts ranging from the western border to Cape Cod (Mass Audubon 2022). The southward migration of monarch butterflies in Rhode Island is known to peak in late September (EcoRI.org 2014).

Monarch butterflies may occur offshore as, occasionally, mass flights may be blown offshore, or monarchs may use offshore structures for resting during migration. Ross (1998) observed large numbers of monarchs resting on oil platforms 72 miles offshore in the Gulf of Mexico during migration. Additionally, Urquhart (1976) studied Peninsular Florida populations and noted monarchs may migrate via the offshore islands of Florida in the Gulf of Mexico and along the Florida Keys. Monarch butterflies can also be found onshore in open meadows and fields that usually contain a variety of wildflowers including milkweed, coastal beaches with dunes, and human-made butterfly gardens (NYSDEC n.d.[d]). Historical records indicate purple milkweed populations (*Asclepias purpurascens*) existed throughout Massachusetts with the exception of Bristol and Plymouth counties; however, current populations are now only known to occur from Barnstable and Hampshire counties (NHESP 2015e). Additionally, this species is considered historic in Rhode Island and New Hampshire (Farnsworth and DiGregorio 2001). Purple milkweed was further identified as potentially occurring in North Atlantic Coastal Plain Hardwood forests, which are found in both Massachusetts and Rhode Island (Native Plant Trust 2021). Additionally, the butterfly milkweed (*Asclepias tuberosa*), four-leaved milkweed (*Asclepias quadrifolia*), whorled

milkweed (*Asclepias verticillata*), and common milkweed (*Asclepias syriaca*) may potentially occur within Massachusetts and Rhode Island (Native Plant Trust 2021).

4.7.2 Monarch Butterfly in the Action Area

Data received using the USFWS IPaC system identified the monarch butterfly as potentially occurring in both the Falmouth and Brayton Point onshore Action Areas, as well as the offshore ECCs. Although no vegetation or monarch survey was conducted for the Falmouth and Brayton Point onshore Action Areas, natural communities present in Massachusetts and Rhode Island can be seen in Figure 7 and Figure 9. Purple milkweed was identified as potentially occurring in the onshore Action Areas and is a species of milkweed known to attract monarch butterflies (USDA n.d.) and an existing population of purple milkweed has been discovered in Falmouth, Massachusetts (Farnsworth and DiGregorio 2001). Surveys completed within the Camp Edwards area, located near onshore Project features in Falmouth, have identified 528 species of moths and butterflies, most of which were observed in the pitch pine-oak forest community (MARNG 2009). Monarch butterflies were not identified in this list, however common milkweed was and is further identified as a common plant of Camp Edwards (MARNG 2022).

The eastern North American monarch population has been observed both in Massachusetts and Rhode Island during the spring and fall migration period. As stated above, monarchs rely on their obligate host plant, *Asclepias* spp., which is known to occur in both Massachusetts and Rhode Island, and purple milkweed may possibly be present within the Falmouth onshore Action Area. It is likely that during the monarch's migration, this species will traverse areas of the Falmouth and Brayton Point onshore and offshore Action Areas. Habitat may be present within the vicinity containing wildflowers, including milkweed, which may attract monarch butterflies. Additionally, monarchs may traverse open water and are likely to occur within the offshore Action Area.

4.8 Sandplain Gerardia

4.8.1 Species Description

Sandplain gerardia is an annual plant found in Massachusetts, Connecticut, Rhode Island, New York, and Maryland (NHESP 2015c). This species was proposed to be listed as endangered pursuant to the ESA in 1987 (52 *Federal Register* 44450–44453) and was listed under the ESA as endangered in 1988 (53 *Federal Register* 34701–34705). This species is also listed as Endangered under the Massachusetts ESA (Mass Wildlife 2020). Currently, there is no critical habitat designated for this species. USFWS recently initiated a 5-year review for this species (83 *Federal Register* 39113–39115). Sandplain gerardia is recognizable due to its bell-shaped flowers with pink-purple blossoms and typically grows from 4 to 8 inches (10 to 20 centimeters) high and may occasionally reach up to 14 inches (40 centimeters) (NHESP 2015c). Sandplain gerardia requires open sandy areas for successful germination and growth (53 *Federal Register* 34701–34705) with a flowering season that occurs from late August through late September, with individual blossoms that only last for a day (NHESP 2015c). This species has a habitat preference for dry, sandy, poor-nutrient soils of serpentine barrens and sparsely vegetated grasslands sandplain environments (USFWS 2019a). Ongoing threats that sandplain gerardia populations face include a change in land use, vegetation succession, and loss of natural processes that maintain suitable habitat and habitat loss (USFWS 2019a).

USFWS initiated a 5-year review of sandplain gerardia in 2018 (83 *Federal Register* 39113–39115), which was published in 2019 (USFWS 2019a). This species has been observed in several areas including Maryland, New York, Rhode Island, Massachusetts, and Connecticut and results have indicated an increase from 1,218 plants at 10 sites in 1988 to 41, 382 plants at 13 sites that were surveyed in 2017. However, this total does not include the observation of over 100,000 plants that were discovered in Barnstable, Massachusetts in 2018 (USFWS 2019a citing Wernerehl personal communication 2018).

Within Massachusetts, sandplain gerardia is known to occur at several sites including Cranes, Oyster Watcha, Long Point/Scrubby Neck, Katama Plains, Bayview/Waquoit Bay National Estuarine Research Reserve, Percival Cemetery and Barnstable (USFWS 2019a). Additionally, this species is currently known from Barnstable and Dukes Counties, and historically known from Barnstable, Bristol, Dukes, Middlesex, Nantucket, and Worcester Counties (NHESP 2015c).

4.8.2 Sandplain Gerardia in the Action Area

Data received using the USFWS IPaC system identified sandplain gerardia as only potentially occurring in the Falmouth onshore Action Area. Sandplain gerardia populations have been observed in Massachusetts (USFWS 2019a); however, the Falmouth Action Area is outside the current known distributions of sandplain gerardia. As stated in Section 4.2.2, information was requested from the Massachusetts NHESP regarding state-listed species which may potentially be present in habitats traversed by the Action Areas in Falmouth. No PHs were found to contain records for sandplain gerardia (E. Holt, personal communication). Additionally, this species prefers dry grassland habitat and the limited grassland habitat in the Falmouth Action Area makes it unlikely this species will occur.

5. Effects of Proposed Action

Pursuant to ESA requirements, this BA analyzes the potential direct, indirect, and cumulative effects of the Proposed Action on northern long-eared bat, roseate terns, piping plovers, *rufa* red knots, monarch butterfly, and sandplain gerardia and/or their habitats to determine if the Proposed Action is likely to adversely affect these species or their habitats (50 CFR § 402.12). This analysis uses the following definitions in the effects determination:

- **No effect:** A listed resource is not exposed to the Proposed Action; therefore, no impacts (positive or negative) would occur.
- **May affect, not likely to adversely affect:** This is the appropriate determination if effects on listed species are either:
  - Beneficial, meaning entirely positive, with no adverse effects;
  - Insignificant, which are related to the size of the impact and include effects that are too small to be measured, evaluated, or are otherwise undetectable; or
  - Discountable, which are effects that are extremely unlikely to occur.
- **May affect, likely to adversely affect:** This is the appropriate determination if any direct or indirect adverse effects on listed species that are not entirely beneficial, insignificant, or discountable would occur as a result of the Proposed Action.

The impact-producing factors (IPF) of Project construction, operation, and decommissioning that have the potential to affect federally listed species under USFWS jurisdiction are summarized in Table 6.

Table 6. Impact-producing factors for empire wind project construction, O&M, and decommissioning on ESA-listed species

Impact-Producing Factor	Potentially Affected Species	Potential Type of Exposure
Presence of structures	Northern long-eared bat Tricolored bat Piping plover Roseate tern *Rufa* red knot Monarch butterfly	Injury and mortality behavioral
Accidental releases	Roseate tern	Injury and mortality behavioral
Noise	Northern long-eared bat Tricolored bat Piping plover Roseate tern *Rufa* red knot	Behavioral
Cable emplacement and maintenance	Roseate tern	Prey availability
Traffic (aircraft)	Piping plover Roseate tern *Rufa* red knot	Injury and mortality behavioral

Impact-Producing Factor	Potentially Affected Species	Potential Type of Exposure
Land disturbance	Northern long-eared bat Tricolored bat Monarch butterfly Sandplain gerardia Piping plover Roseate tern *Rufa* red knot	Habitat modification injury and mortality behavioral
Lighting	Piping plover Roseate tern *Rufa* red knot	Behavioral

5.1 Bats (Northern Long-Eared Bat and Tricolored Bat)

Potential IPFs from the construction, operation, and decommissioning of the proposed Project on northern long-eared bat include presence of structures, noise, and land disturbance.

5.1.1 Presence of Structures

The primary potential impact of the operational component of the Project on the northern long-eared bat and tricolored bat is mortality or injury resulting from collision with WTGs on the OCS. However, cave-hibernating bats are less likely to fly offshore even during the fall migration period as they do not typically occur more than 10 miles from shore (Sjollema et al. 2014) and if this species does migrate over water, movements are likely nearshore or between islands and the mainland during migration periods (Stantec 2018; Thompson et al. 2015; Tetra Tech and DeTect 2012; Ahlén et al. 2009). There have been limited studies of the movements of northern long-eared bats near the ocean, but all evidence to date suggests this species does not forage offshore (Dowling et al. 2017). From 2005 to 2006 long-term acoustic monitoring stations were set up on Assateague Island National Seashore, a barrier island off the Maryland coast (Johnson et al. 2011). Tricolored bat calls were recorded indicating that they are capable of migrating short distances, less than 1 mile (1.6 kilometers) between the island and the mainland. Furthermore, tricolored bats were recorded on Block Island NWR off the coast of Rhode Island, as well as the mainland indicating that from July to September, the tricolored bat migrated short distances (Smith and McWilliams 2012, 2016).

During the offshore construction phase of the Block Island Wind Farm, bats were acoustically monitored through vessel-based detectors and no *Myotis* calls including the northern long-eared bat or tricolored bats were detected among the 1,546 passes of bats (Stantec 2018). However, during the Fugro Enterprise bat acoustic survey, two acoustic bat detectors were deployed on the vessel railing from July 14 to November 15, 2017, while the vessel traveled from New Bedford, Massachusetts, to the northeast end of Long Island, around the Block Island Wind Farm and around the South Fork Wind Farm. Out of 896 passes identified, 34 calls were identified as the northern long-eared bat. Recent data from 3 years of post-construction monitoring around Block Island Wind Farm found relatively low numbers of bats present only during the fall, and no recorded presence of northern long-eared bats (Stantec 2020). During this monitoring, 80 passes were labeled as tricolored bats; however, none had characteristics that are diagnostic of the species and were presumably to be eastern red bats. Passive acoustic surveys conducted for the Block Island Wind Farm recorded several calls identified as *Myotis* species and approximately 29 percent as high frequency species that were not identified to genus (Tetra Tech and DeTect 2012). However, the unidentified calls may have been from *Myotis* species, tricolored bats, and/or eastern red bats. As previously mentioned in Section 4.2.2, bird and bat monitoring (August 2021 to November 2021) for Dominion Energy's CVOW offshore wind pilot project 27 miles off the coast of Virginia Beach, Virginia, did not detect any northern long-eared bats or tricolored bats (Dominion Energy 2022).

Collectively, this information indicates little use of the offshore environment by the northern long-eared bat and tricolored bat and that occurrence of these species in the offshore portions of the Action Area is expected to be very rare; therefore, exposure would be minimal and would only occur on rare occasions during migration. If northern long-eared bats or tricolored bats were to migrate over water, movements would likely occur close to the mainland and are unlikely to be exposed to WTGs in the Lease Area, which is 29.8 miles (48.0 kilometers) south of Martha's Vineyard, 23.0 miles (37.0 kilometers) south of Nantucket, and 44.7 miles (72.0 kilometers) from the mainland at Nobska Point in Falmouth, Massachusetts.

The species' exposure to vessels during construction, maintenance activities, or decommissioning, or to operating WTGs 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*).

5.1.2 Noise

Anthropogenic noise associated with offshore wind development, including noise from pile-driving and construction activities offshore, and construction activities onshore, 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 and onshore Action Area would result in minimal, if any, exposure to these potential impacts.

Pile-driving noise and onshore and offshore construction noise associated with the Proposed Action alone are expected to result in temporary and highly localized impacts on northern long-eared bats and tricolored bats should they be present at the time noise is generated. Auditory impacts are not expected to occur, as recent research has shown that bats may be less sensitive to temporary threshold shifts than other terrestrial mammals (Simmons et al. 2016). Impacts, if any, are expected to be limited to behavioral avoidance of pile-driving or construction activity, and no temporary or permanent hearing loss would be expected (Simmons et al. 2016).

The construction of offshore structures would create noise and may temporarily affect migrating northern long-eared bats and tricolored bats, if conducted at night during the spring or fall migration. The greatest impact of noise would likely be caused by pile-driving activities during installation of foundations for offshore structures. The Proposed Action would include a maximum of 149 WTG/OSP positions. Each WTG requires one monopile or three to eight pin piles, and each OSP requires one monopile or up to 27 pin piles with each pin pile or monopile requiring 2 or 4 hours of driving to install, respectively. Construction activity would be temporary and highly localized. Auditory impacts are not expected to occur, as recent research has shown that bats may be less sensitive to temporary threshold shifts than other terrestrial mammals (Simmons et al. 2016). Habitat-related impacts (i.e., displacement from potentially suitable habitats) could occur as a result of construction activities, which could generate noise sufficient to cause avoidance behavior by individual migrating tree bats (Schaub et al. 2008). These impacts would likely be limited to behavioral avoidance of pile-driving or construction activity, and no temporary or permanent hearing loss would be expected (Simmons et al. 2016). However, these impacts are highly unlikely to occur, as northern long-eared bats and tricolored bats seldom use the offshore Action Area, and only during spring and fall migration (Section 4.2.2).

The potential for short-term, temporary, localized habitat-related impacts (i.e., displacement from potentially suitable habitats) arising from onshore construction noise exists; however, as described in Section 4.2.2, the northern long-eared bat and the tricolored bat are not expected to occur in the Brayton Point onshore Action Area, but may possibly traverse areas of the Falmouth onshore Action Area while roosting and/or foraging. Onshore construction would produce noise in excess of ambient conditions due

to vehicles and heavy equipment used to construct the cable landfall adjacent to the nearshore zone, the onshore export cables, and the substation and converter station. Normal operation of the substation/converter station may generate a small amount of noise into the surrounding environment. Operational noise, however, is expected to be significantly less than noise associated with construction and bats are not likely to be sensitive to such disturbances. If northern long-eared bats and tricolored bats were present, no auditory impacts on bats would be expected to occur. Recent literature suggests that bats are less susceptible to temporary or permanent hearing loss from exposure to intense sounds (Simmons et al. 2016), and bats are tolerant to anthropogenic noise as documented instances have shown bats roosting in noisy environments near airports and highways (FAA 1992; Brack et al. 2004). Nighttime work may be required on an as-needed basis. Some temporary displacement or avoidance of potentially suitable foraging habitat could occur, but these impacts would not be expected to be significant. Some bats roosting in the vicinity of construction activities may be disturbed during construction but would be expected to move to a different roost farther from construction noise. This would not be expected to result in any impacts, as frequent roost switching is common among bats (Hann et al. 2017; Whitaker 1998).

Collectively, this information indicates that occurrence of northern long-eared bats and tricolored bats in the offshore Action Area are not expected and should northern long-eared bats of tricolored bats traverse the Falmouth onshore Action Area, their presence will occur during non-hibernation periods (May through October) while foraging and/or roosting. Therefore, exposure to noise would be minimal. Given the temporary and localized nature of potential noise impacts, and the expected insignificant response to those impacts, no individual fitness or population-level impacts would be expected to occur as a result of onshore or offshore noise associated with construction, O&M, and decommissioning. Mayflower Wind will consult with BOEM and USFWS to discuss best management practices (BMPs) available to avoid and minimize potential effects from construction and decommissioning to bats and will coordinate with MassWildlife, RIDEM, and USFWS to identify appropriate mitigation measures.

Therefore, because few, if any, northern long-eared bats or tricolored bats are expected to occur in the offshore Action Area and may occur in Falmouth onshore Action Area while roosting and/or foraging, 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*).

5.1.3 Land Disturbance

Impacts associated with construction of onshore elements of the Proposed Action could occur if construction activities take place during the active season (generally April through October) and may result in displacement, or direct injury or mortality of individuals, particularly juveniles who are unable to flush from a roost, if occupied by bats at the time of removal. The primary effects on northern long-eared bats and tricolored bats from the onshore components would be potential loss of suitable roosting or foraging habitat. The majority of Mayflower Wind's facilities would follow previously disturbed areas, which would result in no further additional habitat fragmentation, significant new open spaces, or open corridors. Where necessary, construction of onshore facilities may require clearing and permanent removal of some trees along the edge of the construction corridor. There are two buildable substation site options under consideration for the Falmouth onshore Action Area, which would require up to 26.0 acres (10.5 hectares) of land and are both located in previously disturbed areas, which are not likely to provide suitable habitat for summer foraging and/or roosting.

From the coastline, the Falmouth onshore export cable routes would traverse mostly developed areas of Falmouth, Massachusetts. Natural communities present along the Falmouth onshore export cable routes and underground transmission route include bare land, deciduous forest, developed open space, evergreen forest, grassland, impervious, wetlands, scrub/shrub, and unconsolidated shore. Some export cable route segments would traverse natural pockets of undisturbed environments. Species that thrive in edge

environments are likely to be found in these areas (COP, Appendix J; Mayflower Wind 2022). The two sites being considered for the onshore substation, the Lawrence Lynch site and the Cape Cod Aggregates site, primarily consist of disturbed and developed land currently used for sand and gravel mining and processing. At the Lawrence Lynch site, there are several constructed stormwater ponds on the site, but these features are not considered a valuable resource for either bat species due to their highly altered nature and function as a stormwater management facility. The converter station in the Brayton Point onshore Action Area will be constructed on up to 7.5 acres (3.0 hectares) of primarily disturbed and developed land. The Brayton Point onshore Action Area includes forested land, disturbed or developed land, wetland areas, grasslands, scrub-shrub areas, fragmented vegetated habitats, and coastal habitats. These habitats are predominately composed of disturbed or developed lands not likely to provide suitable habitat for the northern long-eared bat or the tricolored bat. Onshore construction disturbances are expected to be short-term for bats but would have permanent effects including new aboveground structures and lost habitat from limited tree clearing, which may be required for the onshore converter station/substation.

Additionally, routine ground disturbance is likely to occur during O&M near the onshore converter station/substation. Vegetation within approximately 50 feet (15.2 meters) would be maintained to knee level using a lawn mower, string trimmer, pruner, hedge trimmer, or similar based on final landscaping plans. However, vegetation maintenance will not be conducted outside of the property or lease boundary. Similar vegetation maintenance practices will be followed along any underground cable easements outside of paved roadway. Vegetation, where present, would be maintained to knee level or lower along a corridor up to 35 feet (10.7 meters) in width to protect the cables from potential damage due to large root systems. Routine ground disturbance would result in permanent alteration of natural habitats, which were disturbed prior during the construction phase.

Furthermore, Mayflower Wind intends to coordinate with applicable agencies including USFWS, MA DFW, and RIDEM to determine appropriate mitigation measures so the risk of direct mortality or injury during construction would be avoided. Mayflower Wind will consult with BOEM and USFWS to further discuss BMPs available to avoid and minimize potential effects from construction and decommissioning activities. Mayflower Wind would implement measures to avoid and minimize northern long-eared bat and tricolored bat impacts including not siting onshore Project infrastructure near key habitat locations for cave-hibernating species and burying onshore export cables underground beneath local roadways from landfall to the onshore substation site. BOEM anticipates that impacts would be minor given the limited amount of habitat removal and that any potential impact would be avoided or significantly reduced due to Mayflower Wind's proposed Project's avoidance, minimization, and mitigation measures. Therefore, impacts would not result in individual fitness or population-level effects.

Given the lack of high-quality northern long-eared or tricolored bat habitat and minimal habitat impacts, no individual fitness or population-level impacts would be expected to occur as a result of land disturbance associated with construction, O&M, and decommissioning. Furthermore, Mayflower Wind would implement the aforementioned measures to avoid and minimize bat impacts. Therefore, because few, if any, northern long-eared bats or tricolored bats are expected to be in the Action Area and habitat is generally lacking, potential effects from land disturbance 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*).

5.1.4 Avoidance, Minimization, and Mitigation Measures

The COP, Volume 2, Table 16-1 (Mayflower Wind 2022) provides a list of Applicant-proposed measures (APMs) to avoid, minimize, or mitigate impacts and to perform monitoring of potential impacts. Several APMs identified for bats would be beneficial to the northern long-eared bat and tricolored bat:

- The northern long-eared bat is listed as a species of greatest conservation need in the 2015 Rhode Island Wildlife Action Plan. Northern long-eared bats use maternity roost sites during the summer and hibernacula sites during the winter, and the loss of these habitat features is a threat to northern long-eared bats. On April 8, 2022, Mayflower Wind contacted RIDEM Division of Fish and Wildlife, for information on northern long-eared bat maternity roosts and hibernacula in the vicinity of the Project. According to her response, dated April 12, 2022, there are no known northern long-eared bat maternity roosts or hibernacula in or near (within 5 miles) the Project area. Conversion of foraging and roosting habitats is also expected to be minimal for the Project as the onshore Project components are planned to be installed primarily within roadways and roadway shoulders to mitigate impacts on rare species and tree clearing will be avoided.
- Mayflower Wind will site Project components to avoid locating onshore facilities or landfall sites in or near significant fish and wildlife habitats, including known hibernacula, maternal roosting colonies or other concentration areas as practicable. The proposed onshore substation site and converter station will be constructed in primarily open, developed areas.
- Mayflower Wind will site Project components to avoid locating onshore facilities or landfall sites in or near significant fish and wildlife habitats, including known hibernacula, maternal roosting colonies or other concentration areas as practicable. The proposed onshore substation site and converter station will be constructed in primarily open, developed areas.
- Mayflower Wind will coordinate with MassWildlife, RIDEM, and USFWS to identify appropriate mitigation measures.
- Mayflower Wind will ensure that lighting will be minimized to reduce potential attraction of bats to vessels and vehicles during construction activities within the Onshore and Offshore Project areas to the extent practicable.
- Mayflower Wind will consult with BOEM and USFWS to discuss BMPs available to avoid and minimize potential effects from construction/decommissioning on bats.
- Mayflower Wind is requiring construction equipment to be operated such that the construction-related noise levels comply with applicable sections of the MassDEP Air Quality Regulation at 310 CMR 7.10, which would minimize impacts on bats.

Mayflower Wind has proposed numerous other APMs for terrestrial vegetation and wildlife several of which could also serve to conserve northern long-eared bats, and tricolored bats and their habitat which include:

- Mayflower Wind will site Project components to avoid locating onshore facilities and landfall sites in or near significant fish and wildlife habitats to the greatest extent practicable. The proposed onshore substation site and the converter station site will be constructed in primarily open, developed areas.
- Mayflower Wind will train construction staff on biodiversity management and environmental compliance requirements.
- An environmental compliance monitor will be hired to provide oversight of terrestrial construction activities.

- Mayflower Wind will bury the onshore export cables underground beneath local roadways from landfall to the onshore substation site.
- If tree clearing is required, Mayflower Wind will conduct habitat assessments and presence/absence surveys and will coordinate with MassWildlife, RIDEM, and USFWS as appropriate.
- Mayflower Wind will, to the extent practicable, conduct construction activities outside of periods when highly sensitive species are likely to be present.
- Mayflower Wind will implement erosion and sediment control measures in areas adjacent to water resources, such as wetlands, ponds, and other waterbodies, or in areas with significant grades that would make them prone to erosion.
- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will ensure lighting will be minimized to the extent practicable to reduce potential displacement or attraction of wildlife species to Project sites during construction activities in the Project area.
- Vehicle speed limits will be enforced at all Project sites to minimize potential for vehicle collisions with wildlife.
- Mayflower Wind will conduct presence/absence surveys; surveys for protected plant and wildlife species will be completed as needed to inform the detailed engineering and design of the Project facilities.
- Mayflower Wind will ensure that standard construction BMPs (including erosion and sediment control measures) will be implemented to avoid dewatering discharge scour and siltation to nearby receiving waters, including wetlands.
- Mayflower Wind will implement a construction-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.
- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement an operations-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.
- Mayflower Wind will implement a Vegetation Management Plan approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement erosion and sediment control measures in accordance with applicable regulations.
- Mayflower Wind will prepare a Construction Management Plan (CMP) to guide contractors during construction and ensure that environmental protection and sound construction practices are implemented throughout construction. The CMP will reflect permitting updates and include commitments made during environmental reviews and permitting processes as well as permit conditions. The CMP will outline feasible measures that will be implemented to eliminate or minimize impacts including, but not limited to, traffic management, soil management, air quality, noise, water quality, erosion and sedimentation, solid waste management, soil management, spill control, and archaeological resources. The CMP will include BMPs to minimize construction period environmental impacts.

Mayflower Wind has developed a draft *Avian and Bat Monitoring Framework* (Framework) to outline Mayflower Wind's approach to post-construction avian and bat monitoring, overarching monitoring objectives, proposed monitoring elements, and reporting requirements (see Appendix C for details). The Framework pertains to the offshore portions of the Action Area within the Lease Area only and does not apply to the offshore export cables, cable landfall sites, or onshore portions of the Project. The measures proposed in the Framework are intended to support the advancement of the understanding of bird and bat interactions and address the uncertainty on bird and bat use of the offshore environment and the potential collision impacts from operating the offshore Project components. The scope of monitoring in the draft Framework is designed to meet federal requirements 30 CFR 585.626(b)(15) and 585.633(b) and is scaled to the size and risk profile of the Project with a focus on species of conservation concern (e.g., federally and state-listed species). The draft Framework will also support BOEM's ESA Section 7 Consultation and the EIS. A detailed *Avian and Bat Post-Construction Monitoring Plan* (Monitoring Plan), based on this Framework, will be developed in coordination with BOEM, USFWS, and other relevant regulatory agencies as the NEPA process for the Project progresses. Where feasible, monitoring conducted in the Lease Area will be coordinated with monitoring at other offshore wind projects in the Massachusetts and Rhode Island Wind Energy Areas (MA/RI WEAs) to facilitate integrated analyses across a broader geographic area. Table 7 highlights the proposed avian and bat monitoring objectives and methods.

Table 7. Monitoring objectives, general approached to be used, and types of data generated adapted from Appendix C

Taxa	Monitoring Objective	Approach	Duration	Time of Year	Data Output
Bats	Monitor occurrence of bats	Acoustics	2 years	Late winter/early spring – late fall/early winter	Presence; temporal and weather patterns
Birds	Monitor use of ESA-Listed birds	Radio-tags	Up to 3 years	Spring, summer, fall	Presence; temporal and weather patterns
Birds	Monitor use by nocturnal migratory birds	Radar	Up to 2 years	TBD	Presence; temporal and weather patterns
Birds	Monitor movement of marine birds around WTGs	Radar	Up to 2 years	TBD	Species, flight height, activity, avoidance behavior
Both	Document mortality	Incidental Observations	Project lifetime	All year	Incidence, identification

Mayflower Wind plans to conduct acoustic monitoring to detect bat activity within the Lease Area. This data will be used to help inform key data gaps pertaining to species presence and/or composition, temporal patterns of bat activity, and further correlation between weather and atmospheric conditions. Mayflower Wind plans to conduct acoustic monitoring for bat presence two years post-construction. Within the Lease Area, appropriate bat detector devices will be installed on offshore Project components in early spring or late winter, then removed late fall or early winter after migration, or the most appropriate period. Coordination between BOEM, USFWS, Mayflower Wind, and other relevant regulatory agencies will occur to determine optimal monitoring locations and durations of monitoring.

The acoustic monitoring detector devices will record calls of both cave-hibernating and migratory tree bats. The collected data will then be used to identify bats to the species levels to the best extent possible. Approved software will be used to process all acoustic data recorded and filter out poor-quality data and identify presence of bat calls. An experiences acoustician will then classify high-frequency calls to the

highest resolution possible (e.g., species, genus family). Mayflower Wind plans to submit an annual Monitoring Report to BOEM summarizing the post-construction monitoring activities, preliminary results as they become available, and proposed changes within the monitoring program. Coordination between BOEM, USFWS, and Mayflower Wind will occur as necessary to discuss the report, and adaptive changes to the Monitoring Plan.

Furthermore, over the course of monitoring, Mayflower Wind additionally plans to work with BOEM, USFWS, MassWildlife, RIDEM, and other relevant regulatory agencies to determine the need for adjustments to monitoring approached, consideration of new monitoring technologies, and/or additional periods of monitoring based on an ongoing assessment of monitoring results. The potential triggers for adaptive monitoring may include, but are not limited to, equipment failure, an unexpected impact to bats or birds identified through monitoring, or new opportunities to collaborate with other projects in the region. The monitoring plan will include a series of potential adaptive monitoring actions, developed in coordination with BOEM, USFWS, and other relevant regulatory agencies. Additionally, Mayflower Wind will submit an annual Monitoring Report to BOEM summarizing post-construction monitoring activities, preliminary results as available, and any proposed changes in the monitoring program. Mayflower Wind will consult with BOEM and USFWS, as necessary, to discuss the report and adaptive changes to the monitoring plan.

As part of efforts to ensure that the nation's development of energy resources on the OCS are done in a manner protective of the natural environment, BOEM will identify conditions for the Lessee to abide by as they pertain to protected species and habitat. BOEM's conditions will likely be similar to those described in previous consultations with South Fork Wind and Vineyard Wind (BOEM 2022a, 2021). These measures may include:

- Tree Clearing Time-of-Year Restrictions during construction. The Lessee must not clear trees greater than 3 inches (7.6 centimeters) in diameter at breast height from June 1 to July 31 of any year to protect northern long-eared bats. The Lessee may choose to conduct presence/probable absence surveys pursuant to current USFWS protocols for purposes of requesting and obtaining a waiver from this time-of-year restriction on tree clearing. The Lessee must submit any requests for waivers from this time-of-year restriction to the Department of the Interior (DOI) and such requests must be approved in writing by DOI.
- Annual Bird Mortality Reporting during construction, operations, and decommissioning. By January 31 of each year, Mayflower Wind must provide an annual report to BOEM and USFWS documenting any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. The report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with federal or research bands must be reported to the United States Geological Survey Bird Band Laboratory, available at https://www.pwrc.usgs.gov/bbl/. Any occurrence of a dead ESA-listed bird or bat must be reported to BOEM, BSEE (OSWsubmittals@bsee.gov), and USFWS as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting, and, if practicable, the dead specimen will be carefully collected and preserved in the best possible state.
- The development of an avian and bat monitoring program during construction and operation. At least 45 calendar days before beginning surveys, the Lessee must complete, obtain concurrence from DOI, and adopt an Avian and Bat Monitoring Plan as described in Appendix C (Avian and Bat Post-Construction Monitoring Framework) of the Final Environmental Impact Statement (FEIS), including coordination with interested stakeholders. DOI will review the Avian and Bat Monitoring Plan and provide any comments on the plan within 30 calendar days of its submittal. The Lessee must resolve all comments on the Avian and Bat Monitoring Plan to DOI's satisfaction before implementing the plan. The Lessee may conclude that DOI has concurred in the Avian and Bat Monitoring Plan if DOI

provides no comments on the plan within 30 calendar days of its submittal date. Under this condition the Lessee must allow for:

1. Monitoring. The installation of acoustic monitoring devices for birds and bats; installation of Motus receivers on WTGs in the WDA and support with upgrades or maintenance of two onshore Motus receivers; up to x Motus tags per year for up to 3 years to track Roseate Terns, Common Terns, and/or nocturnal passerine migrants; pre- and post-construction boat surveys; and avian behavior point count surveys at the boat-based survey vessel or from turbine platforms.
2. Annual Monitoring Reports. The Lessee must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWSubmittals@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within 6 months of completion of the last avian survey. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. DOI will use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the Avian and Bat Monitoring Plan. DOI reserves the right to require reasonable revisions to the Avian and Bat Monitoring Plan and may require new technologies as they become available for use in offshore environments.
3. Post-Construction Quarterly Progress Reports. The Lessee must submit quarterly progress reports during the implementation of the Avian and Bat Monitoring Plan to BOEM (at renewable_reporting@boem.gov) and the United States Fish and Wildlife Service (USFWS) by the 15th day of the month following the end of each quarter during the first full year that the Project is operational. The progress reports must include a summary of all work performed, an explanation of overall progress, and any technical problems encountered.
4. Monitoring Plan Revisions. Within 15 calendar days of submitting the annual monitoring report, the Lessee must meet with BOEM and USFWS to discuss the following: the monitoring results; the potential need for revisions to the Avian and Bat Monitoring Plan, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If DOI determines after this discussion that revisions to the Avian and Bat Monitoring Plan are necessary, DOI may require the Lessee to modify the Avian and Bat Monitoring Plan. If the reported monitoring results deviate substantially from the impact analysis included in the FEIS,11 the Lessee must transmit to DOI recommendations for new mitigation measures or monitoring methods.
5. Raw Data. The Lessee must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to DOI and USFWS, upon request for the duration of the Lease. The Lessee must work with BOEM to ensure the data are publicly available.

5.2 Birds (Piping Plover, *Rufa* Red Knot, Roseate Tern)

Potential IPFs from the construction, operation, and decommissioning of the proposed Project on federally listed birds include presence of structures, noise, land disturbance, cable emplacement and maintenance, lighting, traffic (aircraft), and accidental releases.

5.2.1 Presence of Structures

The primary hazard posed to federally listed birds from offshore wind energy development would be collision mortality (Everaert and Stienen 2007; Furness et al. 2013; Robinson Willmott et al. 2013). This section focuses on the collision risk from WTGs for the piping plover, *rufa* red knot, and roseate tern and uses the most relevant information about known occurrences and species' interactions with offshore wind developments on the Atlantic OCS. BOEM followed the parameterization of the Band Model (Band

2012) to evaluate the risk of bird collision with operating WTGs in offshore wind farms. The Band Model factors bird size and flight behavior, number of individuals passing through the migratory corridor, migratory corridor and wind farm width, number of WTGs, RSZ area, percentage of individuals flying at altitudes within the RSZ, predicted operating time during the migration season by month, and a behavioral avoidance modifier to estimate collision risk. However, because a small percentage from each of these species are likely to enter into the proposed Lease Area (Sections 4.4.2, 4.5.2, and 4.6.2), collision risk is analyzed qualitatively below.

5.2.1.1 Piping Plover

The piping plover is among 72 species populations (out of 177 on the Atlantic OCS) that is ranked "medium" in its relative vulnerability to collision with WTGs (Robinson Willmott et al. 2013). The distance from shore to the Project WTGs precludes the occurrence of nesting and foraging piping plovers in the vicinity of the Projects' WTGs, and non-migratory movements in May through August appear to be exclusively coastal (Burger et al. 2011). Flight heights during this non-migratory period are generally well below the RSZ and occur in the immediate vicinity of the coastline (USFWS 2008; Burger et al. 2011).

It is unlikely that piping plover regularly migrate over the Lease Area (see Section 4.4.2). A 3-year telemetry study that modeled plover fall migration found that none of the modeled flight paths flew over the Lease Area (Figure 18 and is the reason BOEM did not use the Band Model to estimate collision risk). In the unlikely event that plovers do fly through the Lease Area, it is very likely that they would be flying above the turbine RSZ (Section 4.4.2). Although low cloud ceiling conditions could bring migrating birds to lower elevations into the RSZ (Hüppop et al. 2006), Loring et al. (2017) found that piping plover migration typically occurs during favorable weather conditions with high visibility, little to no precipitation, and high atmospheric pressure. Piping plovers like most birds also have excellent vision that is far superior to mammals and excellent maneuverability in the air (Burger et al. 2011) and thus could easily see turbines from several miles away and adjust flight paths to avoid them and the blades.

To further inform this ESA consultation, BOEM used the Stochastic Collision Risk Assessment for Movement (SCRAM) to estimate the annual likelihood of collision and the annual number of collisions with rotating turbine blades. SCRAM uses bird passage rates based on modeled flight paths of birds fitted with nanotag transmitters (Gilbert et al. 2022). The use of tracking data is representative of bird movements, because the locations are recorded day and night for weeks and even months regardless of weather conditions. As recommended, the model was run for 1,000 iterations using Option 3 (Gilbert et al. 2022). The threshold number of collisions was set at one—this represents a collision of one or more individuals (any value less than one would be biologically nonsensical). SCRAM also estimates the average annual number of collisions with a 95 percent confidence interval (any value less than one is also biologically nonsensical). SCRAM does not estimate the probability of a collision or the number of collisions for the life of a project. However, the probability of a collision and number of collisions during the life of the project by extrapolating from the annual estimates from SCRAM; of course, this approach adds a whole new set of biological and statistical assumptions. Two scenarios were considered: (1) 147 operating 15 MW turbines with a 53-foot (16-meter) airgap below the RSZ; and (2) 147 operating larger turbines with a 144-foot (44-meter) air gap.

SCRAM predicts that the annual probability of a collision in each scenario was <0.001, thus, a single collision during fall migration is extremely unlikely under both scenarios **(**Table 8). SCRAM also predicts that the average annual number of collisions and 95 percent confidence interval is well below 1 (biologically nonsensical; Table 8). Based on this information, the probability of a collision event during the 35-year operational period is also very small 0.034 (= 1- $(1-0.001)^{35\ years}$). Similarly, the average number of collision and the 95 percent confidence interval is less than one (Table 9).

Based on the above findings including the results from the SCRAM collision risk model, the chance of a fatality due to collision is extremely unlikely, and thus the estimated annual number of fatalities for migrating piping plovers was **zero** for both scenarios**.** Likewise, the estimated number of fatalities during the 35-year operations term was also **zero**. Therefore, based on the above findings, the likelihood of collision fatalities resulting from the Proposed Action would be too small to be measured or evaluated (*insignificant*) and unlikely to occur (*discountable*), and the proposed action is not likely to adversely affect to piping plovers.

5.2.1.2 Roseate Tern

The roseate tern is one among 61 species populations (out of 177 on the Atlantic OCS) that was ranked "higher" in its relative vulnerability to collision with WTGs (Robinson Willmott et al. 2013). This high ranking is partially driven by the amount of time the species spends foraging on the ocean; if time on the ocean was restricted to migration, the population would be ranked "medium."

During the Mayflower Wind's Aerial HD spring surveys, a few roseate terns were observed in three BOEM blocks (Figure 32). Additionally, statistical models using the survey data, predict an absence of roseate terns in the area proposed for offshore wind turbines. Although it is possible for migrating roseate terns to pass through the Lease Area, a recent multi-year study did not track any migrating roseate terns through the area proposed for offshore wind turbines in fall (Loring et al. 2019). However, collision with WTGs is unlikely because terns are agile fliers and can easily avoid WTGs. In addition, terns typically fly on the OCS during daytime when visibility was greater than 3 miles (5 kilometers), and at 36 to 65 feet (11 to 20 meters) above the water (Loring et al. 2019). Further, 38 percent of the flights are when wind speeds are less than 4 meters per second when the turbines will not be spinning because turbine cut-in speeds range from 3 to 5 meters per second.

Although "take" (a fatality due to colliding with a moving turbine blade) is unlikely due to reasons described above, a quantitative analysis was conducted. Typically, quantitative analyses are performed when "take" is expected and there is a need to estimate the amount of "take". Nevertheless, the quantitative analysis was conducted as an alternative approach to determine if there will be take.

BOEM used the Band Model (Band 2012) to evaluate risk of injury or mortality to roseate tern from collision with turbines. Model input parameters and results are provided in Appendix B. The proportion of population that flies through the Mayflower WDA during migration is not currently known; therefore, it was assumed that the birds will spread themselves evenly along a 'migration front' spanning 84 miles (135 kilometers) between Block Island and Monomoy; only birds passing through the 39 kilometers wide Mayflower WDA would be exposed to the wind farm. For spring migration (April and May), the number of passages through the migration front was based on the number of US and Canadian breeding adults in 2016. In June and July, the number of passages by second year birds migrating from South America was based on the number that fledged in 2015 in New York, Connecticut, and Massachusetts and survived to 2017. For fall migration, all U.S. and Canadian breeding adults (2017), fledglings (2017), and 2nd year birds (2015 birds that survived to 2017) passed through the front. Developer surveys of the Lease Area detected several roseate terns in May and April, a separate ('other use') analysis was conducted to explore the potential risk to birds that may be in the Mayflower WDA in early spring (April & May). Turbine avoidance rate of 95.01 percent was used for roseate tern (Cook 2021). Two scenarios were considered: (1) 147 operating 15 MW turbines with a 53-foot (16-meter) airgap below the RSZ; and (2) 147 operating larger turbines with a 144-foot (44-meter) air gap. The monthly proportion of time wind was above turbine cut-in and below cut-out speeds was not available, so wind availability was based on another project off Rhode Island. This estimate does not include downtime due to maintenance, unscheduled repairs or other reasons which can on average reduce the turbine operational time to 80 percent (Feng et al. 2010)—a decrease in operational time will reduce the estimated mortality to birds. The average revolutions per minute (rpm) for a turbine operating at the site is not known, so the maximum (rated) rpm

speed was used. This is likely to be greater than the average rpm and will likely increase the estimated mortality. The flight height distribution was derived from the midpoints of 1,758 ten-minute observations of 75 roseate terns flying nonstop over federal waters; note that the error associated with these observations was relatively large (Loring et al. 2018). Given that the flight height distribution has been estimated for this species, modeled fatalities are based on calculations from the extended model (Option 3). Using these inputs and the operational parameters specified in Appendix B, no roseate terns would occur at rotor height or would fly through the RSZ in any given year, and thus, the number of annual fatalities due to collision is zero (Appendix B).

To further inform this ESA consultation, BOEM used SCRAM to estimate the annual likelihood of collision and the annual number of collisions with rotating turbine blades. SCRAM uses bird passage rates based on modeled flight paths of birds fitted with nanotag transmitters (Gilbert et al. 2022). The use of tracking data is representative of bird movements, because the locations are recorded day and night for weeks and even months regardless of weather conditions. As recommended, the model was run for 1,000 iterations using Option 3 (Gilbert et al. 2022). The threshold number of collisions was set at one—this represents a collision of one or more individuals (including values less than would be biological nonsensical). SCRAM also estimates the average annual number of collisions with a 95 percent confidence interval (any value less than one is also biologically nonsensical). SCRAM does not estimate the probability of a collision or the number of collisions for the life of a project. However, the probability of a collision and number of collisions during the life of the project by extrapolating from the annual estimates from SCRAM; of course, this approach adds a whole new set of biological and statistical assumptions. Two scenarios were considered: (1) 147 operating 15 MW turbines with a 53-foot (16-meter) airgap below the RSZ; and (2) 147 operating larger turbines with a 144-foot (44-meter) air gap.

SCRAM predicts that the annual probability of a collision in each scenario was <0.001, thus a single collision during fall migration is extremely unlikely under both scenarios (Table 8). SCRAM also predicts that the average annual number of collisions and 95 percent confidence interval is well below 1 (biologically nonsensical; Table 8). Based on this information, the probability of a collision event during the 35-year operational period is also very small 0.034 (= 1- $(1\text{-}0.001)^{35\ \text{years}}$). Similarly, for the scenario with the 144-foot (44-meter) air gap, the average number of collision and the 95 percent confidence interval is less than one (Table 9). However, the average number of collision and the upper portion of the 95 percent confidence interval were greater than one for the scenario with the 53-foot (16-meter) air gap (Table 9), suggesting that the collision of one to two roseate terns with turbine blades during the life of the Project.

Based on the results from the collision risk models, the chance of a fatality due to collision is extremely unlikely and, thus, the estimated annual number of fatalities for migrating roseate terns was **zero** for both scenarios**.** However, collisions are possible during the 35-year operations term when the airgap is 53 feet (16 meters) but **zero** for larger air gap of 144 feet (44 meters). Until there is more certainty from the developer regarding the size of the airgap between the lower tip of the blade and the water, the likelihood of collision fatalities resulting from the Proposed Action is possible.

5.2.1.3 *Rufa* Red Knot

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

The distance from shore to the offshore portions of the Action Area precludes use by foraging *rufa* red knots. As stated previously, rufa red knots nest in Canada, and some rufa red knots may stop on Long Island during migration and feed on shore. Similar to piping plover above, rufa red knot exposure to the

Projects' WTGs would be limited to migrating individuals. For this BA, the population of interest during the fall migration consists of the short-distance migrant subset of the *rufa* red knot population that stages at or near the Monomoy National Wildlife Refuge; these birds fly in a westerly direction that may include the offshore portions of the Action Area. *Rufa* red knots are known to fly at great heights during migration (78 *Federal Register* 60024) and thus most likely will safely pass over the turbines. In addition, most *rufa* red knots migrate during high visibility conditions (~12.4 miles [~20 kilometers]) with little or no precipitation; therefore, if some do fly within the RSZ, they would be able to see, maneuver, and avoid the widely spaced turbines.

Although "take" (a fatality due to colliding with a moving turbine blade) is unlikely due to reasons described above, a quantitative analysis was conducted. Typically, quantitative analyses are performed when "take" is expected and there is a need to estimate the amount of "take". Nevertheless, the quantitative analysis was conducted as an alternative approach to determine if there will be "take".

The Band Model (Band 2012) input parameters and results for rufa red knot are presented in Appendix B. The flight height distribution was derived from the midpoints of 379 10-minute observations of 51 red knots flying nonstop over federal waters; note that the error associated with these observations was relatively large (Loring et al. 2018). Turbine avoidance rate of 95.01 percent was used for roseate tern (Cook 2021). Two scenarios were considered: (1) 147 operating 15 MW turbines with a 53-foot (16-meter) airgap below the RSZ; and (2) 147 operating larger turbines with a 144-foot (44-meter) air gap. The monthly proportion of time wind was above turbine cut-in and below cut-out speeds was not available, so wind availability was based on another project off Rhode Island. This estimate does not include downtime due to maintenance, unscheduled repairs or other reasons which can on average reduce the turbine operational time to 80 percent (Feng et al. 2010)—a decrease in operational time will reduce the estimated mortality to birds. The average rpm for a turbine operating at the site is not known, so the maximum (rated) rpm speed was used. This is likely to be greater than the average rpm and will likely increase the estimated mortality. Given that the flight height distribution has been estimated for this species 5, modeled fatalities are based on calculations from the extended model (Option 3). Out of the 165 passes through the wind farm, the Band Model estimates a total of 55 and 128 potential annual bird transits through the turbine RSZ under both the 53-foot (16-meter) and 144-foot (44-meter) air gap scenarios (respectively) with one collision under a no-avoidance assumption (this is equitant to flying blind-folded) and zero annual fatalities when avoidance is at 95 percent.

To further inform this ESA consultation, BOEM used SCRAM to estimate the annual likelihood of collision and the annual number of collisions with rotating turbine blades. SCRAM uses bird passage rates based on modeled flight paths of birds fitted with nanotag transmitters (Gilbert et al. 2022). The use of tracking data is representative of bird movements, because the locations are recorded day and night for weeks and even months regardless of weather conditions. As recommended, the model was run for 1,000 iterations using Option 3 (Gilbert et al. 2022). The threshold number of collisions was set at one – this represents a collision of one or more individuals (including values less than would be biological nonsensical). SCRAM also estimates the average annual number of collisions with a 95 percent confidence interval (any value less than one is also biologically nonsensical). SCRAM does not estimate the probability of a collision or the number of collisions for the life of a project. However, the probability of a collision and number of collisions during the life of the project by extrapolating from the annual estimates from SCRAM; of course, this approach adds a whole new set of biological and statistical assumptions. Two scenarios were considered: (1) 147 operating 15 MW turbines with a 53-foot (16-meter) airgap below the RSZ; and (2) 147 operating larger turbines with a 144-foot (44-meter) air gap.

[5] The flight height distribution derived from GPS tracked red knots from the Biodiversity Research Institute (BRI) and Wildlife Restoration Partnerships (2022) and Feigin et al. (2022) studies are not available at this time.

SCRAM predicts that the annual probability of a collision in each scenario was <0.001, thus, a single collision during fall migration is extremely unlikely under both scenarios (Table 8). SCRAM also predicts that the average annual number of collisions and 95 percent confidence interval is well below 1 (biologically nonsensical; Table 8). Based on this information, the probability of a collision event during the 35-year operational period is also very small 0.034 (= 1- (1-0.001)$^{35\ years}$). Similarly, the average number of collision and the 95 percent confidence interval is less than one (Table 9).

Based on the results from the collision risk models, the chance of a fatality due to collision is extremely unlikely, and thus the estimated annual number of fatalities for migrating *rufa* red knots was **zero** for both scenarios**.** Likewise, the estimated number of fatalities during the 35-year operations term was also **zero** and is well below the less than 1 percent chance of a red knot population decline that was used by USFWS to conclude that take as defined under the ESA as killing or injuring, of red knots is not likely resulting from permitted fishing activities (e.g., U.S. Fish and Wildlife Service Evaluation of the Atlantic States Marine Fisheries Commission Horseshoe Crab-Red Knot Adaptive Resource Management Revision | FWS.gov). Therefore, based on the above findings, the likelihood of collision fatalities resulting from the Proposed Action would be unlikely to occur (*discountable*) and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*).

Table 8. Annual model outputs. Values greater than one are in bold. (See Appendix B for detailed model results).

Scenario	Species	Band Fatalities	SCRAM Probability of collision [a]	SCRAM Collisions [b] (95% CI)
16-meter gap	Piping Plover	NA	< 0.001	0.004 (0.003–0.007)
	Red Knot	0	< 0.001	0.006 (0.004–0.020)
	Roseate Tern	0	< 0.001	0.037 (0.018–0.077)
44-meter gap	Piping Plover		< 0.001	0.006 (0.004–0.010)
	Red Knot	0	< 0.001	0.007 (0.004–0.024)
	Roseate Tern	0	< 0.001	0.004 (0.004–0.004)

[a] SCRAM report, SCRAM run details, p. 2
[b] SCRAM report, Table 8

Table 9. Life of project (35 years) - Extrapolated from model outputs. Values greater than one are in bold

Scenario	Species	Band Fatalities	SCRAM Probability of collision [a]	SCRAM Collisions [b] (95% CI)
16-meter gap	Piping Plover	NA	0.034	0.140 (0.105–0.245)
	Red Knot	NA	0.034	0.210 (0.140–0.700)
	Roseate Tern	NA	0.034	**1.300** (0.630–2.700)
44-meter gap	Piping Plover	NA	0.034	0.210 (0.140–0.840)
	Red Knot	NA	0.034	0.245 (0.132–0.528)
	Roseate Tern	NA	0.034	0.140 (0.140–0.140)

[a] Probability of collision = 1-(1-0.001)$^{35\ years}$
[b] Collisions $_{project}$ = Collisions $_{annual}$ X 35 years

5.2.2 Noise

Federally listed bird species present within the Action Area may be exposed to periodic construction noise exceeding ambient levels due to construction of offshore wind structure foundations, construction of onshore Project elements, and use of construction vessels/vehicles. Combined with the visual disturbance created by construction activity, this exposure could theoretically lead to behavioral effects, including potential species avoidance of the affected area. There are currently no established in-air noise exposure thresholds for the federally listed birds analyzed in this BA, so potential species effects are evaluated based on extent and magnitude of effects relative to baseline ambient conditions and the likelihood of species exposure.

Project construction vehicle use would not significantly alter baseline noise levels because the Onshore Project area is highly developed. Additionally, Mayflower Wind is requiring construction equipment to be operated such that the construction-related noise levels comply with applicable sections of the MassDEP Air Quality Regulation at 310 CMR 7.10. Normal operation of the substation and converter station would generate continuous noise, but BOEM expects negligible long-term impacts when considered in the context of the other commercial and industrial noises near the proposed sites. ESA-listed birds near the offshore export cable landfall sites may be able to detect noise and visual disturbance created by construction and maintenance vehicles and associated activity, but that disturbance likely would be insignificant relative to existing baseline conditions. Species responses may range from escape behavior to mild annoyance. Offshore pile-driving noise impacts would be short term (2 hours per pin pile with a maximum of eight per day or 4 hours per monopile with a maximum of two per day) and soft starts will be used to mitigate impacts. Vessel and construction noise could disturb offshore bird species, but they would likely acclimate to the noise or move away, potentially resulting in a temporary loss of habitat (BOEM 2012). Construction and maintenance vehicle activity would also not significantly increase or alter the existing levels of disturbance within onshore areas; therefore, any noise-related effects on federally listed bird species in the vicinity would be temporary and localized.

Installation of offshore WTG and OSS foundations using an impact pile driver would produce the loudest airborne noise effects associated with the proposed Projects. The area potentially affected by pile driving at any given time would be limited to the effect radius around the pile being installed. The effect radius depends on the sea-surface and atmospheric parameters and mitigation to attenuate the noise. *rufa* red knot and piping plover would only be exposed to impact hammer noise if monopile installation occurs during the migratory period and if the species happened to be present as far offshore as the Lease Area when pile driving is occurring. Roseate terns are most likely to be exposed during the summer post-breeding foraging period and fall migration. Based on observed flight behavior, migrating birds would be able to detect and avoid noise-producing activities at a considerable distance with a minimal shift in flight path. Individual birds may hear Project construction noise, including pile driving, but would be able to limit exposure without significantly altering behavior. This conclusion is supported by the fact that these species are periodically exposed to elevated baseline noise levels from sources like large ships without apparent harm. Once construction is completed, the WTGs would produce operational airborne noise in the offshore marine environment, which also would have no impacts on federally listed birds.

It is expected that noise levels associated with decommissioning activities would be similar in scope, nature, and intensity to noise impacts associated with pile driving and construction, as described above. Similarly, noise impacts resulting from decommissioning would be localized and temporary, lasting only for the duration of structure removal. If these activities were to occur during the migration period, most *rufa* red knots and piping plovers, if even present in the area, would be flying well above the Action Area. However, should any federally listed birds occur in the area, they would simply fly around the noise source; therefore, the noise generated is not anticipated to affect bird movement or behavior through the Action Area.

Collectively, this information indicates that occurrence of federally listed birds in the offshore portions of the Action Area is expected but in very small numbers; therefore, exposure to noise would be minimal. In the onshore Action Area, federally listed birds could be present primarily in the offshore export cable landing areas. Onshore noise would be temporary, lasting only the duration of construction, maintenance, or decommissioning, and any noise related to the Project would not be anticipated to affect baseline noise conditions given the developed condition of the onshore Action Area. Furthermore, Mayflower Wind would implement measures to avoid and minimize bird impacts, including coordinating with MassWildlife, RIDEM, and USFWS to identify appropriate mitigation measures. Therefore, potential effects from noise may affect the roseate tern, piping plover, and *rufa* red knot, but adverse impacts would be unlikely to occur (*discountable*) and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*).

5.2.3 Land Disturbance

Roseate terns, piping plovers, and *rufa* red knots are not known to nest at the potential landfall sites. However, one pair of piping plovers was recently recorded at Surf Drive in Falmouth, which is in the vicinity of the Shore Street landfall site under consideration for the Proposed Action, and piping plovers and roseate terns have been identified by Massachusetts NHESP as potentially occurring in the Falmouth onshore Action Areas, and RIDEM has identified the piping plover as potentially occurring in the Brayton Point onshore Action Areas. Collectively, all three species have also all been identified within the vicinity of the Proposed Action (eBird 2023). Land disturbance could affect federally listed birds if they were to occur in the vicinity of the onshore Project elements during construction, maintenance, and decommissioning. Habitat disturbance with construction at the landfall sites could adversely affect habitats and disturb individuals of any three species if performed at times of year that the birds are typically present. Piping plovers, which could nest in the area, would be especially sensitive to disturbance. The presence of humans is stressful for adults and chicks, forcing them to spend significantly less time foraging, which may result in decreased overall reproductive success. Excessive disturbance may cause piping plovers to desert the nest, exposing eggs or chicks to the summer sun and predators. Interrupted feedings may stress juvenile birds during critical periods in their development, and foot and vehicle traffic may crush eggs or chicks (USFWS 1996). USFWS (2019a) reports that activities within 1 mile (1.6 kilometers) of a beach, dune, or intertidal area may affect piping plovers. These activities include any permanent or temporary increases in disturbance between March 15 and August 31, including but not limited to major construction work.

However, the onshore export cable installation is unlikely to disturb coastal habitat at the landfall sites due to the use of HDD methods to make the offshore to onshore transition which will primarily go under beaches and would avoid beach habitat for nesting shorebirds. Additionally, there is potential for collisions between birds and vehicles or construction equipment. However, these temporary impacts, if any, would be negligible, as most individuals would avoid noisy construction areas (Bayne et al. 2008; Goodwin and Shriver 2010; McLaughlin and Kunc 2013).

Any disturbances associated with construction will be for a short duration and limited to the daytime hours. Whenever possible, facilities (including overhead transmission lines) would be co-located with existing developed areas to limit disturbance. The Falmouth onshore cable routes would be installed to the greatest extent feasible within the disturbed road ROW, with the result that most impacts on natural communities would be avoided. Tree and vegetation clearing would be less than 0.5 acre (0.2 hectare) for each of the onshore export cables route options (COP Volume 2, Section 6.3.1.1.2; Mayflower Wind 2022). The maximum footprint of the substation would be up to 26 acres (10.5 hectares), mostly comprised of disturbed land that provides minimal habitat value. Within the Brayton Point export cable corridor, export cables would come ashore for the intermediate landfall on Aquidneck Island. HDD would be used to enter and exit Aquidneck Island to avoid potential impacts on nearby tidal zones, eelgrass zones, coastal dunes, and public beaches. A 3-mile (4.8-kilometer) underground onshore export cable,

using one of three potential routes, would cross the island using existing roadways where feasible, which would minimize the potential impacts on vegetation communities. At Brayton Point, the export cables would connect to the 7.5-acre site of the HVDC converter station, which is mostly comprised of developed and disturbed land with minimal habitat value. Both proposed onshore cable routes and converter station/substation site do not provide potentially suitable habitat for foraging roseate terns, piping plovers, and *rufa* red knots. Furthermore, Mayflower Wind will site the proposed Project to avoid locating Project components in or near areas of known important or high bird use (e.g., nesting, foraging and overwintering areas, migratory staging or resting areas), incorporate use of HDD at landfall locations to avoid disturbance to shorelines and coastal habitats to the extent practicable, and coordinate with MassWildlife, RIDEM, and USFWS to identify appropriate mitigation measures Therefore, potential effects from land disturbance 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*).

5.2.4 Cable Emplacement and Maintenance

Seafloor disturbance resulting from cable emplacement and maintenance would not affect piping plovers and *rufa* red knots, as these species are strictly terrestrial foragers and do not use aquatic habitats for foraging. While disturbance to individual foraging roseate tern may occur as a result of offshore export cable installation in appropriate habitat, the disturbance is not expected to be different from typical construction equipment (barges and/or dredges) and cable emplacement and maintenance will not adversely affect roseate terns (USFWS 2008). The potential impacts relate to temporary seabed and water column disturbance that could alter forage fish behavior and potentially affect foraging efficiency.

The disturbance to foraging roseate terns during their migration from July to mid-September could occur as a result of offshore export cable installation. The installation of array cables and offshore export cables would include site preparation activities (e.g., boulder removal) and cable installation via jetting (primary method), plowing, trenching, and dredging, which can cause temporary increases in turbidity and sediment resuspension. Other projects using similar installation methods have been characterized as having minor impacts on water quality due to the temporary and localized nature of the disturbance (Latham et al. 2017). A sediment transport model was conducted for the Proposed Action which showed impacts are expected to be temporary, with sediments settling quickly to the seabed and potential plumes generally confined to just above the seabed. The maximum total suspended solid (TSS) level would drop below 10 mg/l (0.00008 lb/gal) within 2 hours for all simulated scenarios and drop below 1 mg/l (0.000008 lb/gal) within 4 hours for any scenario except for nearshore areas of the Brayton Point corridor where 100 mg/L and 10 mg/L concentrations would last for less than 5 hours and a little over 2 days, respectively (Mayflower Wind 2022). Dredging, which may also occur along the proposed cable routes in locations where sand waves (naturally mobile slopes on the seabed) are encountered or when crossing federal and state navigation channels, would produce similar effects, but with plumes likely to last longer and extend farther out

Impacts on benthic habitats and increased turbidity during cable-laying activities have the potential to affect sand lance, an important prey resource for roseate terns (USFWS 2008). Given the nature of the construction techniques, indirect impacts such as increased turbidity would be temporary in duration and localized in nature and would not directly affect terns because the activity would be underwater. It is estimated that water turbidity conditions would return to normal within a few hours of cable installation. Also, this disturbance is not expected to be different from typical construction equipment (barges or dredges) and cable installation, which are not believed to adversely affect roseate terns (USFWS 2008). Furthermore, as previously described in this BA, few (if any) roseate terns would be expected in the offshore Action Area. Therefore, because turbidity impacts would be temporary and last only a few hours, and because few, if any, roseate terns are expected to be in the offshore Action Area, potential effects on prey resources that relate to cable emplacement and maintenance 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*).

5.2.5 Lighting

Under the Proposed Action, WTGs and OSS would be lit with USCG navigational and FAA hazard lighting; these lights have some potential to attract birds and result in increased collision risk (Hüppop et al. 2006). Under poor visibility conditions (fog and rain), some migrating birds may become disoriented and circle lighted communication towers instead of continuing on their migratory path, greatly increasing their risk of collision (Hüppop et al. 2006). Tower lighting would have the greatest impact on bird species during evening hours when nocturnal migration occurs. In accordance with BOEM lighting guidelines (BOEM 2021) and as outlined in Mayflower Wind COP Volume 1, Section 3.3.12 (Mayflower Wind 2022), each WTG and OSP would be lit and marked in accordance with FAA and USCG lighting standards and consistent with BOEM best practices. Lighting would be placed on all structures and would be visible throughout a 360-degree arc from the surface of the water. Mayflower Wind would implement an ADLS to only activate WTG lighting when aircraft enter a predefined airspace. The short-duration synchronized flashing of the ADLS would have less impact on birds at night than the standard continuous, medium-intensity red strobe light aircraft warning systems. ADLS for the Proposed Action is anticipated to be activated for less than 5 hours per year, or 0.1 percent of nighttime hours, compared to standard continuous FAA hazard lighting (COP, Appendix T, Section 5.1.3; Mayflower Wind 2022). This would reduce impacts already associated with WTG lighting. Vessel lights during construction, O&M, and decommissioning would be minimal and likely limited to vessels transiting to and from construction areas. To further reduce impacts on birds, Mayflower Wind will minimize lighting, to the extent practicable, to reduce potential attraction of birds to vessels during construction activities (COP Volume 2, Table 16-1; Mayflower Wind 2022).

As previously described in this BA, the occurrence of federally listed birds in the offshore portions of the Action Area is expected in very small numbers; therefore, exposure to lighting may affect the roseate tern, piping plover, and *rufa* red knot but is not likely to adversely affect these species. In addition, Mayflower Wind's lighting mitigation measures would further minimize potential exposure to lighting. Therefore, because few, if any, federally listed birds are expected to be in the offshore Action Area and Mayflower Wind has committed to lighting reduction measures, potential effects from lighting-related collision 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*).

5.2.6 Traffic (Aircraft)

Aircraft traffic during construction, O&M, and decommissioning could pose a collision threat to federally listed birds that may be in the area of aircraft use. General aviation traffic accounts for approximately two bird strikes per 100,000 flights (Dolbeer et al. 2019). Because aircraft flights associated with the Project are expected to be minimal in comparison to baseline conditions, aircraft strikes with federally listed birds are highly unlikely to occur. Aircraft use is primarily expected during construction and decommissioning activities to transport crew and equipment to and from the Lease Area. In addition, as previously described in this BA, the occurrence of federally listed birds in the offshore portions of the Action Area expected in very small numbers. Therefore, potential effects from aircraft-related 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*).

5.2.7 Accidental Releases

Roseate tern is the only federally listed species considered in this BA with the potential to be affected by accidental releases in the offshore environment. Accidental releases would not affect piping plovers or

rufa red knots, as these species are strictly terrestrial foragers and do not use aquatic habitats for foraging and resting on the water.

Some potential exists for bird mortality, decreased fitness, and health effects due to the accidental release of fuel, hazardous materials, and trash and debris from vessels associated with construction, O&M, and decommissioning of the offshore Project elements. Ingestion of fuel and other hazardous contaminants has the potential to result in lethal and sublethal impacts on birds, including decreased hematological function, dehydration, drowning, hypothermia, starvation, and weight loss (Briggs et al. 1997; Haney et al. 2017; Paruk et al. 2016). Additionally, even small exposures that result in oiling of feathers can lead to sublethal effects that include changes in flight efficiencies and result in increased energy expenditure during daily and seasonal activities, including chick provisioning, commuting, courtship, foraging, long-distance migration, predator evasion, and territory defense (Maggini et al. 2017). Vessels associated with the Proposed Action may potentially generate operational waste, including bilge and ballast water, sanitary and domestic wastes, and trash and debris. BOEM expects accidental trash releases from offshore vessels to be rare and localized in nature. In the unlikely event of a release, lethal and sublethal impacts on individuals could occur as a result of blockages caused by both hard and soft plastic debris (Roman et al. 2019).

USGS regulations and operating procedures would minimize effects on offshore bird species resulting from the release of debris, fuel, hazardous materials, or waste (BOEM 2012). In the case of an accidental spill within the proposed Project Area, Mayflower Wind will use an approved OSRP mitigation measures to prevent birds from going to affected areas including hazing, chumming, and relocating to unaffected areas These releases, if any, would occur infrequently at discrete locations and vary widely in space and time; as such, BOEM expects localized and short-term impacts on roseate tern.

As previously described in this BA, the occurrence of roseate terns in the offshore portions of the Action Area is expected in very small numbers; therefore, exposure to accidental releases would be minimal. In addition, any release is anticipated to be rare and localized, and USCG regulations and Mayflower Wind's OSPR would further minimize potential exposure to accidental releases. Therefore, potential effects of accidental releases 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*).

5.2.8 Avoidance, Minimization, and Mitigation Measures

The COP, Volume 2, Table 16-1 (Mayflower Wind 2022) provides a list of APMs to avoid, minimize, or mitigate impacts and to perform monitoring of potential impacts. Several APMs identified for birds would be beneficial to federally listed birds:

- Mayflower Wind sited/located development activities in disturbed areas with minimal wildlife habitat. Notably, no shorebird nesting areas have been identified in any of the nearshore work areas in Falmouth and at Brayton Point. While two osprey nests were identified in close proximity to the onshore cable route variants in Portsmouth, Rhode Island, Mayflower Wind does not anticipate any impacts to the two nesting pairs of ospreys. Should an unforeseen conflict arise, Mayflower Wind will coordinate with RIDEM, MA DFW, RI CRMC, and USFWS to identify appropriate mitigation measures, if required.
- Siting the proposed Project to avoid locating Project components in or near areas of known important or high bird use (e.g., nesting, foraging and overwintering areas, migratory staging or resting areas).
- Incorporate use of HDD at landfall locations to avoid disturbance to shorelines and coastal habitats to the extent practicable.
- Coordinate with MassWildlife, RIDEM, and USFWS to identify appropriate mitigation measures.

- Minimize lighting, to the extent practicable, to reduce potential attraction of birds to vessels during construction activities.
- Use approved OSRP mitigation measures, as necessary, to prevent birds from going to affected areas including chumming, hazing, and relocating to unaffected areas.
- Develop and implement a Post-Construction Monitoring Plan.
- Ensure that lighting on WTGs will be executed in accordance with FAA regulations.
- Lighting on OSPs will be minimized to that required for navigation safety to reduce potential attraction of birds to the extent practicable.

Mayflower Wind has proposed numerous other APMs for Terrestrial Vegetation and Wildlife, several of which could also serve to conserve birds and their habitat.

- Mayflower Wind will site Project components to avoid locating onshore facilities and landfall sites in or near significant fish and wildlife habitats to the greatest extent practicable. The proposed onshore substation site and the converter station site will be constructed in primarily open, developed areas.
- Mayflower Wind will train construction staff on biodiversity management and environmental compliance requirements.
- An environmental compliance monitor will be hired to provide oversight of terrestrial construction activities.
- Mayflower Wind will bury the onshore export cables underground beneath local roadways from landfall to the onshore substation site.
- If tree clearing is required, Mayflower Wind will conduct habitat assessments and presence/absence surveys and will coordinate with MassWildlife, RIDEM, and USFWS as appropriate.
- Mayflower Wind will, to the extent practicable, conduct construction activities outside of periods when highly sensitive species are likely to be present.
- Mayflower Wind will implement erosion and sediment control measures in areas adjacent to water resources, such as wetlands, ponds, and other waterbodies, or in areas with significant grades that would make them prone to erosion.
- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will ensure lighting will be minimized to the extent practicable to reduce potential displacement or attraction of wildlife species to Project sites during construction activities within the Project area.
- Vehicle speed limits will be enforced at all Project sites to minimize potential for vehicle collisions with wildlife.
- Mayflower Wind will conduct presence/absence surveys; surveys for protected plant and wildlife species will be completed as needed to inform the detailed engineering and design of the Project facilities.
- Mayflower Wind will ensure that standard construction BMPs (including erosion and sediment control measures) will be implemented to avoid dewatering discharge scour and siltation to nearby receiving waters, including wetlands.
- Mayflower Wind will implement a construction-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.

- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement an operations-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.
- Mayflower Wind will implement a Vegetation Management Plan approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement erosion and sediment control measures in accordance with applicable regulations.
- Mayflower Wind will prepare a Construction Management Plan (CMP) to guide contractors during construction and ensure that environmental protection and sound construction practices are implemented throughout construction. The CMP will reflect permitting updates and include commitments made during environmental reviews and permitting processes as well as permit conditions. The CMP will outline feasible measures that will be implemented to eliminate or minimize impacts including, but not limited to, traffic management, soil management, air quality, noise, water quality, erosion and sedimentation, solid waste management, soil management, spill control, and archaeological resources. The CMP will include Best Management Practices (BMPs) to minimize construction period environmental impacts.

As stated in Section 5.1.4 of this BA, Mayflower Wind has developed the draft Framework) to outline Mayflower Wind's approach to post-construction avian and bat monitoring, overarching monitoring objectives, proposed monitoring elements, and reporting requirements. The Framework pertains to the offshore portions of the Action Area within the Lease Area only and does not apply to offshore export cables, cable landfall sites, or onshore portion of the Project. A detailed *Avian and Bat Post-Construction Monitoring Plan* (Monitoring Plan), based on this Framework, will be developed in coordination with BOEM, USFWS, and other relevant regulatory agencies as the NEPA process for the Project progresses. See Table 7 in this BA for the proposed avian and bat monitoring objectives and methods.

Mayflower Wind plans to install offshore automated telemetry receiving stations (Motus receivers) and contribute funding to radio-tagging efforts to gain a better understanding of the presence and movements of ESA-listed birds within the Lease Area. The Motus receivers will also provide opportunistic presence/absence data on other species with Motus tags including songbirds and bats. The exact species to be studied will be further determine in consultation with federal agencies and will depend on existing, ongoing field efforts. The movements of the radio-tagged ESA-listed birds within the vicinity of the Lease Area will be monitored for up to three years post-construction, during the spring, summer, and fall. Motus receivers will be installed within the Lease Area and the specific number and location of offshore receiver stations will be further selected in accordance with research needs. Mayflower Wind will coordinate with USFWS to determine the appropriate funding and support to be provided to researchers working with ESA-listed birds. The ESA-listed bird presence/absence within the Lease Area will be analyzed by comparing detections within the Lease Area to coastal receiver towers. All detections can be analyzed to understand relationships with time of day, season, and weather.

Mayflower Wind further plans to monitor nocturnal migrants. Similar to other MA/RI WEA offshore wind projects, Mayflower Wind is considering conducting a 1-to-2-year radar study to record the passage rates (flux) of migrants and their flight heights. Specific radar system(s), location, time of year, and methodology will be determined in consultation with USFWS closer to the commencement of Project operations. The results of such radar monitoring could be related to time of year and weather conditions, to increase the understanding on when nocturnal migrants may have higher collision risk.

A radar study will be conducted to examine marine bird avoidance. Mayflower Wind is considering conducting up to two years of radar study to collect data on macro (and potentially meso) avoidance rates.

The radar would run continuously to collect data at times when birds vulnerable to displacement are present. Furthermore, the data on macro-avoidance would support understandings of both displacement and collision vulnerability.

Furthermore, Mayflower Wind plans to implement a reporting system to document dead or injured birds found incidentally on vessels and offshore Project structures during construction, operation, and decommissioning. The location will be marked using GPS, an Incident Reporting Form will be filled out, and digital photographs will be taken. Animals detected that could be ESA-listed will be identified by consulting biologists, and a report will be further submitted to designated staff at Mayflower Wind who will then report it to BOEM, USFWS, and other relevant regulatory agencies. Carcasses with federal or research bands or tags will be reported to the USGS Bird Band Laboratory at https://www.pwrc.usgs.gov/bbl/.

Over the course of monitoring, Mayflower Wind additionally plans to work with BOEM, USFWS, MassWildlife, RIDEM, and other relevant regulatory agencies to determine the need for adjustments to monitoring approached, consideration of new monitoring technologies, and/or additional periods of monitoring based on an ongoing assessment of monitoring results. The potential triggers for adaptive monitoring may include, but are not limited to, equipment failure, an unexpected impact to bats or birds identified through monitoring, or new opportunities to collaborate with other projects in the region. The Monitoring Plan will include a series of potential adaptive monitoring actions, developed in coordination with BOEM, USFWS, and other relevant regulatory agencies. Additionally, Mayflower Wind will submit an annual Monitoring Report to BOEM summarizing post-construction monitoring activities, preliminary results as available, and any proposed changes in the monitoring program. Mayflower Wind will consult with BOEM and USFWS, as necessary, to discuss the report and adaptive changes to the Monitoring Plan.

As part of efforts to ensure that the Nation's development of energy resources on the OCS are done in a manner protective of the natural environment, BOEM will identify conditions for the Lessee to abide by as they pertain to protected species and habitat. BOEM's conditions will likely be similar to those described in previous consultations with South Fork Wind and Vineyard Wind (BOEM 2022a, 2021). These measures may include:

- Bird-Deterrent Devices used during construction and operation. To minimize attracting birds to operating turbines, the Lessee must install bird-deterrent devices on all turbines and the OSS. The location of bird-deterrent devices must be proposed by the Lessee based on best management practices applicable to the appropriate operation and safe installation of the devices. The Lessee must confirm the locations of bird-deterrent devices as part of the as-built documentation it must submit with the FDR.
- Annual Bird Mortality Reporting during construction and operation, and decommissioning. The Lessee must submit an annual report covering each calendar year, due by January 31 of the following year, documenting any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. The report must be submitted to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWSubmittals@bsee.gov) and USFWS. The report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with Federal or research bands must be reported to the United States Geological Survey Bird Band Laboratory. Any occurrence of dead ESA birds or bats must be reported to BOEM, BSEE, and USFWS as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting, and if practicable, carefully collect the dead specimen and preserve the material in the best possible state.

- The development of an avian and bat monitoring program during construction and operation. At least 45 calendar days before beginning surveys, the Lessee must complete, obtain concurrence from DOI, and adopt an Avian and Bat Monitoring Plan, including coordination with interested stakeholders. DOI will review the Avian and Bat Monitoring Plan and provide any comments on the plan within 30 calendar days of its submittal. The Lessee must resolve all comments on the Avian and Bat Monitoring Plan to DOI's satisfaction before implementing the plan. The Lessee may conclude that DOI has concurred in the Avian and Bat Monitoring Plan if DOI provides no comments on the plan within 30 calendar days of its submittal date. Under this condition the Lessee must allow for:

    1. Monitoring. The installation of acoustic monitoring devices for birds and bats; installation of Motus receivers on WTGs in the WDA and support with upgrades or maintenance of x onshore Motus receivers; up to x Motus tags per year for up to x years to track Roseate Terns, Common Terns, and/or nocturnal passerine migrants; pre- and post-construction boat surveys; and avian behavior point count surveys at the boat-based survey vessel or from turbine platforms.
    2. Annual Monitoring Reports. The Lessee must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWSubmittals@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within 6 months of completion of the last avian survey. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. DOI will use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the Avian and Bat Monitoring Plan. DOI reserves the right to require reasonable revisions to the Avian and Bat Monitoring Plan and may require new technologies as they become available for use in offshore environments.
    3. Post-Construction Quarterly Progress Reports. The Lessee must submit quarterly progress reports during the implementation of the Avian and Bat Monitoring Plan to BOEM (at renewable_reporting@boem.gov) and the United States Fish and Wildlife Service (USFWS) by the 15th day of the month following the end of each quarter during the first full year that the Project is operational. The progress reports must include a summary of all work performed, an explanation of overall progress, and any technical problems encountered.
    4. Monitoring Plan Revisions. Within 15 calendar days of submitting the annual monitoring report, the Lessee must meet with BOEM and USFWS to discuss the following: the monitoring results; the potential need for revisions to the Avian and Bat Monitoring Plan, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If DOI determines after this discussion that revisions to the Avian and Bat Monitoring Plan are necessary, DOI may require the Lessee to modify the Avian and Bat Monitoring Plan. If the reported monitoring results deviate substantially from the impact analysis included in the FEIS, the Lessee must transmit to DOI recommendations for new mitigation measures or monitoring methods.
    5. Raw Data. The Lessee must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to DOI and USFWS, upon request for the duration of the Lease. The Lessee must work with BOEM to ensure the data are publicly available.

5.3 Monarch Butterfly

Potential IPFs from the construction, operation, and decommissioning of the proposed Project on monarch butterfly include presence of structures and land disturbance.

5.3.1 Presence of Structures

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. This would be a small proportion of the overall migratory population, and large numbers of monarch butterflies do not fly over the Atlantic OCS.

There is limited information about butterfly mortalities caused by collisions with WTGs, especially for monarch butterflies in the offshore environment. Some studies have investigated the density of insect splatter on onshore WTG blades and concluded that there was a negligible effect on insects (Gipe 1995), while others have suggested that the impacts of WTGs on insect populations, in general, may be significant (Trieb 2018; Voigt 2021). Monarch butterfly migration is well studied, and the species has been recorded to fly at heights over 10,000 feet (3,048 meters) above ground elevation, taking advantage of favorable winds and moving downwind at high elevation (Monarch Joint Venture 2014). Therefore, while their flight patterns could occasionally put them within the blade heights of WTGs, monarch butterflies would be unlikely to occur within the RSZ of the Project during migration. They are also believed to generally be capable of avoiding WTGs due to their high-altitude migration (Monarch Joint Venture 2021). Because migration is the only time period when monarch butterflies could occur offshore, there is little to no evidence to suggest that collision with WTGs on the Atlantic OCS poses a threat to the species. Therefore, because the occurrence of monarch butterflies in the offshore portions of the Action Area is anticipated to be very rare and they migrate at higher elevations than the RSZ, potential collisions with structures 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*).

5.3.2 Land Disturbance

Impacts associated with the construction and maintenance of onshore elements of the Proposed Action include displacement of direct injury or death of monarch butterflies in the onshore Action Area through converter station/substation construction and routine ground maintenance in the vicinity of milkweed and other native nectar plants. While adult monarch butterflies have the mobility to avoid construction equipment, larval stages could be vulnerable to being crushed by construction equipment, particularly during land clearing and ground excavation. Some adult monarch butterflies could also be affected by vehicle collisions (McKenna et al. 2001; Kantola et al. 2019). Additionally, there is limited evidence that monarch caterpillars exposed to highway noise for short periods had elevated heart rates, a sign that they may experience stress along loud roadsides (Davis et al. 2018).

As stated above, routine ground disturbance is likely to occur during O&M near the onshore converter station/substation. Routine ground disturbance would result in permanent alteration of natural habitats, which were disturbed prior during the construction phase. If milkweed or other native nectar plants were present within the lease boundary (50 feet [15.2 meters] of the converter station/substation and 35 feet [10.7 meters] along the cable corridor), monarch butterflies may be displaced from the loss of suitable habitat.

Although Project construction, operation, and decommissioning could potentially affect a small number of monarch butterflies, impacts are anticipated to be limited to behavioral avoidance of construction activity, and collision with Project vehicles and equipment is unlikely because the Project would not cause a noticeable increase in traffic. The likelihood that portions of the onshore Action Areas may serve as suitable habitat for monarch butterflies is very low or low for a majority of the Falmouth onshore Action Area, as well as the Brayton Point onshore Action Area. However, purple milkweed was identified as potentially occurring in the onshore Action Areas and is a species of milkweed known to attract monarch butterflies (USDA n.d.) and an existing population of purple milkweed has been discovered in

Falmouth, Massachusetts (Farnsworth and DiGregorio 2001). Surveys completed within the Camp Edwards area, located near onshore Project features in Falmouth, have identified common milkweed and this species has been further identified as a common plant of Camp Edwards.

If any adult butterflies were disturbed by Project activities, they would likely utilize adjacent habitat and repopulate these areas once construction ceases. Furthermore, Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources, enforce vehicle speed limits at all Project sites to minimize potential for vehicle collisions with wildlife, and conduct presence/absence surveys; surveys for protected plant and wildlife will be completed as needed to inform the detailed engineering and design of the Project facilities. If suitable monarch butterfly habitat is present where the converter station/substation construction would occur, or the routine ground maintenance, the small permanent loss of habitat would be considered insignificant and population-level effects are unlikely to occur. Based on this information, potential effects on monarch butterflies from land disturbance and related activities (e.g., construction vehicle use) would be unlikely to occur (*discountable*), and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*).

5.3.3 Avoidance, Minimization, and Mitigation Measures

No APMs are specifically focused on the monarch butterfly in the COP Volume 2, Table 16-1 (Mayflower Wind 2022). But several APMs identified for terrestrial vegetation and wildlife could serve to reduce potential Project effects on this species and include:

- In accordance with Rhode Island Natural Heritage Program (RINHP) policy, the occurrence (if any) of butterfly milkweed (Asclepias tuberosa) within the onshore export cable work areas on Aquidneck Island will be reported to the RINHP during the state permitting process. Butterfly milkweed, a Rhode Island state species of concern, has showy orange flowers in umbels and occurs within disturbed habitats, grassland, meadows, and fields. As with other milkweed species, this plant provides important food sources for the larval form of butterfly species, including the monarch butterfly (*Danaus plexippus*), which is a candidate species under the federal ESA (Monarch Joint Venture 2019; USFWS 2019b).
- Mayflower Wind will site Project components to avoid locating onshore facilities and landfall sites in or near significant fish and wildlife habitats to the greatest extent practicable. The proposed onshore substation site and the converter station site will be constructed in primarily open, developed areas.
- Mayflower Wind will train construction staff on biodiversity management and environmental compliance requirements.
- An environmental compliance monitor will be hired to provide oversight of terrestrial construction activities.
- Mayflower Wind will bury the onshore export cables underground beneath local roadways from landfall to the onshore substation site.
- If tree clearing is required, Mayflower Wind will conduct habitat assessments and presence/absence surveys and will coordinate with MassWildlife, RIDEM, and USFWS as appropriate.
- Mayflower Wind will, to the extent practicable, conduct construction activities outside of periods when highly sensitive species are likely to be present.
- Mayflower Wind will implement erosion and sediment control measures in areas adjacent to water resources, such as wetlands, ponds, and other waterbodies, or in areas with significant grades that would make them prone to erosion.

- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will ensure lighting will be minimized to the extent practicable to reduce potential displacement or attraction of wildlife species to Project sites during construction activities within the Project Area.
- Vehicle speed limits will be enforced at all Project sites to minimize potential for vehicle collisions with wildlife.
- Mayflower Wind will conduct presence/absence surveys; surveys for protected plant and wildlife species will be completed as needed to inform the detailed engineering and design of the Project facilities.
- Mayflower Wind will ensure that standard construction BMPs (including erosion and sediment control measures) will be implemented to avoid dewatering discharge scour and siltation to nearby receiving waters, including wetlands.
- Mayflower Wind will implement a construction-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.
- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement an operations-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.
- Mayflower Wind will implement a Vegetation Management Plan approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement erosion and sediment control measures in accordance with applicable regulations.
- Mayflower Wind will prepare a Construction Management Plan (CMP) to guide contractors during construction and ensure that environmental protection and sound construction practices are implemented throughout construction. The CMP will reflect permitting updates and include commitments made during environmental reviews and permitting processes as well as permit conditions. The CMP will outline feasible measures that will be implemented to eliminate or minimize impacts including, but not limited to, traffic management, soil management, air quality, noise, water quality, erosion and sedimentation, solid waste management, soil management, spill control, and archaeological resources. The CMP will include Best Management Practices (BMPs) to minimize construction period environmental impacts.

5.4 Sandplain Gerardia

The potential IPF from the construction, operation, and decommissioning of the proposed Project on sandplain gerardia includes land disturbance.

5.4.1 Land Disturbance

Land disturbance could affect sandplain gerardia if this plant were to occur in the vicinity of the Falmouth onshore Project elements during construction, maintenance, and decommissioning. Habitat disturbance with onshore construction could adversely affect habitats and disturb plants (damage or crushing) if performed at times of year they are present. To limit land disturbance whenever possible, Mayflower Wind would co-locate facilities and onshore export cables with existing developed areas (i.e., roads and

existing transmission ROWs). By using the HDD to transition onshore, the impacts on beaches and nearshore vegetated natural habitats would be avoided for all options.

Potential effects from land disturbance 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*).

5.4.2 Avoidance, Minimization, and Mitigation Measures

No APMs are specifically focused on sandplain gerardia in the COP Volume 2, Table 16-1 (Mayflower Wind 2022). But several APMs identified for terrestrial vegetation and wildlife could serve to reduce potential Project effects on this species and include:

- The proposed onshore transmission cabling and converter stations are located predominantly in previously disturbed/developed road ROW and/or industrial land outside the current known distribution of sandplain gerardia; these locations do not contain suitable habitat for this species. Sandplain gerardia, with brilliant pink flowers, blooms from late August through late September and grows in dry sandy soils. The Falmouth population has lost habitat due to development and to trees and shrubs whose growth was formerly kept in check by fire or mowing.
- Mayflower Wind will site Project components to avoid locating onshore facilities and landfall sites in or near significant fish and wildlife habitats to the greatest extent practicable. The proposed onshore substation site and the converter station site will be constructed in primarily open, developed areas.
- Mayflower Wind will train construction staff on biodiversity management and environmental compliance requirements.
- An environmental compliance monitor will be hired to provide oversight of terrestrial construction activities.
- Mayflower Wind will bury the onshore export cables underground beneath local roadways from landfall to the onshore substation site.
- If tree clearing is required, Mayflower Wind will conduct habitat assessments and presence/absence surveys and will coordinate with MassWildlife, RIDEM, and USFWS as appropriate.
- Mayflower Wind will, to the extent practicable, conduct construction activities outside of periods when highly sensitive species are likely to be present.
- Mayflower Wind will implement erosion and sediment control measures in areas adjacent to water resources, such as wetlands, ponds, and other waterbodies, or in areas with significant grades that would make them prone to erosion.
- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will ensure lighting will be minimized to the extent practicable to reduce potential displacement or attraction of wildlife species to Project sites during construction activities within the Project area.
- Vehicle speed limits will be enforced at all Project sites to minimize potential for vehicle collisions with wildlife.
- Mayflower Wind will conduct presence/absence surveys; surveys for protected plant and wildlife species will be completed as needed to inform the detailed engineering and design of the Project facilities.

- Mayflower Wind will ensure that standard construction BMPs (including erosion and sediment control measures) will be implemented to avoid dewatering discharge scour and siltation to nearby receiving waters, including wetlands.
- Mayflower Wind will implement a construction-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.
- Mayflower Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement an operations-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials.
- Mayflower Wind will implement a Vegetation Management Plan approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources.
- Mayflower Wind will implement erosion and sediment control measures in accordance with applicable regulations.
- Mayflower Wind will prepare a Construction Management Plan (CMP) to guide contractors during construction and ensure that environmental protection and sound construction practices are implemented throughout construction. The CMP will reflect permitting updates and include commitments made during environmental reviews and permitting processes as well as permit conditions. The CMP will outline feasible measures that will be implemented to eliminate or minimize impacts including, but not limited to, traffic management, soil management, air quality, noise, water quality, erosion and sedimentation, solid waste management, soil management, spill control, and archaeological resources. The CMP will include Best Management Practices (BMPs) to minimize construction period environmental impacts.

6. Determination of Effect

6.1 Proposed Action

6.1.1 Bats (Northern Long-Eared Bat and Tricolored Bat)

Given that the northern long-eared bat occurs or potentially occurs in portions of the Action Area and, as described in Section 5, there is potential risk to the species during construction, O&M, and decommissioning, the proposed Project **may affect** the northern long-eared bat and the tricolored bat. However, because few (if any) northern long-eared bats or tricolored bats are expected in the onshore and offshore Action Areas, habitat is generally lacking onshore, and Mayflower Winds APMs would further avoid and minimize any impacts, the potential effects related to collisions from the presence of structures, noise, and land disturbance 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 northern long-eared bat or the tricolored bat.

6.1.2 Birds (Piping Plover, *Rufa* Red Knot, Roseate Tern)

Given that the piping plover, *rufa* red knot, and roseate tern occur or potentially occur in portions of the Action Area and, as described in Section 5, there is potential risk to the species during construction, O&M, and decommissioning, the proposed Project **may affect** these birds. However, the occurrence of these birds 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, With the exception of the roseate tern, these species do not have a high risk of collision with offshore WTGs and are rarely expected to occur within the RSZ. Any noise, accidental releases, traffic (aircraft), and cable emplacement and maintenance effects (roseate tern only) would be temporary and localized. The impacts from structure lighting would also be significantly minimized with Mayflower Wind's proposed avoidance, minimization, and mitigation measures including ensuring that lighting on the WGTs will be executed in accordance with FAA regulations, and lighting on OSPs will be minimized to that required for navigation safety to reduce potential attraction of birds to the extent practicable. To avoid and minimize potential impacts on the birds' habitat, Mayflower Wind will incorporate the use of HDD at landfall locations to avoid disturbance to shoreline and coastal habitats to the extent practicable; as such, impacts on these birds resulting from the landfall location would be avoided and minimized. 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 is **not likely to adversely affect** the piping plover, or the *rufa* red knot. In the case of the roseate tern, SCRAM model data suggests that fatalities of roseate terns due to collision with WTGs is *possible*, depending on the air-gap from the lower tip of the WTG blade and the water (Table 9). Given this possibility, BOEM anticipates that the Proposed Action is **likely to adversely affect** the roseate tern.

6.1.3 Monarch Butterfly

Given that the monarch butterfly occurs or potentially occurs in portions of the Action Area and, as described in Section 5, there is potential risk to the species during construction, O&M, and decommissioning, the proposed Project **may affect** the monarch butterfly. However, there is little to no evidence to suggest that collision with WTGs on the Atlantic OCS poses a threat to the monarch butterfly. In addition, collision risk with WTGs is unlikely because monarch butterflies are known to migrate at higher elevations that the RSZ. Based on the highly developed urban character of the majority of the onshore Action Area and the monarch butterfly's specific habitat preferences, and considering avoidance

measures and post-construction habitat restoration, any potential impacts, were they to occur, on the monarch butterfly would temporary and localized. Therefore, the 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*). Therefore, if USFWS were to list the monarch butterfly as threatened or endangered in the future, BOEM anticipates the Proposed Action is **not likely to adversely affect** the species.

6.1.4 Sandplain Gerardia

Given that sandplain gerardia occurs or potentially occurs in portions of the onshore Action Area in Falmouth, and as described in Section 5, there is potential risk to the species during construction, O&M, and decommissioning, the proposed Project **may affect** sandplain gerardia. However, based on the highly developed urban character of the majority of the onshore Action Area, any potential effects from land disturbance 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 sandplain gerardia.

6.2 Other Relevant Action Alternatives

BOEM considered four relevant action alternatives to the Proposed Action (Alternatives C through F in the EIS). The impact analyses, effects determinations, and conclusions for Alternatives D though F would not be materially different from those of the Proposed Action for the following reasons:

6.2.1 Alternatives D, E, and F

Impacts on the northern long-eared bat, tricolored bat, piping plover, roseate tern, *rufa* red knot, and monarch butterfly associated with construction and installation, O&M, and decommissioning of the Project under Alternatives D, E, and F would be similar to those described under the Proposed Action. Under Alternative D (Nantucket Shoals), potential impacts on birds from the presence of structures, noise, and light could be reduced with the removal of up to six WTGs in the northeastern portion of the Lease Area that are nearest to Nantucket Shoals. Roseate terns may forage or travel through the Wind Farm Area to adjacent foraging habitat in Nantucket Shoals. Veit et al. (2016) further identified hotspots of roseate tern abundance along the western side of the Nantucket Shoals The northeastern portion of the Lease Area may be frequented by all three bird species, and a reduction in offshore wind development in this area may lessen the impacts on these species. However, any such differences compared to the Proposed Action would likely be immeasurable. BOEM anticipates that potential impacts from Alternative D compared to the Proposed Action would not measurably change or be materially different.

Alternative E-1 would require all piled foundations, resulting in similar impacts from noise as the Proposed Action. Under Alternative E-2 and Alternative E-3, foundations would be used that require no impact pile driving (suction-bucket and GBS), eliminating impacts on diving birds due to underwater noise. Foundations with larger seabed footprints (Alternative E-3) may present increased foraging opportunities due to increased aggregations of fish near structures due to the presence of artificial reefs. BOEM anticipates that the impacts on birds under Alternatives E-1, E-2, and E-3 would not be materially different from those anticipated under the Proposed Action; thus, the effects determinations would remain **may affect, not likely to adversely affect** for all species considered, with the exception of the roseate tern, for which the determination would remain **likely to adversely affect.**

Under Alternative F, the Falmouth offshore export cable route would still be within the Proposed Action's PDE but would include only three cables compared to five cables under the Proposed Action, which would reduce seafloor disturbance by approximately 700 acres. Because the offshore export cable footprint would be the same or slightly less, BOEM does not anticipate impacts to be materially different

than those described under the Proposed Action, thus, the effects determinations would remain **may affect, not likely to adversely affect** for all species considered, with the exception of the roseate tern, for which the determination would remain **likely to adversely affect.**

7. Alternatives C-1 and C-2

Alternative C was developed through the scoping process for the Draft EIS in response to comments received from the National Marine Fisheries Service and other agencies expressing concern with the potential impact of the Offshore Export Cable on fisheries, Essential Fish Habitat (EFH), and Habitat Areas of Particular Concern (HAPC) in the Sakonnet River. The Sakonnet River supports EFH for 16 fish species and has HAPCs for Summer flounder and Atlantic Cod. To address this concern, BOEM developed onshore cable route options that would avoid placing the Offshore Export Cable in the Sakonnet River. Under this alternative, the construction, O&M, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters outlined in the Mayflower Wind COP, subject to applicable mitigation measures. BOEM worked with Mayflower Wind to identify feasible onshore cable routes to avoid the Sakonnet River and identified two onshore route alternatives (Figure 39).

As stated above in Section 2.4, under Alternative C, the construction, operations and maintenance, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters outlined in the Mayflower Wind COP, subject to applicable mitigation measures. However, the Project would include an Onshore Export Cable route that would avoid placing the Offshore Export Cable in the Sakonnet River to avoid impacts to fisheries habitats. Alternative C includes two possible Onshore Export Cable routes:

- **Alternative C-1:** Aquidneck Island, Rhode Island Route
- **Alternative C-2:** Little Compton/Tiverton, Rhode Island Route

7.1 Description of Alternatives C-1 and C-2 Action Area

Alternative C-1 runs the length of Aquidneck Island with two variations, but ultimately traveling along Route 138. Alternative C-1 would make landfall at the Second Beach parking lot in Middletown, Rhode Island, via HDD under the municipal public beach from Sachuest Bay. From the landfall, Alternative C-1 would proceed inland through Middletown via a western variation or eastern variation before reaching Route 138. From landfall, the western variation would proceed along Hanging Rock Road, Paradise Avenue, Berkley Avenue, Wyatt Road, Turner Road and Route 138 (to Mitchell's Lane; 4.1-mile [6.6-kilometer] total distance). The eastern variation would proceed along Hanging Rock Road, Third Beach Avenue, and Mitchell's Lane before reaching Route 138 (4-mile [6.4-kilometer] total distance). Both segments pass by wetlands, parks, and reserves, and both segments pass through Rhode Island Natural Heritage Areas. The eastern variation abuts more reserves and Natural Heritage Areas than the western variation. The roadways along the variants are predominately local, two-lane roads without paved shoulders. The roads are frequently abutted by old stone walls, large trees with canopies overhanging the road, and overhead utility poles. The western variation has slightly wider road widths and more developed surroundings. The onshore export cables would generally be located within existing public road ROW that may include the road shoulder and medians but may also include off-road areas such as private property and transmission ROWs, and could involve crossings of streams, wetlands, and other sensitive areas.

The western and eastern variations rejoin at the intersection of Route 138 and Mitchell's Lane, continuing north on Route 138 into Portsmouth (4.5 miles [7.2 kilometers]). Route 138 is a four-lane road without paved shoulders, abutted by commercial properties and some residences. When the route reaches Boyd's Lane it follows the same route as the Proposed Action to Brayton Point, including the three options for entering Mount Hope Bay (via HDD). Alternative C-1 would reduce the total offshore export cable route by 9 miles (14 kilometers) and increase the total onshore export cable route by 9 miles (14 kilometers).

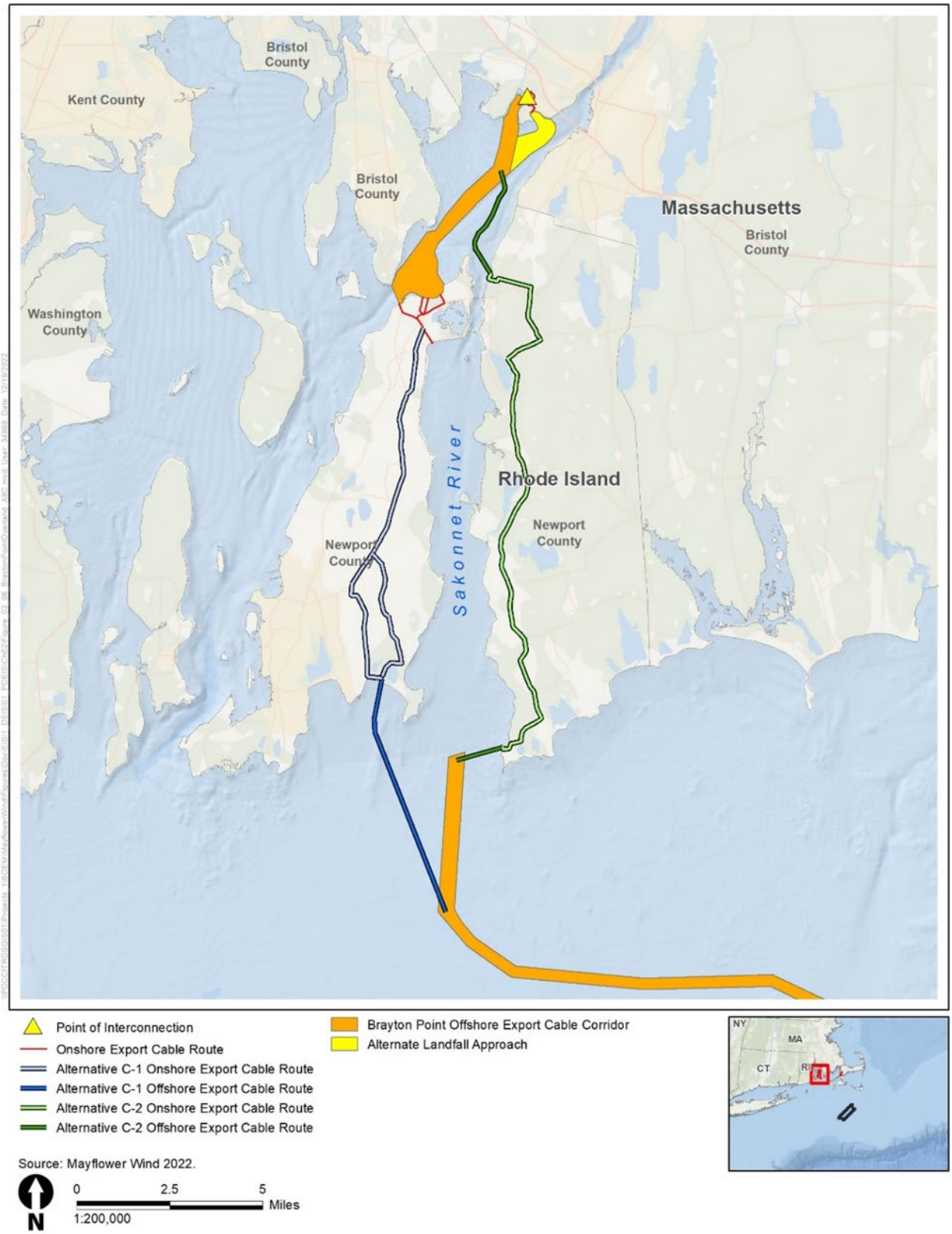


Figure 39. Alternative C fisheries habitat minimization

Alternative C-2 would make landfall on the ocean facing side of Breakwater Point, in the parking lot across from the Sakonnet Harbor. The area is constrained, with the parking lot separated from water by only a narrow strip of riprap coast. The surface grades may not allow for sufficient HDD burial depth in the approach to the onshore entry pit. From Breakwater Point the route follows Route 77 through Little Compton and into Tiverton; once in Tiverton, the route turns east onto Route 177 to Fish Road (12.9 miles [20.8 kilometers] total). From this point, Alternative C-2 would follow Fish Road (north) to Souza Road (west), which turns into Schooner Drive (2.9-mile [4.7-kilometer] total distance). Both Route 77 and Route 177 are two-lane roads with minimal paved shoulders. Fish Road and Souza Road are both narrow two-laned roads without paved shoulders. Schooner Drive is the access road to the residential Village at Mount Hope Bay and Boat House Waterfront Dining restaurant. Schooner Drive ends at the bottom of a hill, where there is an open area with a cul-de-sac, which could serve as the onshore HDD installation area for cable entrance into Mount Hope Bay. Schooner Drive also includes a bridge over an abandoned railroad ROW, which would require a trenchless installation method. Alternative C-2 would reduce the total offshore export cable route by 12 miles (19 kilometers) and increase the total onshore export cable route by 13 miles (20 kilometers). Similar to Alternative C-1, Alternative C-2 would mostly be located in road ROWs but may also cross private property and transmission and railroad ROW.

7.2 Species Covered under Alternatives C-1 and C-2

Data received using the USFWS IPaC system identified the piping plover, *rufa* red knot, roseate tern, northern long-eared bat, and monarch butterfly as potentially occurring in the Alternative C-1 and C-2 Action Area (Table 10). While the tricolored bat is not included in the IPaC system, its presence is expected in the area due to its habitat needs being similar to those of the northern long-eared bat. BOEM additionally reviewed the USGS GAP habitat data which did identify the northern long-eared bat, roseate tern, piping plover, *rufa* red knot, and the tricolored bat as occurring or potentially occurring in the Alternative C-1 and C-2 Action Area (Figure 40, Figure 41, Figure 42, Figure 43, Figure 44). USGS NaBat data suggest that it is probable for tricolored bats and northern long-eared bats to occur in the C-1 and C-2 Action Areas. The Action Areas span two NaBat grid cells each. The probability of summer occupancy for the tricolored bat in Alternative C-1 Action Area was calculated as 81 percent in the southern grid cell and 83 percent in the northern grid cell. The probability of summer occupancy in the Alternative C-2 Action Area was calculated as 83 percent in the southern grid cell and 88 percent in the northern grid cell (Figure 14). For the northern long-eared bat, probability in the C-1 Action Area was estimated as 53 percent in the southern cell and 57 percent in the northern cell. In the C-2 Action Area probability was estimated to be 40 percent in the southern cell and 39 percent in the northern cell (Figure 10).

Prior to traveling along Route 138, the eastern variation additionally abuts Gardiner Pond and the Norman Bird Sanctuary and is 1 mile (1.7 kilometers) northwest of the Sahucest Point National Wildlife Refuge. Both the Norman Bird Sanctuary and the Sahucest Point National Wildlife Refuge provide stopover and wintering habitat that support federally and state-listed migratory birds. Currently, all three bird species have been observed at the Sachuest Point National Wildlife Refuge and along Sakonnet Point, the roseate tern and piping plover have been observed at Norman Bird Sanctuary, the roseate tern has been observed at Gardiner Pond, the piping plover and *rufa* red knot have been observed at Second Beach in Middletown (eBird 2023).

Table 10. Threatened, Endangered, or Candidate Species that occur or potentially occur in the Alternative C-1 and C-2 Action Area based on IPaC

Species	Alternative C-1 Offshore Export Cable Route	Alternative C-1 Onshore Export Cable Route	Alternative C-2 Offshore Export Cable Route South	Alternative C-2 Offshore Export Cable Route North	Alternative C-2 Onshore Export Cable Route	Habitat(s)
Northern long-eared bat (T) (*Myotis septentrionalis*) [a]	Yes	Yes	Yes	Yes	Yes	Winter habitat: hibernacula in caves and mines; Summer habitat: roost and maternity trees with loose bark or cavities near wetlands/open water; forages in open forests, edges, and around wetlands or water (NHESP 2019).
Tricolored bat (PE) (*Perimyotis subflavus*) [b]	Yes	Yes	Yes	Yes	Yes	Winter habitat: hibernacula in caves and mines; Spring, Summer, and Fall Habitat: primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees. May also roost in structures (e.g., barns, bridges). Forages around water and forest edges (NHESP 2015d).
Piping plover (T) (*Charadrius melodus*)	Yes	No	No	No	No	Nesting habitat: sandy coastal dunes and beaches flat and free of vegetation in the narrow land between high tide line and foot of coastal dunes, and in least tern colonies (NHESP 2015a).
Rufa red knot (T) (*Calidris canutus rufa*)	Yes	Yes	Yes	No	Yes	Foraging habitat: intertidal areas, sandy beaches, tidal mudflats, salt marshes, and peat banks (NHESP 2020).
Roseate tern (E) (*Sterna dougallii dougallii*)	Yes	Yes	Yes	Yes	Yes	Breeding habitat: gravelly, sandy, or rocky islands and less commonly at ends of long barrier beaches (NHESP 2015b). Nesting habitat: dense vegetation such as beach pea and seaside goldenrod (NHESP 2015b). Foraging habitat: offshore and in shoals, inlets, and shallow sandbars (NHESP 2015b) Roosting habitat: flocks near tidal inlets.
Monarch butterfly (C) (*Danaus plexippus*) [c]	Yes	Yes	No	Yes	Yes	Areas near flowering plants and milkweed (USFWS 2022a).

Source: see Appendix A.

[a] USFWS has reclassified the northern long-eared bat as endangered, effective March 31, 2023

[b] Tricolored bat does not show up on IPaC, but the species range includes Massachusetts and Rhode Island and suitable habitat is generally similar to northern long-eared bat

[c] Candidate species are provided no statutory protection under the ESA.

C = candidate for federal listing; E = Endangered; PE = Proposed Endangered T = Threatened

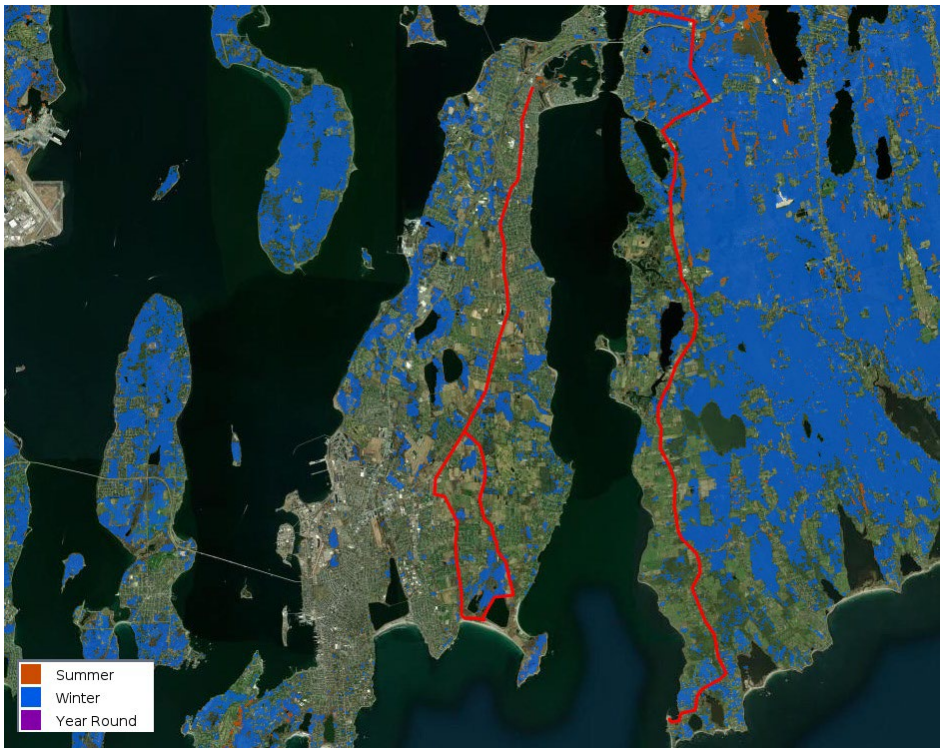


Figure 40. USGS GAP analysis northern *myotis* predicted habitat range for Alternative C

Figure 41. USGS GAP analysis piping plover predicted habitat range for Alternative C

Figure 42. USGS GAP analysis *rufa* red knot predicted habitat range for Alternative C

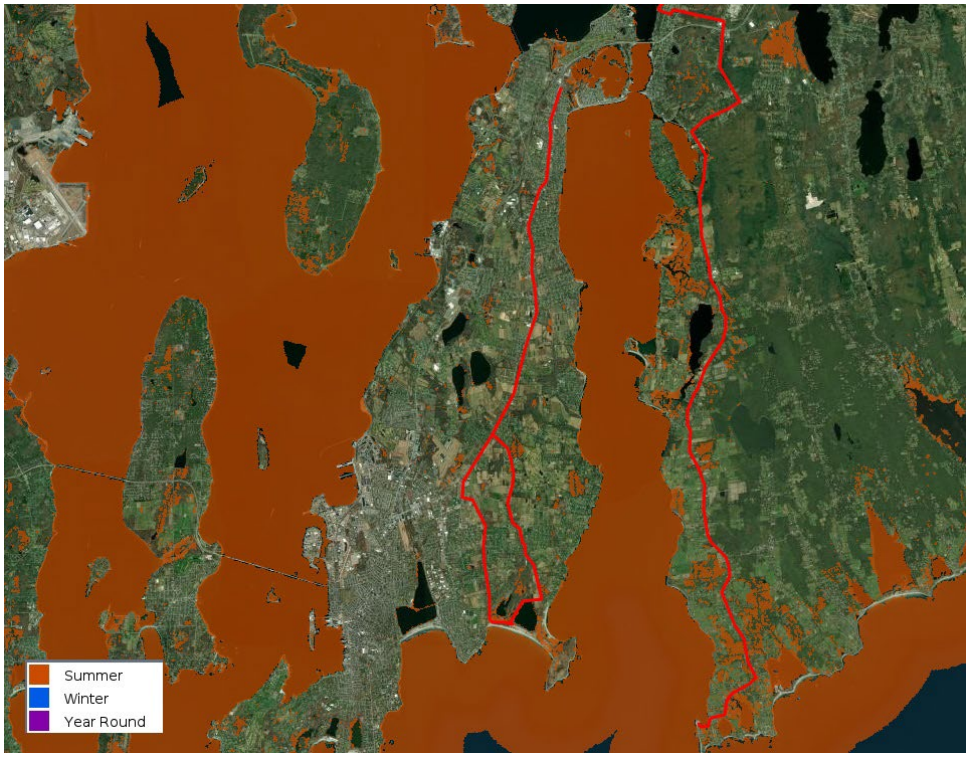


Figure 43. USGS GAP analysis roseate tern predicted habitat range for Alternative C

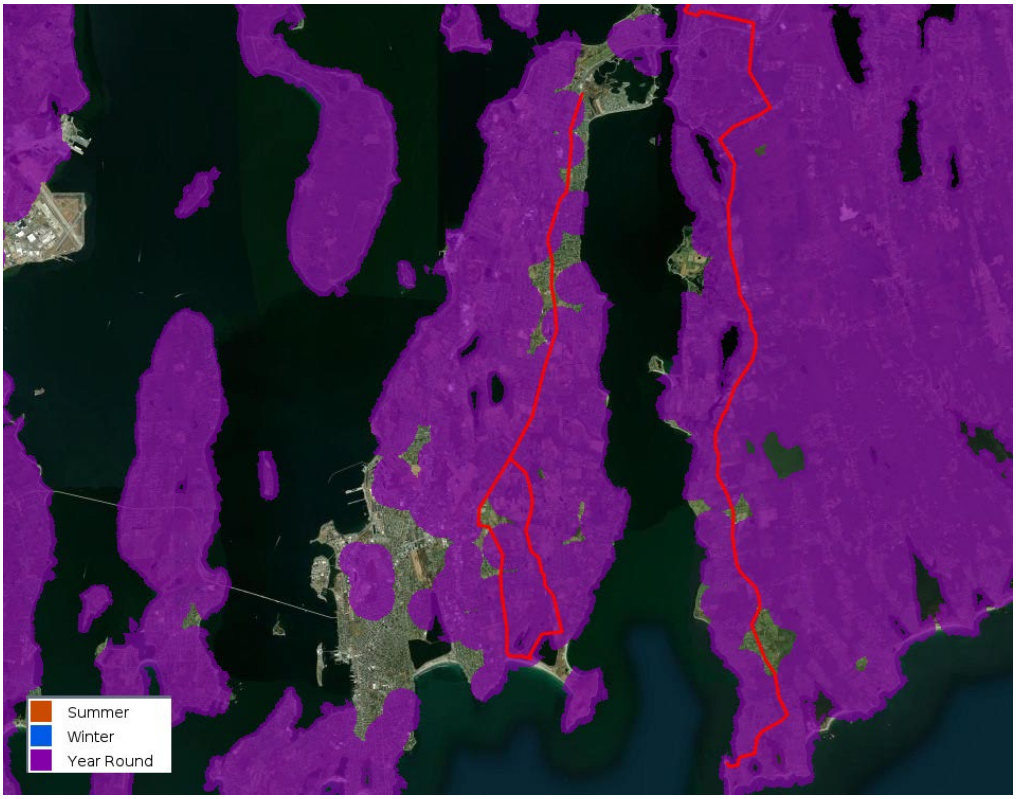


Figure 44. USGS GAP analysis tricolored bat predicted habitat range for Alternative C

The only potential IPFs that would be meaningfully different under Alternative C compared to the Proposed Action are land disturbance and new cable emplacement/maintenance. Impacts associated with construction of onshore elements may result in displacement, or direct injury or mortality of individuals, if occupied by birds at the time of removal that may be foraging or nesting. Alternative C would additionally cause habitat loss from tree and brushland disturbance, which would result in both temporary and permanent impacts. Where necessary, construction of onshore components may require tree clearing and permanent removal of some trees along the edge of the construction corridor. In addition to the forest and brushland area disturbed under the Proposed Action, 4.95 acres (2.00 hectares), 2.59 acres (1.04 hectares), and 15.46 acres (6.26 hectares) of forest habitat could be disturbed under Alternative C-1 (east), Alternative C-1 (west), and Alternative C-2, respectively. In addition, 1.51 acres (0.61 hectare), 1.07 acres (0.43 hectare), and 1.31 acres (0.53 hectare) of brushland under Alternative C-1 (east), Alternative C-1 (west), and Alternative C-2, respectively, would be disturbed in addition to the Proposed Action disturbance (refer to Section 3.5.4). Both the *rufa* red knot and piping plover have been reported in the vicinity of the landfall site at Second Beach and collectively, all three species have also all been identified within the vicinity of Alternative C-1 (eBird 2023). Land disturbance is not likely to affect federally listed birds if they were to occur in the vicinity of Alternative C-1 during construction, maintenance, and decommissioning as landfall at the Second Beach parking lot in Middletown, Rhode Island will be conducted via HDD. Both the piping plover and roseate tern have been reported in the vicinity of the landfall site at the Sakonnet Point sand bar. Although Alternative C-2 would make landfall on the ocean facing side of Breakwater Point, in the parking lot across from the Sakonnet Harbor, the surface grades may not allow for sufficient HDD burial depth in the approach to the onshore entry pit. Additionally, the piping plover has been reported in the vicinity of the landfall site at Sakonnet Point Haffenreffer Wildlife Refuge (eBird 2023). Habitat disturbance with construction at the landfall site for Alternative C-2 could adversely affect habitats and disturb individuals of the roseate tern and piping plover if performed at times of year that the birds are typically present. As stated previously, piping plovers, which could nest in the

area, would be especially sensitive to disturbance. The presence of humans is stressful for adults and chicks, forcing them to spend significantly less time foraging, which may result in decreased overall reproductive success. Excessive disturbance may cause piping plovers to desert the nest, exposing eggs or chicks to the summer sun and predators. Interrupted feedings may stress juvenile birds during critical periods in their development, and foot and vehicle traffic may crush eggs or chicks (USFWS 1996). USFWS (2019b) reports that activities within 1 mile (1.6 kilometers) of a beach, dune, or intertidal area may affect piping plovers. These activities include any permanent or temporary increases in disturbance between March 15 and August 31, including but not limited to major construction work.

In the aquatic environment, Alternative C-1 and Alternative C-2 would reduce the total offshore export cable route by 9 miles (14 kilometers) and 12 miles (19 kilometers), respectively. However, cable emplacement activity would still occur and result in short-term and localized sediment suspension. Individual birds would be expected to successfully forage in nearby areas and impacts would be too small to be measured or evaluated (*insignificant*) and unlikely to occur (*discountable*).

Impacts associated with construction of onshore elements of Alternative C for the northern long-eared bat and the tricolored bat may occur if construction activities take place during the active season (generally April through October) and may result in displacement, or direct injury or mortality of individuals, particularly juveniles who are unable to flush from a roost, if occupied by bats at the time of removal. The northern long-eared bat has been identified as potentially occurring within the Alternative C Action Area based on USGS GAP analysis predicted habitat range (Figure 40) and the tricolored bat has been estimated to have a high probability of occurring in the Alternative C Action Area (Figure 44). The primary effects on the bat species from construction of the onshore components would be potential loss of suitable roosting or foraging habitat which may result in both temporary and permanent impacts affecting roosting, foraging, or maternity colonies. Approximately 68 percent and 56 percent of Alternative C-1 and Alternative C-2, respectively, consist of developed land cover types, while the remaining area consists of natural vegetation land cover. Ecological communities which Alternative C-1 may traverse or include, but are not limited to, are beaches, deciduous forest, brushland, cropland, and mixed forest (RIGIS 2011). Ecological communities in Alternative C-2 may traverse or include, but are not limited to, pastures, deciduous forest, wetland, cropland, and brushland (RIGIS 2011). Table 11 further summarizes the vegetation communities within the Alternative C-1 and C-2 onshore export cable routes. Alternative C-2 would result in a greater impact on both bat species as a greater number of acers of natural vegetation would be affected than under Alternative C-1. The onshore cable routes under both Alternative C-1 and Alternative C-2 would be installed within existing road ROWs to the extent feasible; however, the alternate routes may require pathways in road shoulder, median, and off-road, including private property, transmission ROWs, stream/wetland crossings, and railroad ROWs due to the narrower roads lined with historic stonewalls and structures in the southern portions of the alternate routes. Despite this, impacts on both bat species under either alternative would be limited to the immediate vicinity of the roadway where there is already limited habitat. Based on the above information, potential effects on the northern long-eared bat and the tricolored bat from land disturbance would be unlikely to occur (*discountable*), and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*).

Potential effects on the monarch butterfly would only occur during onshore construction in the vicinity of undeveloped lands where milkweed and other native nectar plants are present. While adult monarch butterflies have the mobility to avoid construction equipment, larval stages could be vulnerable to being crushed by construction equipment, particularly during land clearing and ground excavation. Although Alternative C construction, operation, and decommissioning could potentially affect a small number of monarch butterflies, impacts are anticipated to be limited to behavioral avoidance of construction activity. Collision with Project vehicles and equipment is unlikely because the Project would not cause a noticeable increase in traffic. If suitable habitat is widespread or present in the Alternative C Action Area in the form of milkweed or native nectar plants, monarch may be displaced as suitable habitat may be

removed. Based on this information, potential effects on monarch butterflies from land disturbance and related activities (e.g., construction vehicle use) would be unlikely to occur (*discountable*), and the size of any impact, were it to occur, would be too small to be measured or evaluated (*insignificant*).

Table 11. Vegetation potentially affected by Alternative C-1 and C-2 onshore export cables (acres)

Vegetation Community	Alternative C-1 East	Alternative C-1 West	Alternative C-2
Brushland	1.51	1.07	1.31
Agriculture [a]	8.99	8.84	15.08
Mixed Forest	1.34	0.80	0.31
Softwood Forest	0	0	0.09
Deciduous Forest	3.61	1.79	15.06
Sandy Areas [b]	0.20	0.20	0.51
Wetlands [c]	0.92	3.31	1.27
Total	**16.57**	**16.01**	**33.63**

Source: Mayflower Draft EIS, Ch. 3.05.4; RIGIS 2011
[a] Agriculture includes cropland (tillable), abandoned fields/orchards, pastures, orchards, groves, and nurseries.
[b] Sandy Areas include beach and non-beach sandy areas. Note, Alternative C-2 does not have any beach sandy areas, and each sandy area for Alternative C-1 would be avoided with HDD.
[c] The wetland areas presented in this table are based on a broad land cover GIS dataset and do not substitute for the more accurate wetlands GIS data used to generate wetland impacts in Section 3.5.8, *Wetlands*.

7.3 Determination of Effect for Alternatives C-1 and C-2

Given that the piping plover, roseate tern, *rufa* red knot occur or potentially occur in portions of the Alternative C Action Area, and as described in Section 7, there is risk to these species during construction, O&M, and decommissioning, thus, the Project **may affect** these species. However, the differences between Alternative C and the Proposed Action are limited in location and not materially different, and therefore, Alternative C would **not likely adversely affect** the piping plover and the *rufa* red knot for the same reasons described for the Proposed Action in Section 6.1.2. The impact to roseate terns is not materially different from the Proposed Action, and thus Alternative C would remain **likely to adversely affect.**

Given that the northern long-eared bat, the tricolored bat, and monarch butterfly occur or potentially occur in portions of the Action Area, as described in Section 5, there is potential risk to the species during construction, O&M, and decommissioning, and the proposed Project **may affect** the northern long-eared bat, the tricolored bat, and the monarch butterfly. However, the differences between Alternative C and the Proposed Action are limited in location and not materially different, and therefore, Alternative C would **not likely adversely affect** the northern long-eared bat, the tricolored bat, or monarch butterfly (should it be listed in the future) for the same reasons described for the Proposed Action in Section 6.1.3.

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Appendix A USFWS Information for Planning and Consultation (IPaC) Results

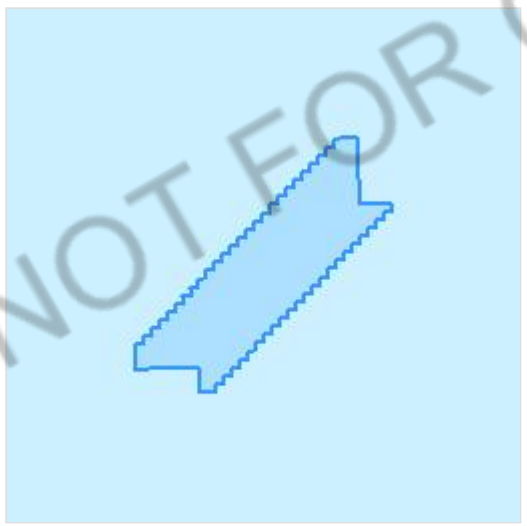
IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location



Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300

Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Atlantic Puffin Fratercula arctica This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/8943	Breeds Apr 15 to Aug 15

Black Scoter Melanitta nigra — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Murre Uria aalge — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Cory's Shearwater Calonectris diomedea — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Dovekie Alle alle — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Great Shearwater Puffinus gravis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Manx Shearwater Puffinus puffinus — Breeds Apr 15 to Oct 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Pomarine Jaeger Stercorarius pomarinus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Razorbill Alca torda — Breeds Jun 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

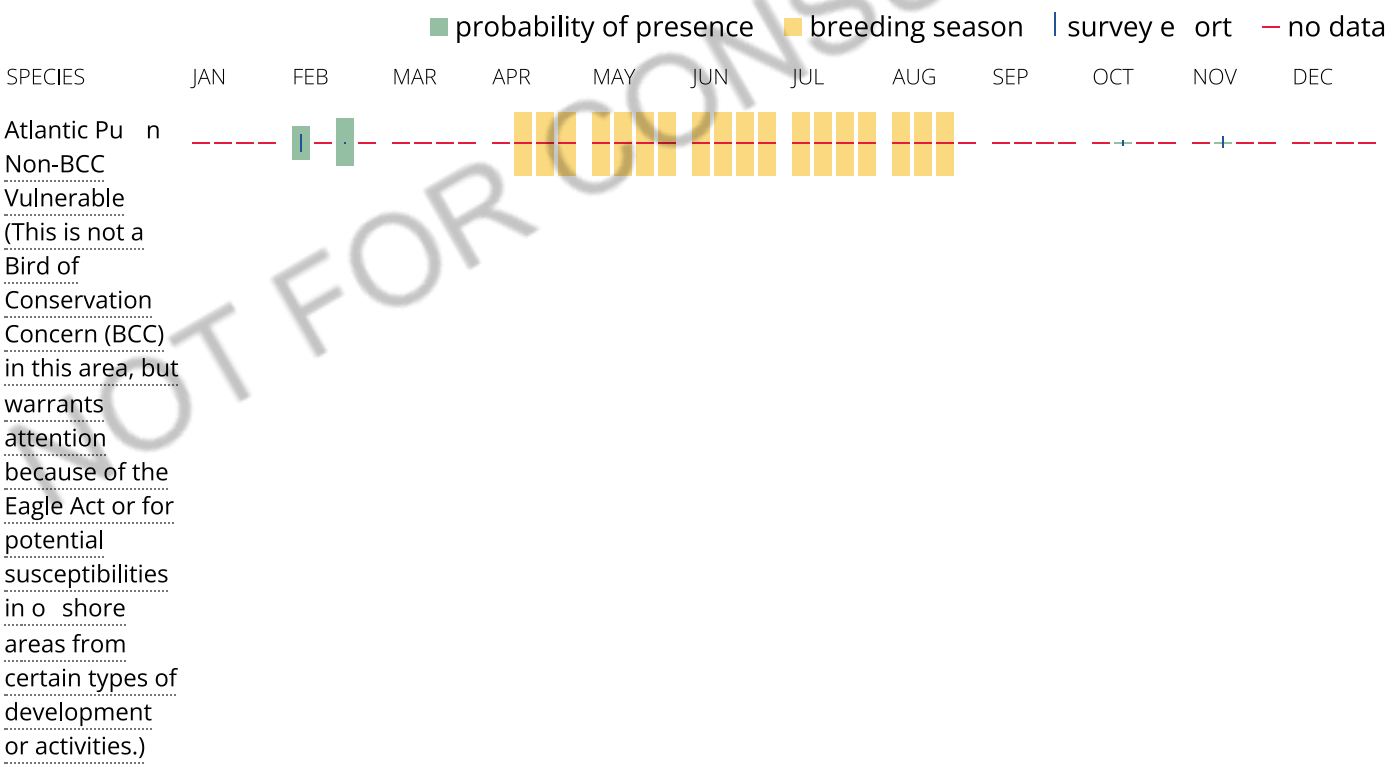
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

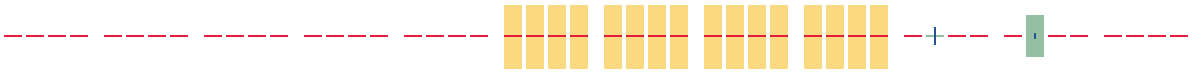
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



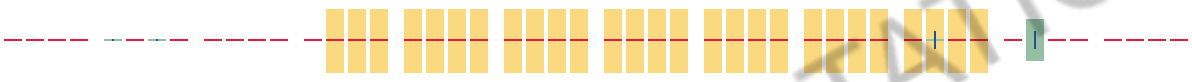
Black Scoter
Non-BCC
Vulnerable
(This is not a
Bird of
Conservation
Concern (BCC)
in this area, but
warrants
attention
because of the
Eagle Act or for
potential
susceptibilities
in o shore
areas from
certain types of
development
or activities.)

Black-legged
Kittiwake
Non-BCC
Vulnerable
(This is not a
Bird of
Conservation
Concern (BCC)
in this area, but
warrants
attention
because of the
Eagle Act or for
potential
susceptibilities
in o shore
areas from
certain types of
development
or activities.)

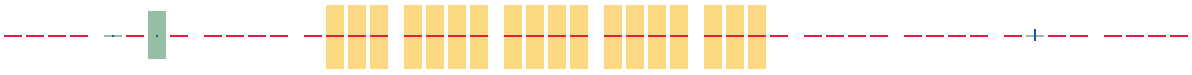
Common Eider
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)



Common Loon
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)



Common Murre Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)



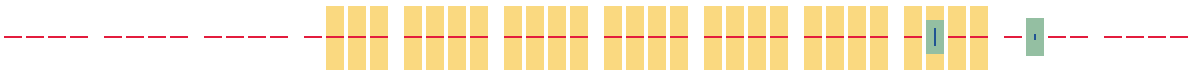
Cory's Shearwater BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Dovekie Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)

Great Shearwater Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)

Long-tailed Duck Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)

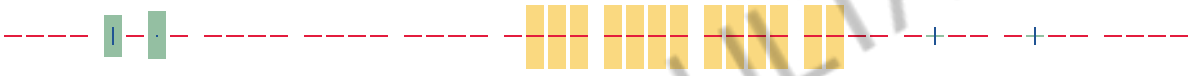
Manx Shearwater BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Pomarine Jaeger Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

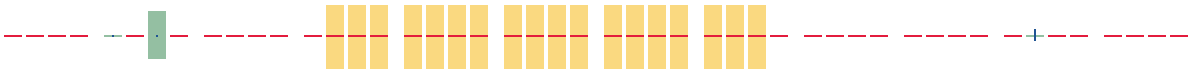
Razorbill Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)



Red-throated Loon
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)

Surf Scoter
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)

Thick-billed Murre
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)



White-winged Scoter
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

THERE ARE NO KNOWN COASTAL BARRIERS AT THIS LOCATION.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should

seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

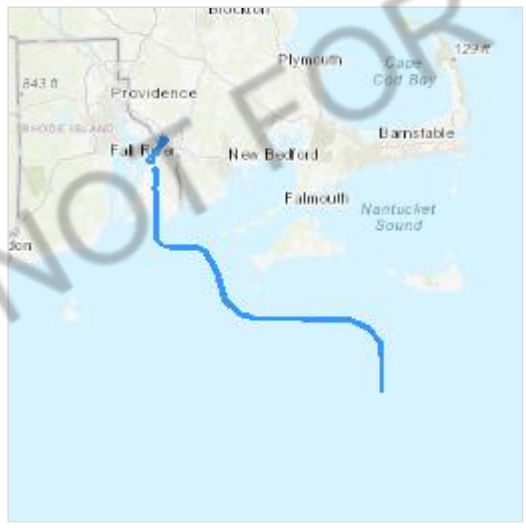
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Massachusetts and Rhode Island



Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Atlantic Pu n Fratercula arctica — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/8943

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Guillemot Cepphus grylle — Breeds May 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Brown Pelican Pelecanus occidentalis — Breeds Jan 15 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Murre Uria aalge — Breeds Apr 15 to Aug 15
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Cory's Shearwater Calonectris diomedea — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Double-crested Cormorant phalacrocorax auritus — Breeds Apr 20 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/3478

Dovekie Alle alle — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Great Shearwater Pu nus gravis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa avipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Manx Shearwater Pu nus pu nus — Breeds Apr 15 to Oct 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Pomarine Jaeger Stercorarius pomarinus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Razorbill Alca torda — Breeds Jun 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-necked Phalarope Phalaropus lobatus — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Royal Tern Thalasseus maximus — Breeds Apr 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Sooty Tern Onychoprion fuscatus — Breeds Mar 10 to Jul 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

South Polar Skua Stercorarius maccormicki — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wilson's Storm-petrel Oceanites oceanicus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

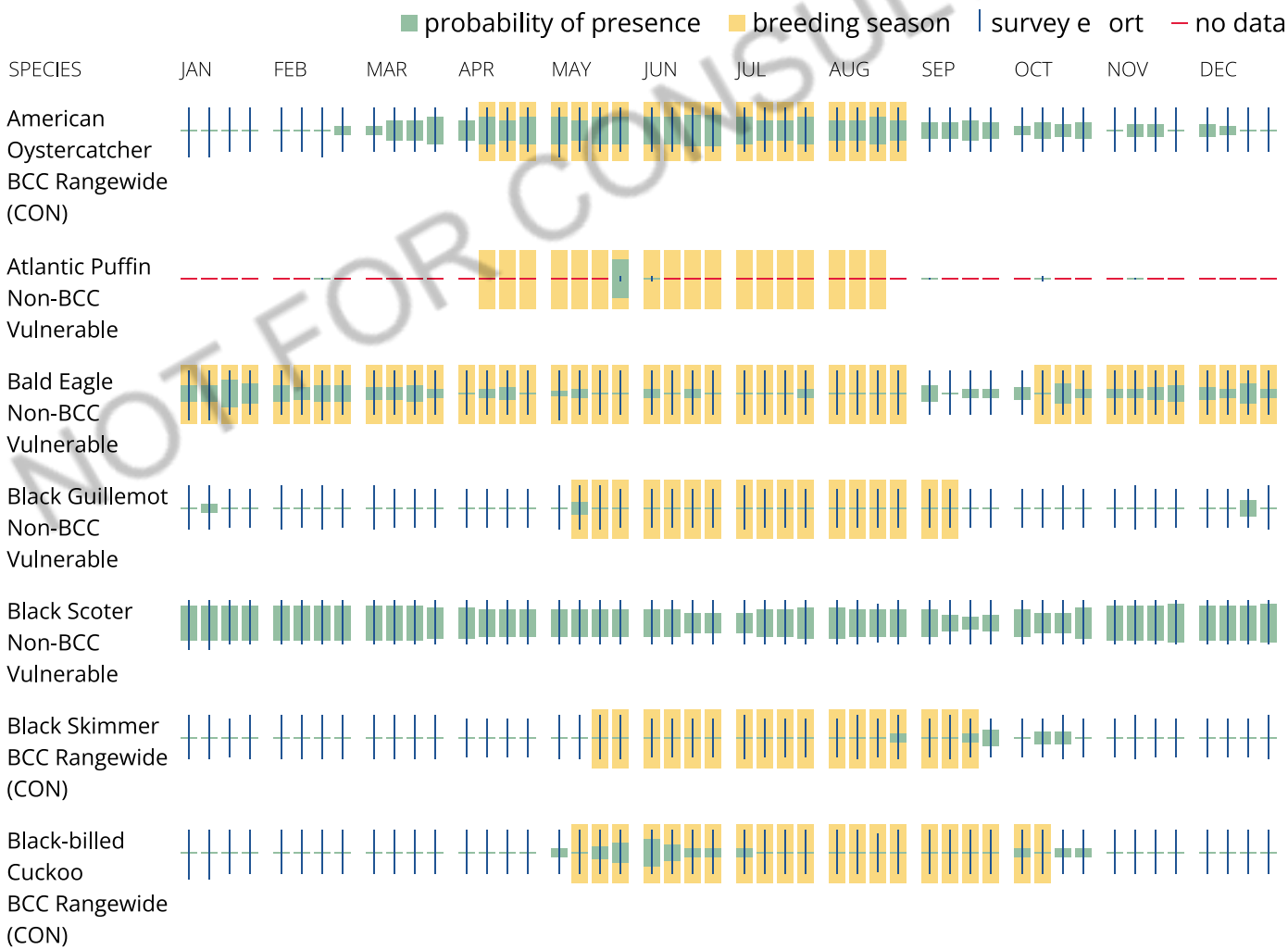
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

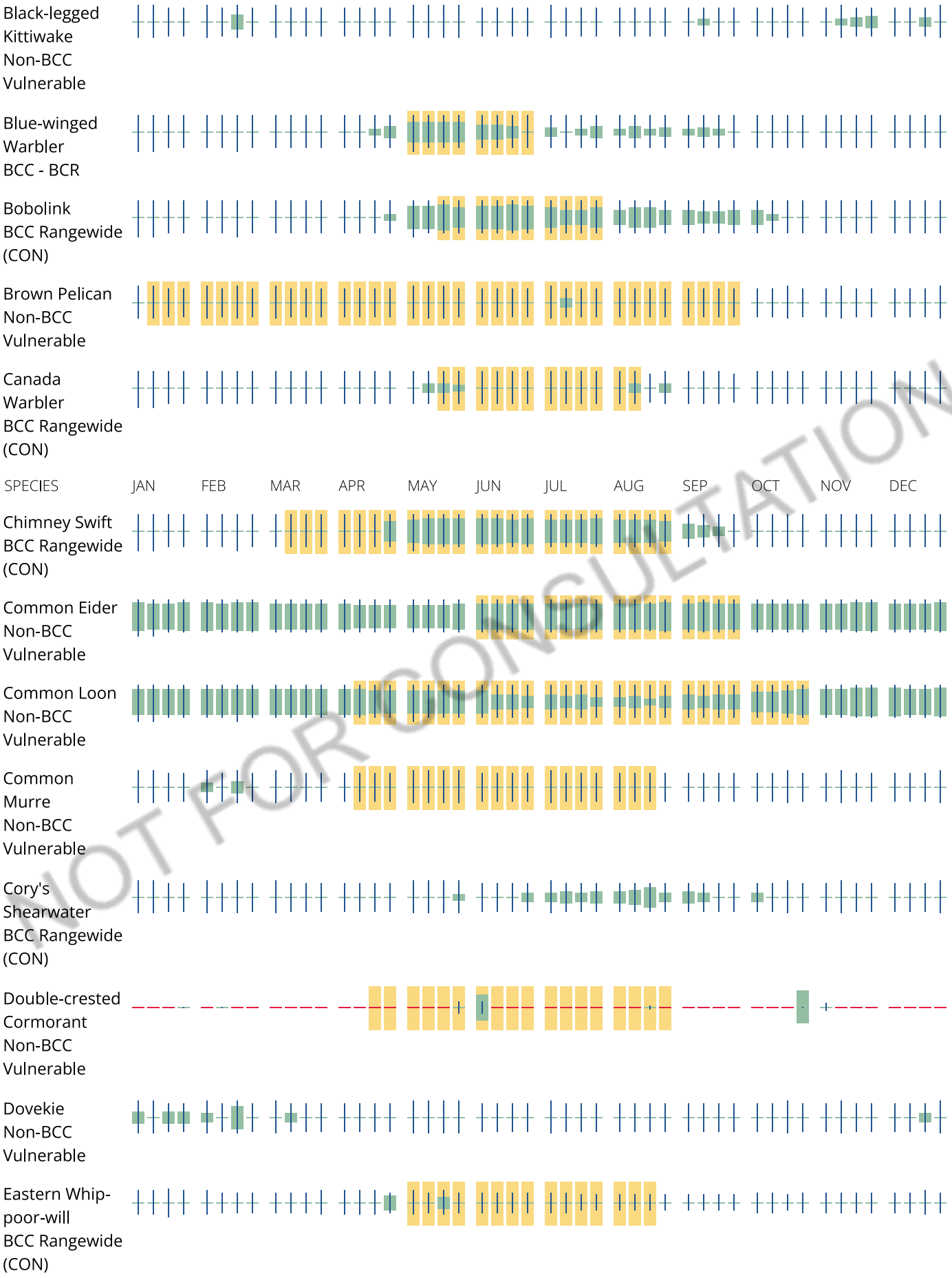
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

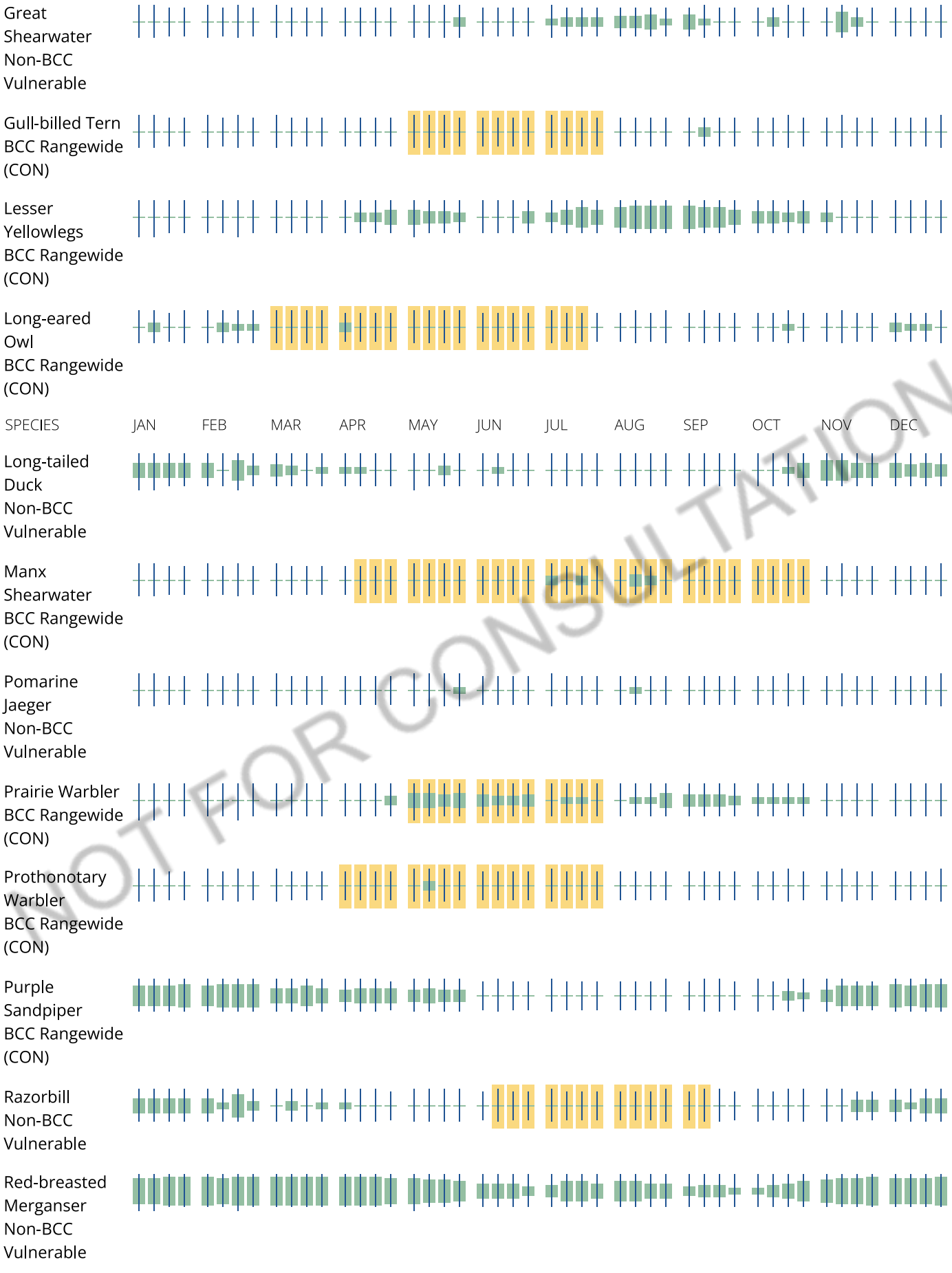
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

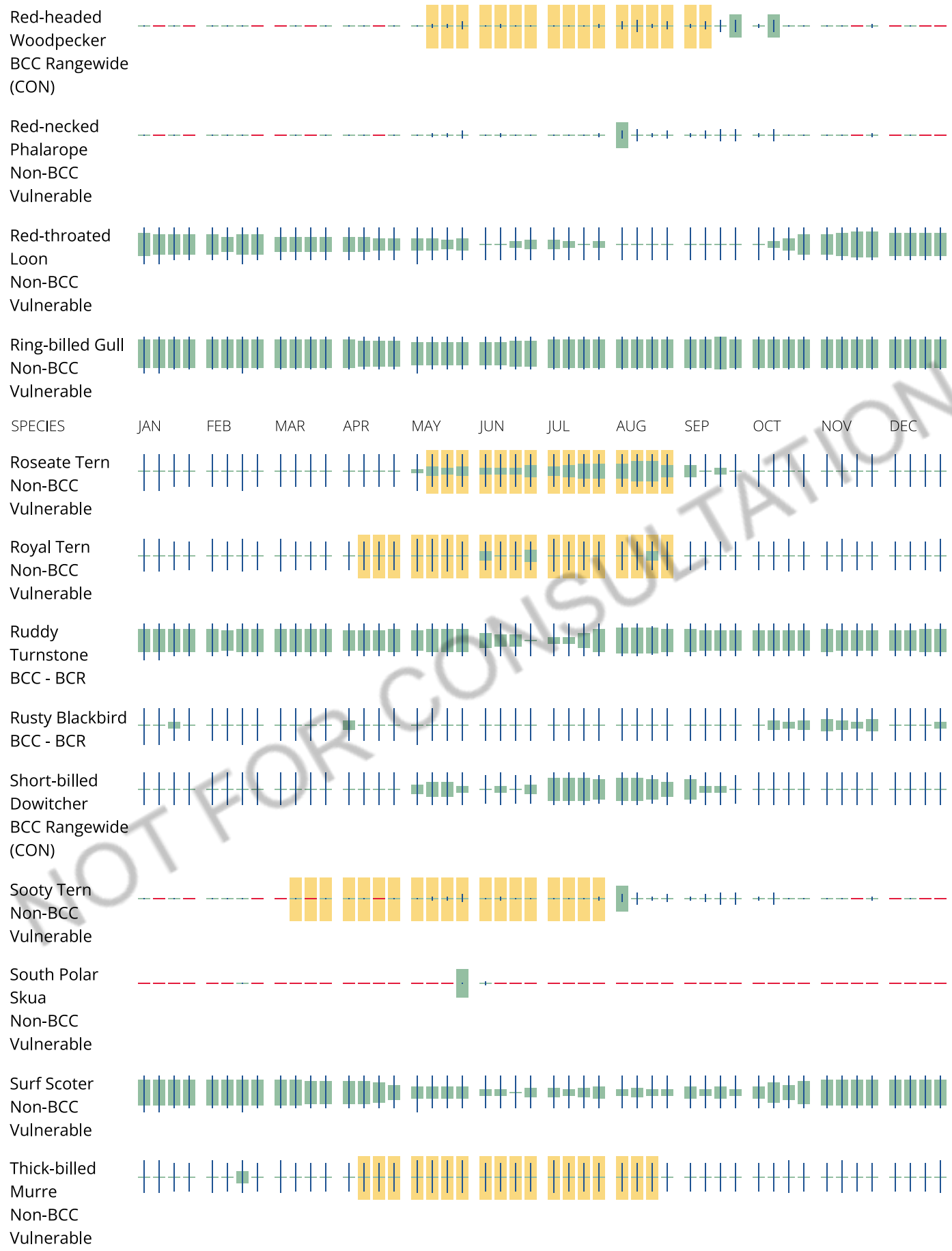
No Data (–)
A week is marked as having no data if there were no survey events for that week.

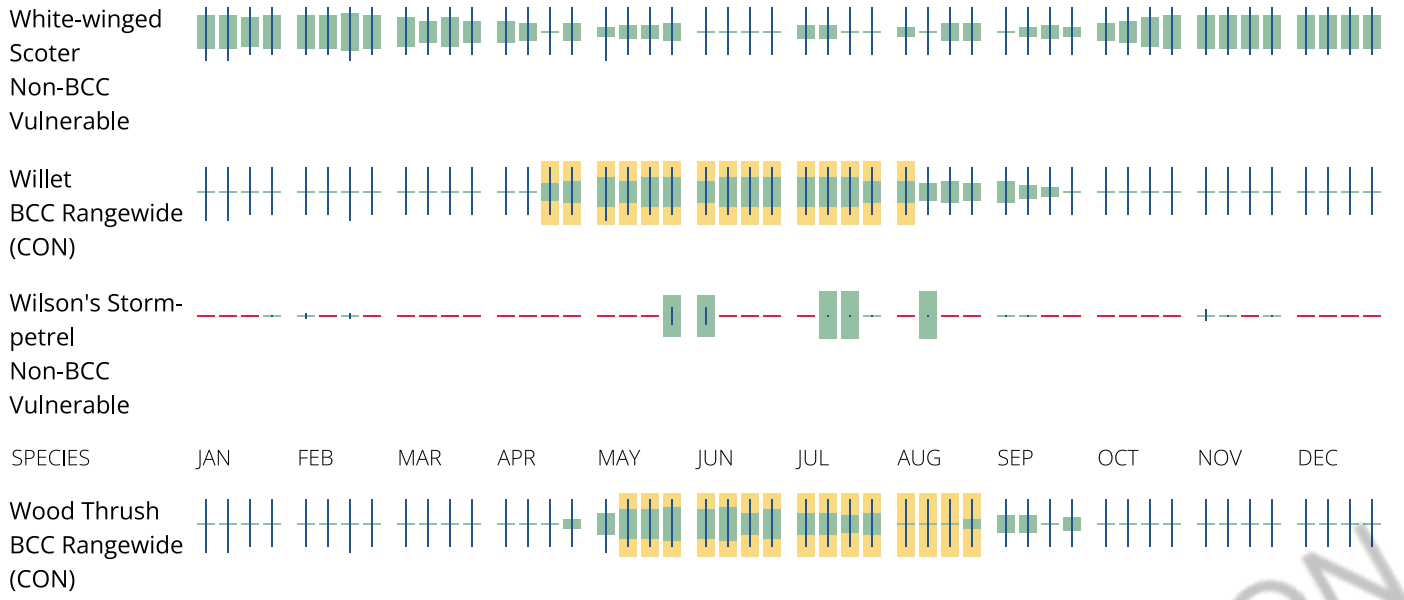
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.











Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

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What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
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Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

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What if I have eagles on my list?

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Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

This location overlaps the following CBRS unit(s):

System Unit (SU)

Most new federal expenditures and nancial assistance, including federal ood insurance, are prohibited within System Units. ***Federally-funded projects within System Units require consultation with the Service.*** *Consultation is not required for projects using private, state, or local funds.*

D02B - SU 11/16/1990 - FI 11/16/1990
RI-02 - SU 11/16/1990 - FI 11/16/1990
RI-02 - SU 11/15/1993 - FI 11/16/1991

Otherwise Protected Area (OPA)

OPAs are denoted with a "P" at the end of the unit number. The only prohibition within OPAs is on federal flood insurance. ***CBRA consultation is not required for projects within OPAs.*** *However, agencies providing disaster assistance that is contingent upon a requirement to purchase flood insurance after the fact are advised to disclose the OPA designation and information on the restrictions on Federal flood insurance to the recipient prior to the commitments of funds.*

RI-03P - FI 11/16/1991
RI-04P - FI 11/16/1991

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Bristol County, Massachusetts

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

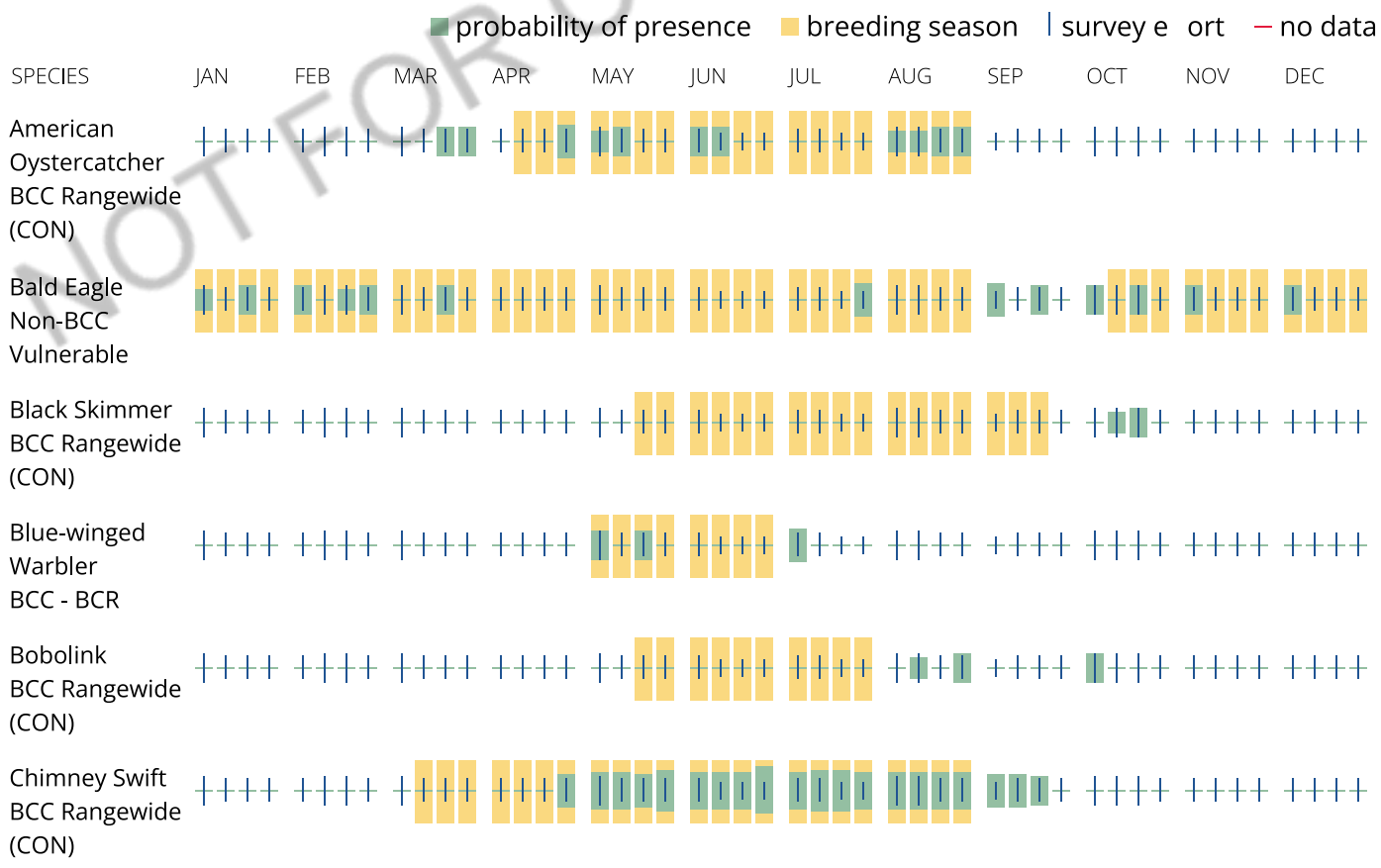
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

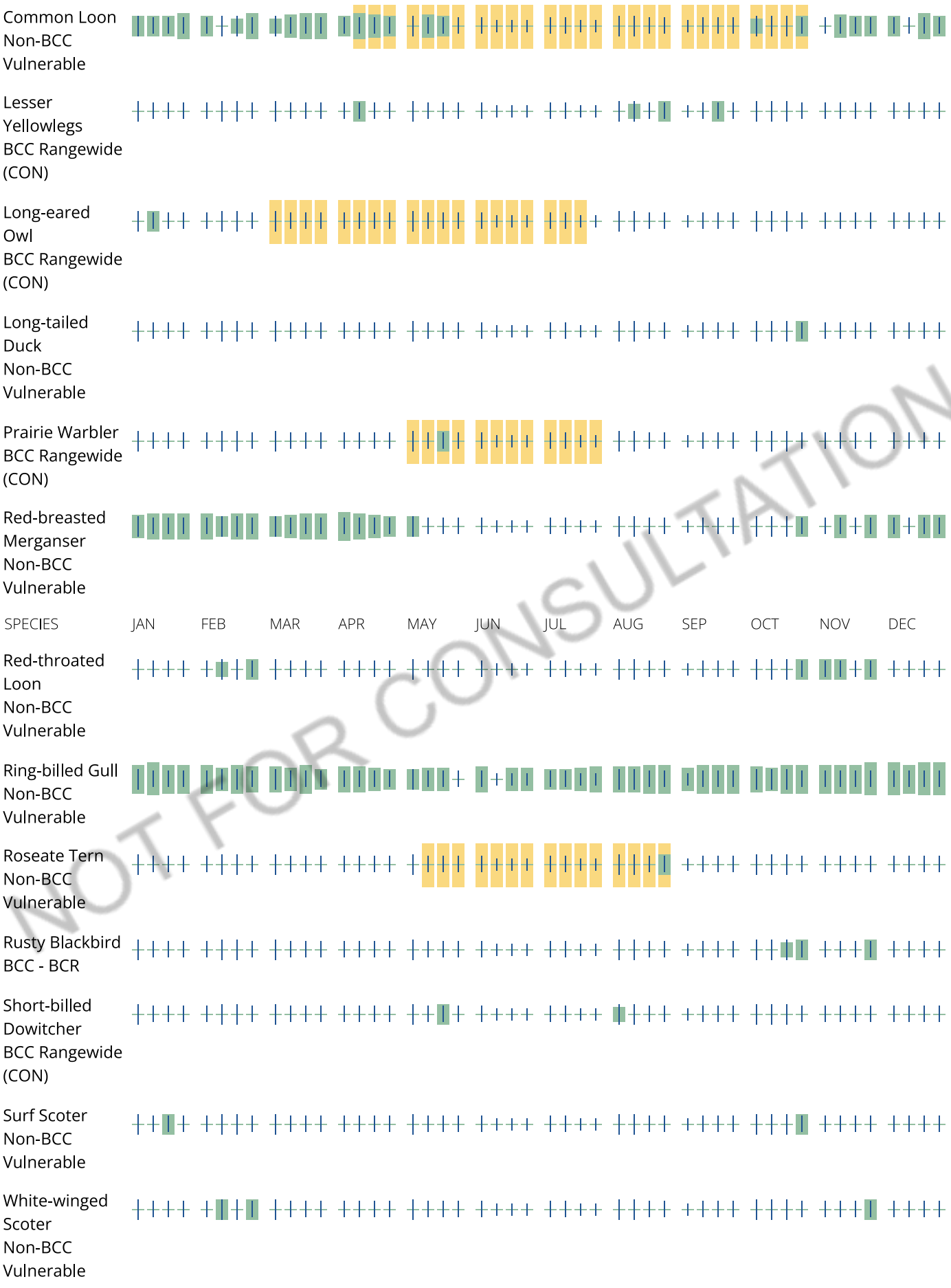
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

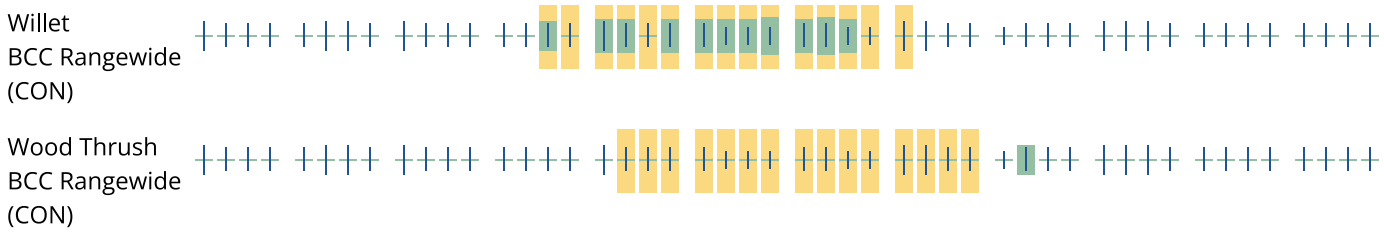
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

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How do I know if a bird is breeding, wintering or migrating in my area?

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There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER

Estuarine

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Bristol County, Massachusetts

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

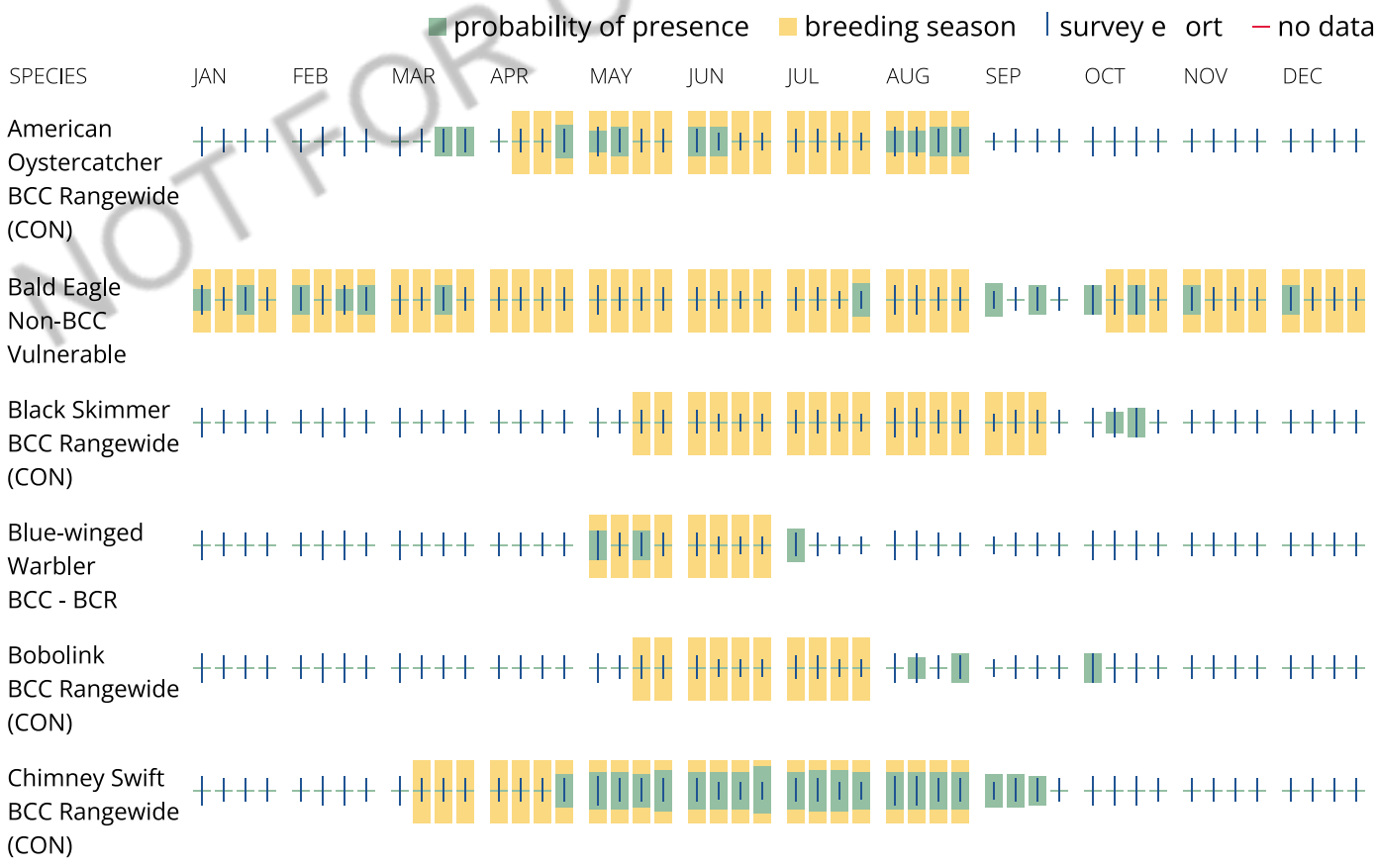
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

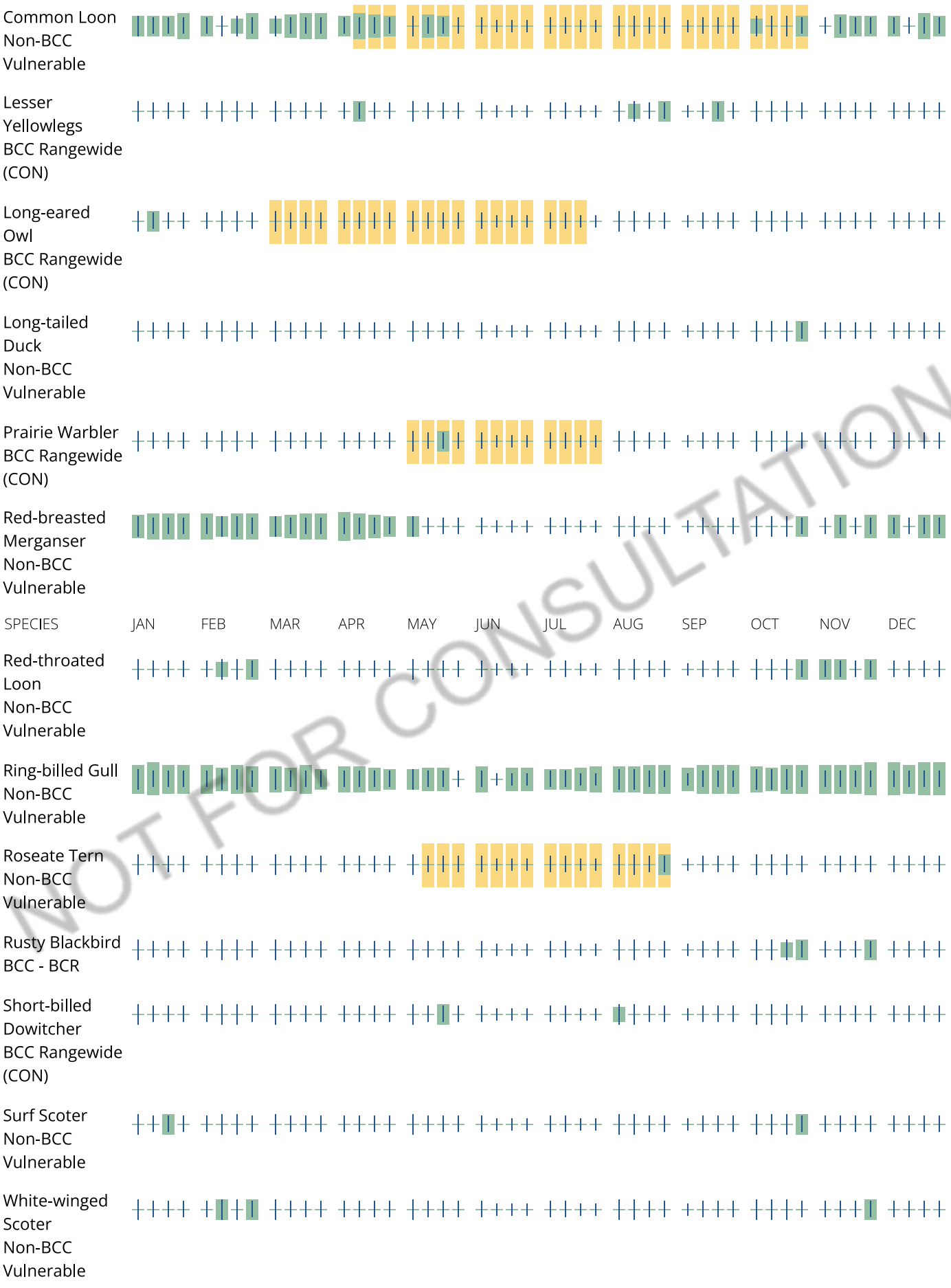
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

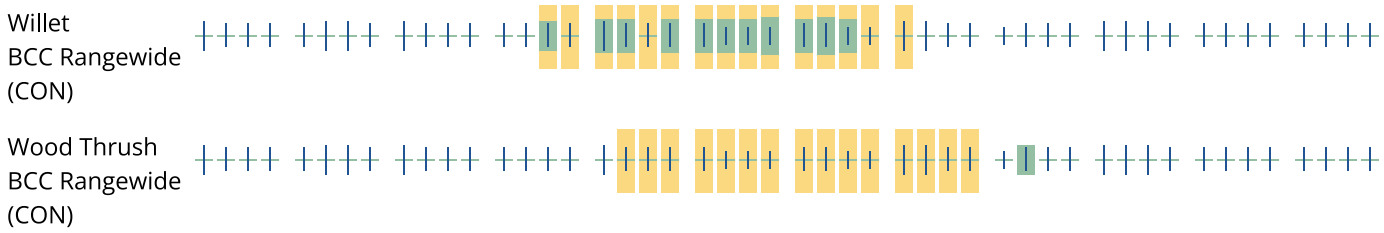
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory

birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

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CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

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Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

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There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER

Estuarine

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

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IPaC **U.S. Fish & Wildlife Service**

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Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Bristol County, Massachusetts

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

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Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

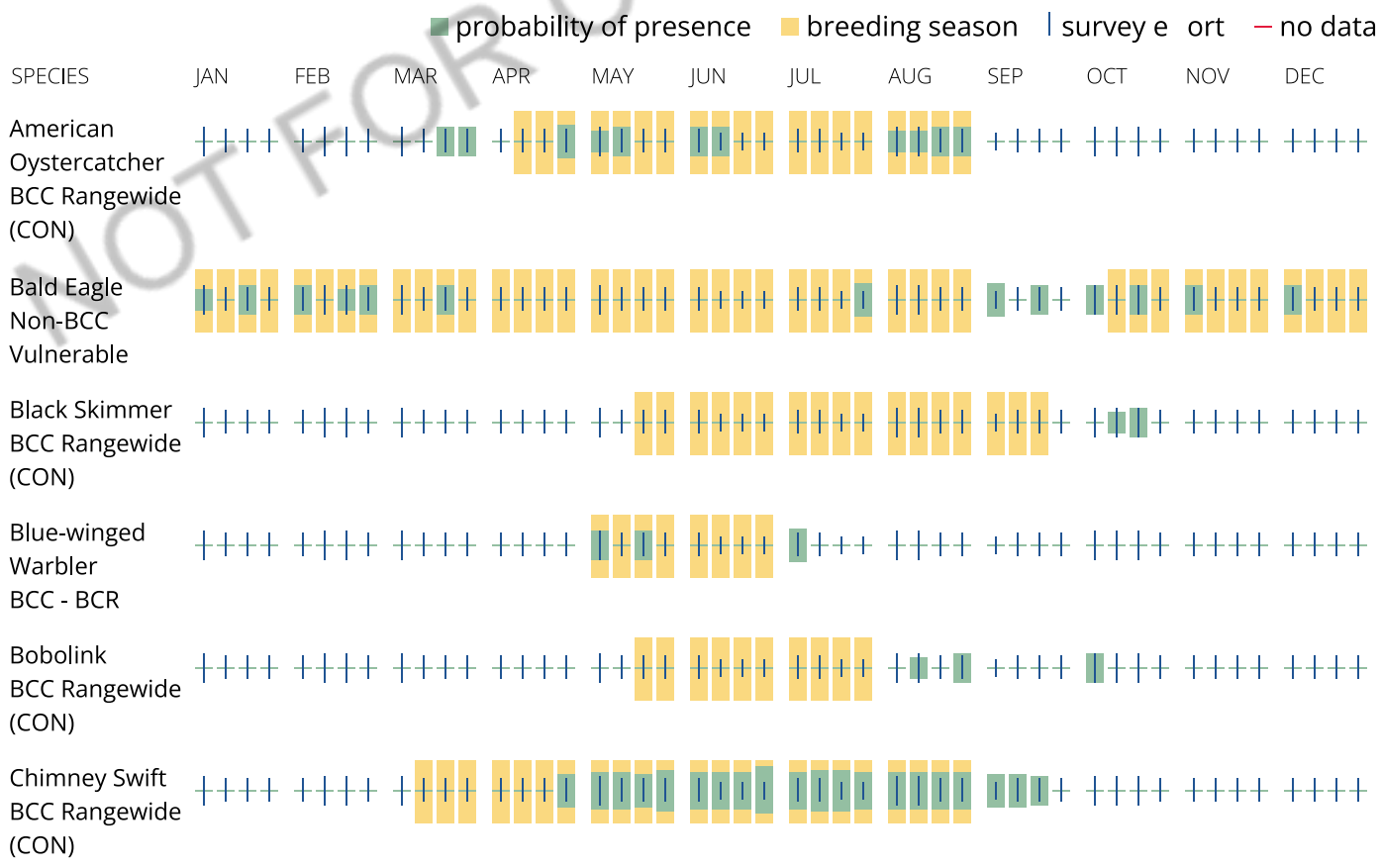
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

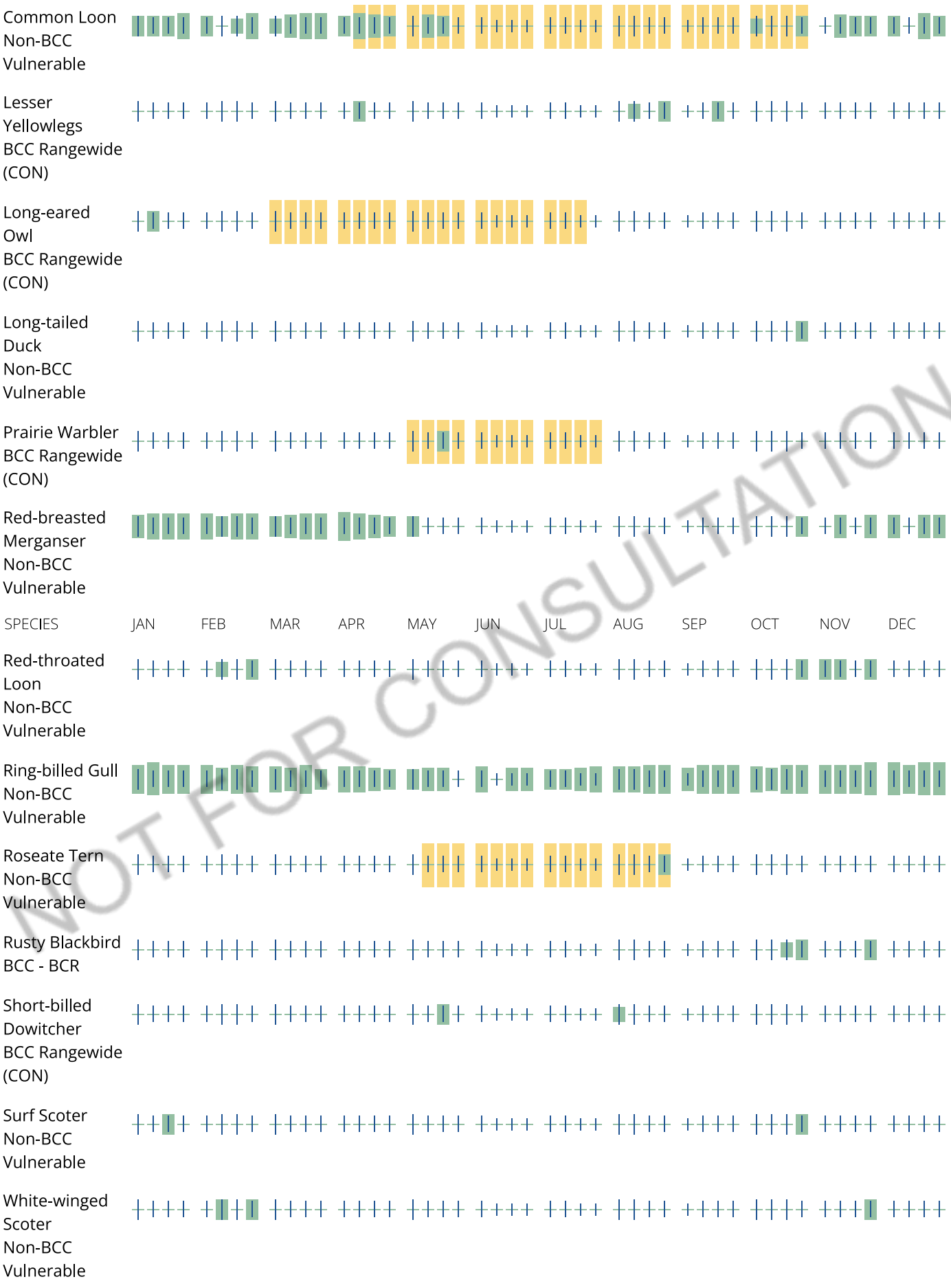
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

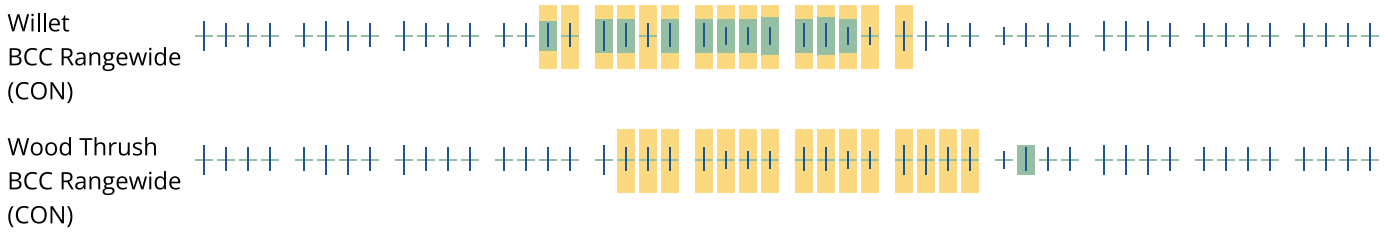
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory

birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC **U.S. Fish & Wildlife Service**

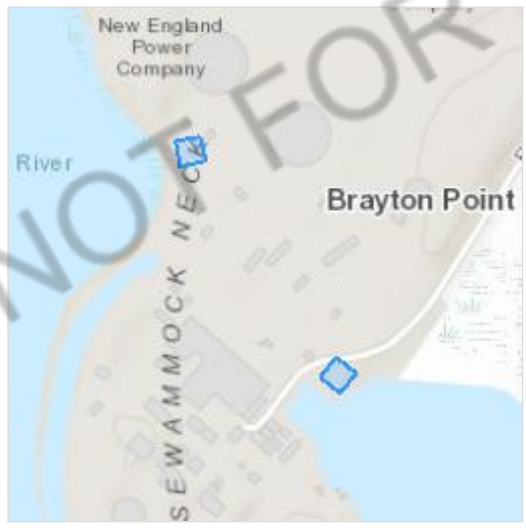
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Bristol County, Massachusetts



Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

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The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

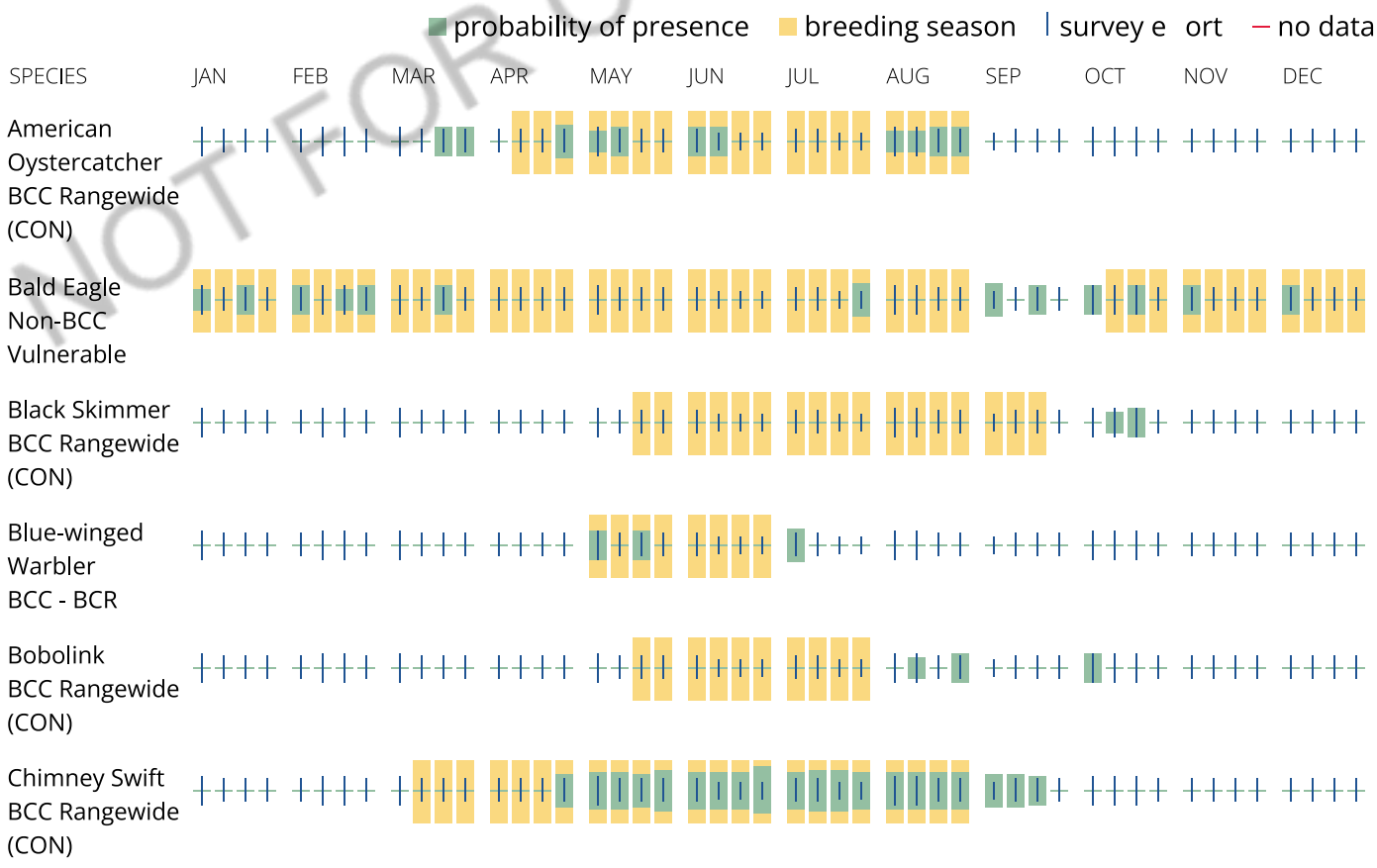
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

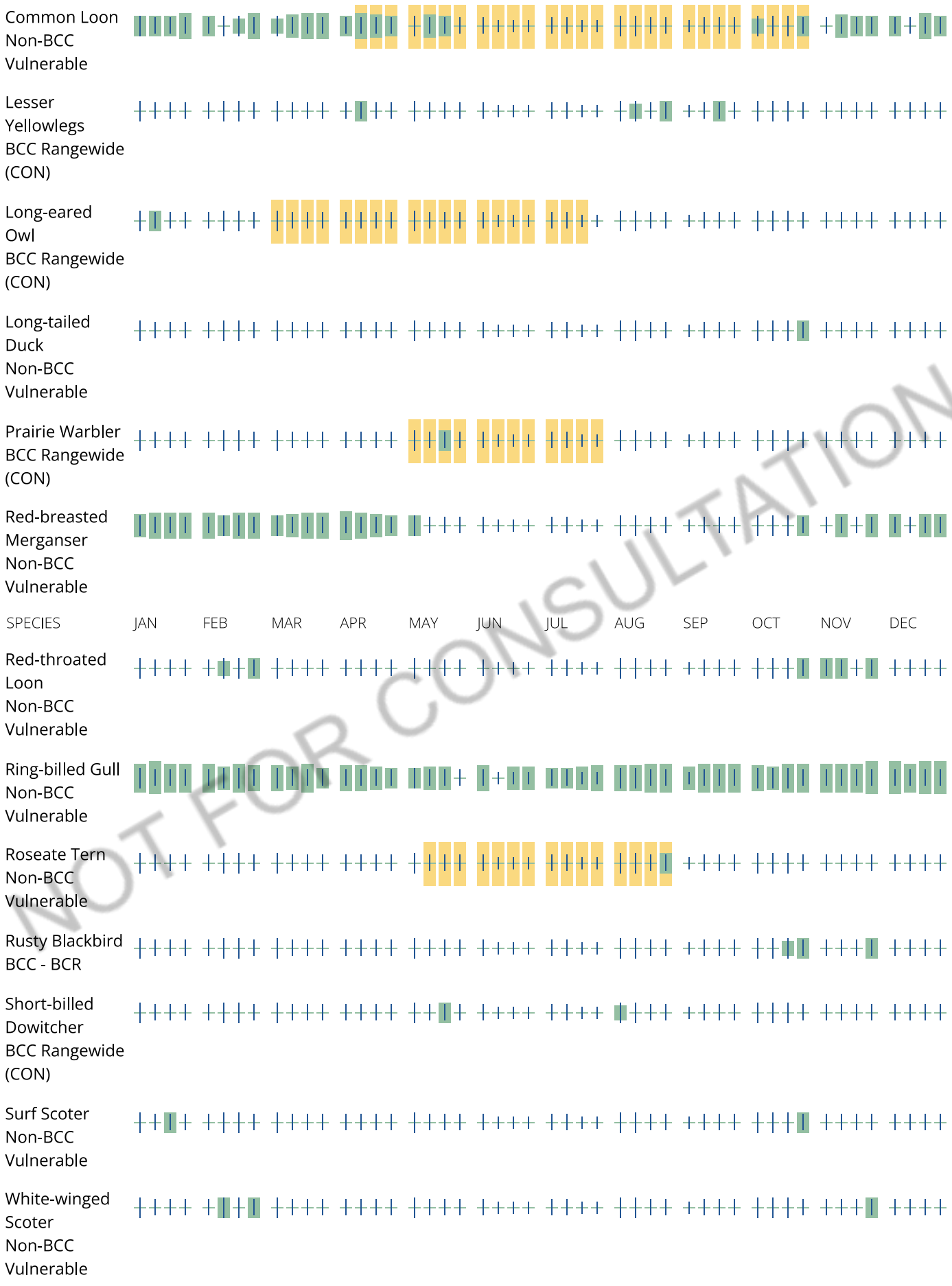
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

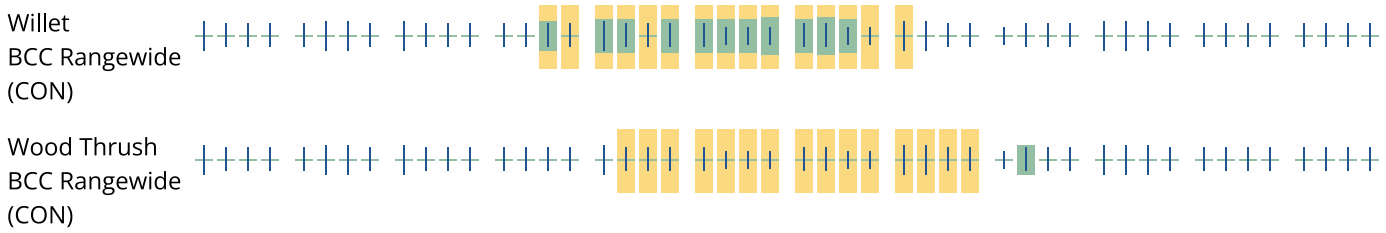
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory

birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Barnstable County, Massachusetts

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Sandplain Gerardia Agalinis acuta Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8128	Endangered

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle *Haliaeetus leucocephalus* — Breeds Oct 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Skimmer *Rynchops niger* — Breeds May 20 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo *Coccyzus erythropthalmus* — Breeds May 15 to Oct 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler *Vermivora pinus* — Breeds May 1 to Jun 30

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink *Dolichonyx oryzivorus* — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler *Cardellina canadensis* — Breeds May 20 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift *Chaetura pelagica* — Breeds Mar 15 to Aug 25

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will *Antrostomus vociferus* — Breeds May 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Kentucky Warbler *Oporornis formosus* — Breeds Apr 20 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

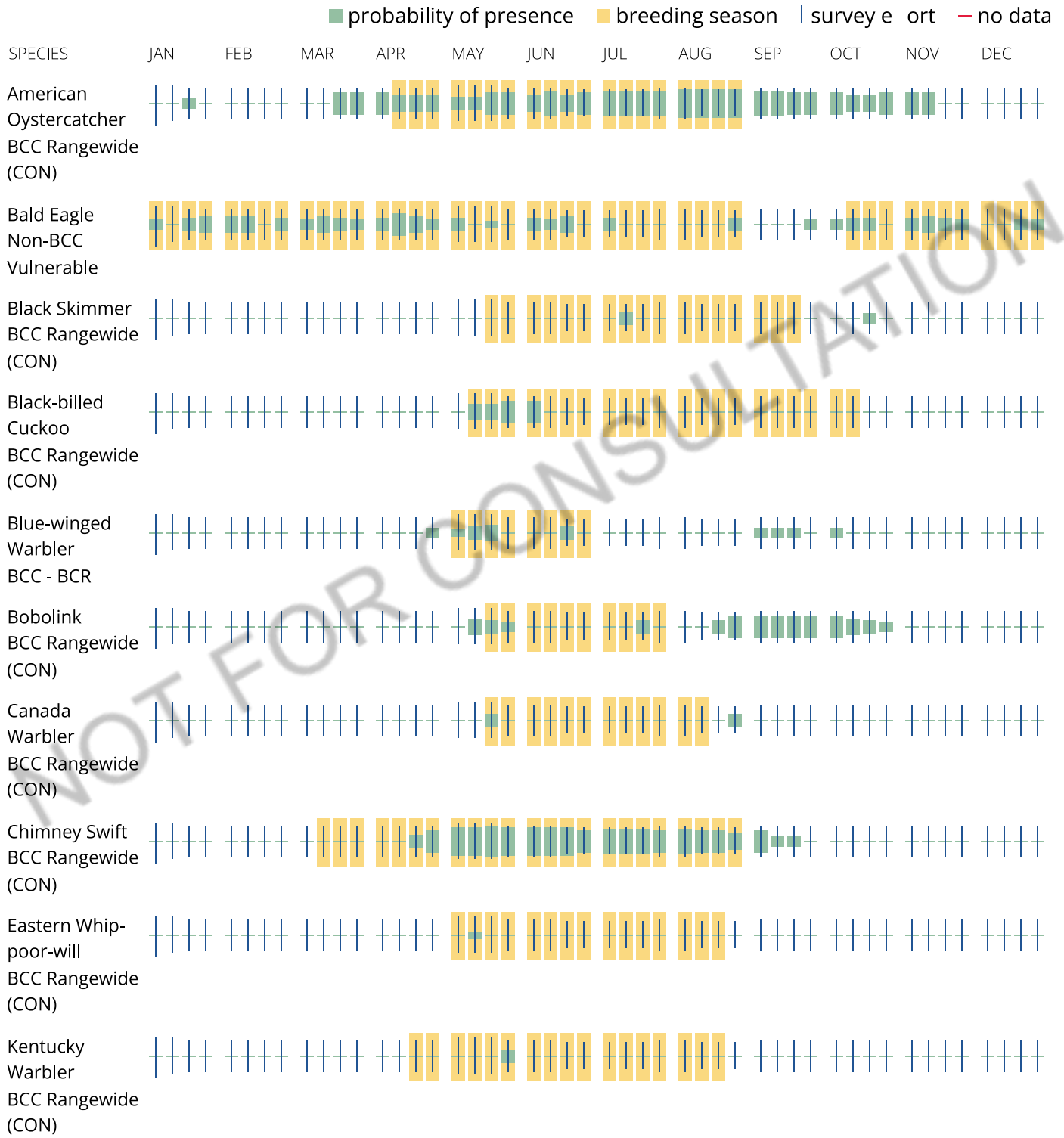
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

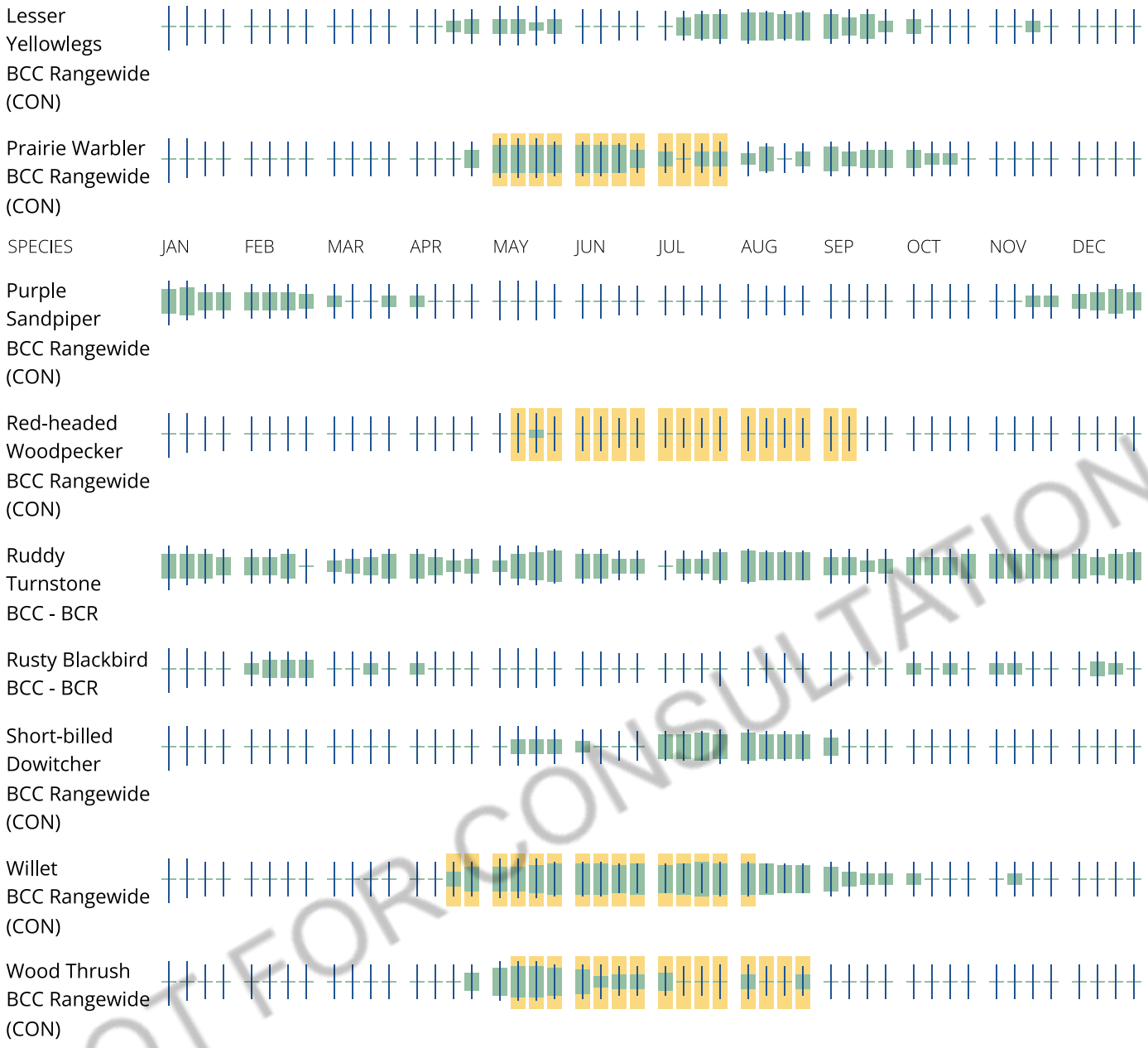
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA

Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should

seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

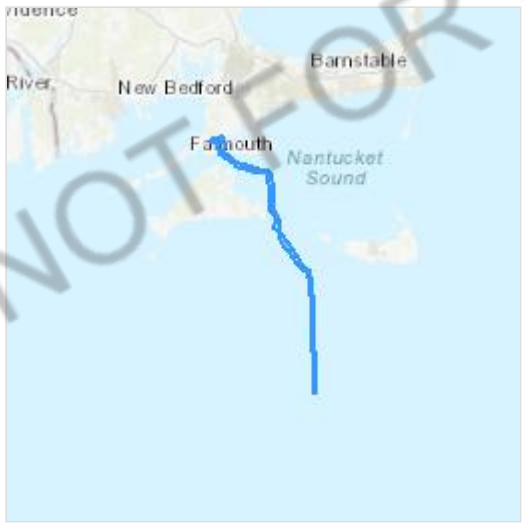
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Barnstable , Dukes , and Nantucket counties, Massachusetts



Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Flowering Plants

NAME	STATUS
Sandplain Gerardia Agalinis acuta Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8128	Endangered

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

Atlantic Pu n Fratercula arctica — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/8943

Black Guillemot Cepphus grylle — Breeds May 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Brown Pelican Pelecanus occidentalis — Breeds Jan 15 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Murre Uria aalge — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Cory's Shearwater Calonectris diomedea — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Double-crested Cormorant phalacrocorax auritus — Breeds Apr 20 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/3478

Dovekie Alle alle — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Great Shearwater Puffinus gravis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Manx Shearwater Puffinus puffinus — Breeds Apr 15 to Oct 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Razorbill Alca torda — Breeds Jun 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-necked Phalarope Phalaropus lobatus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Royal Tern Thalasseus maximus — Breeds Apr 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Wilson's Storm-petrel Oceanites oceanicus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events

for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
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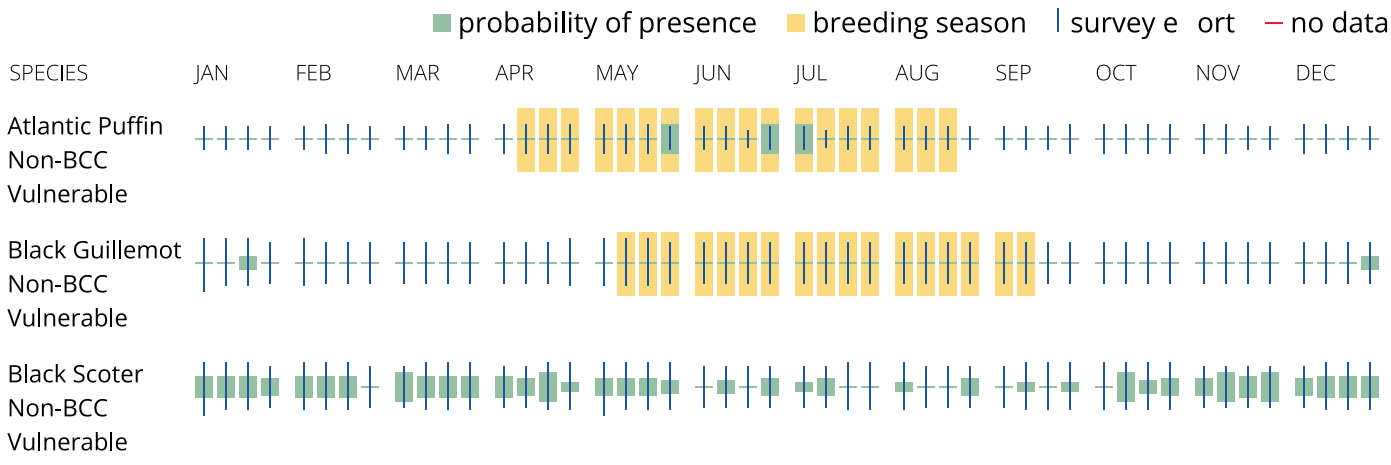

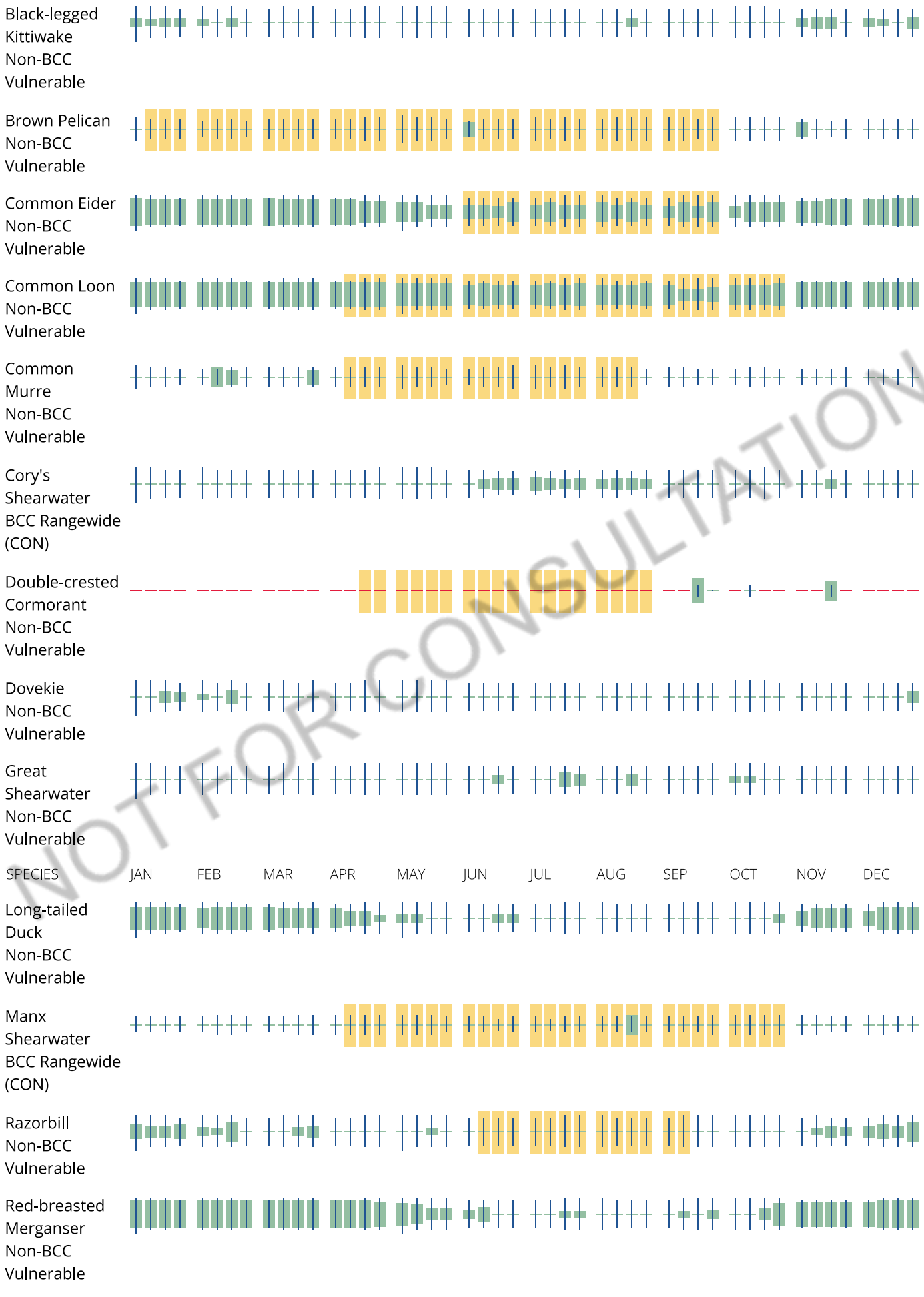

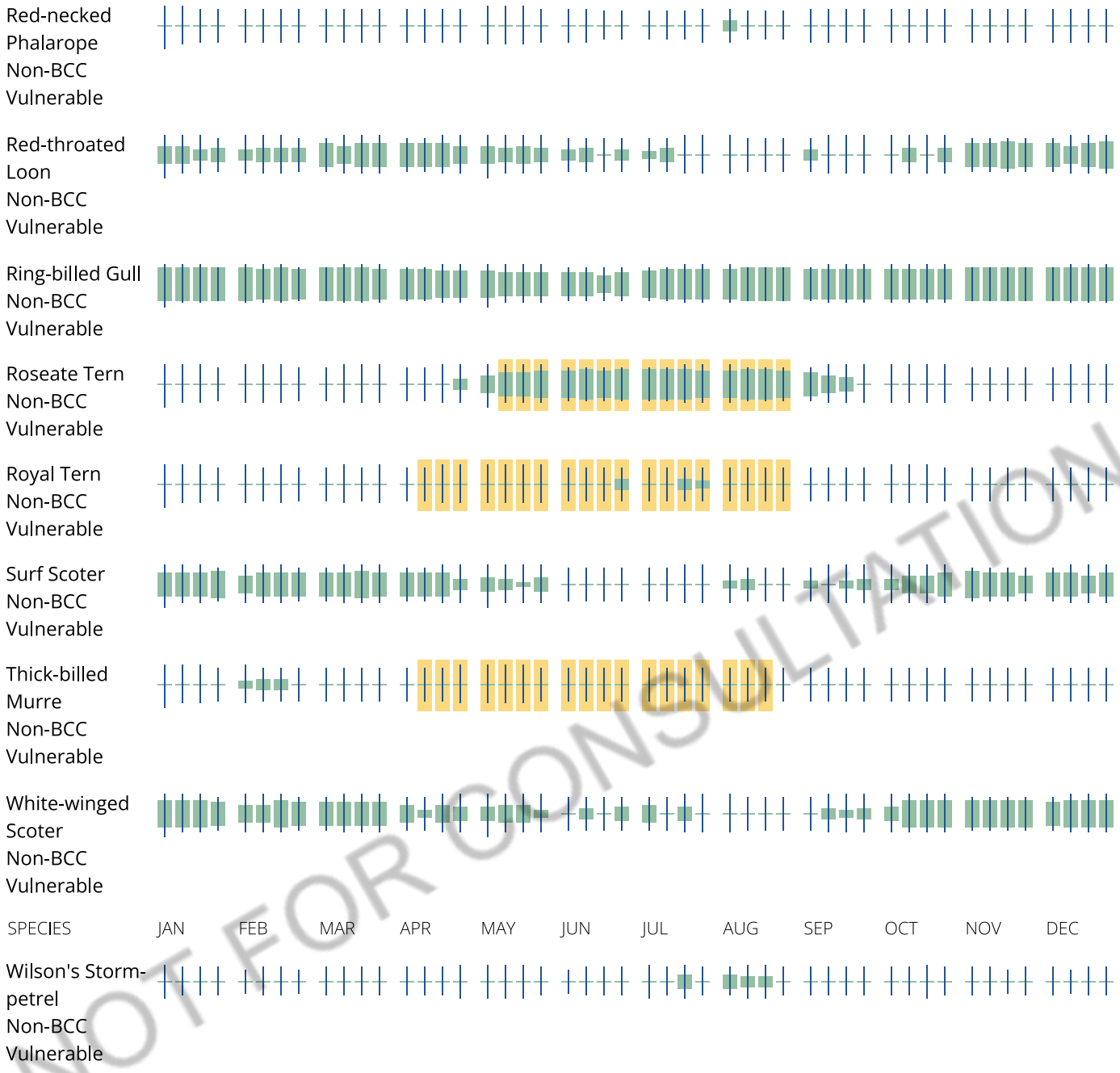

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Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and

minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more

information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should

seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

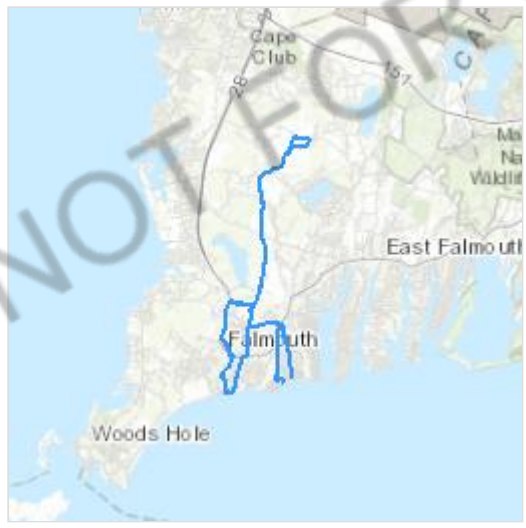
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Barnstable County, Massachusetts



Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Sandplain Gerardia Agalinis acuta Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8128	Endangered

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

American Oystercatcher Haematopus palliatus — Breeds Apr 15 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8935

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Guillemot Cepphus grylle — Breeds May 15 to Sep 10
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Cory's Shearwater Calonectris diomedea — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Dovekie Alle alle — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Great Shearwater Pu nus gravis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Kentucky Warbler Oporornis formosus — Breeds Apr 20 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa avipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Razorbill Alca torda — Breeds Jun 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-necked Phalarope Phalaropus lobatus — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Royal Tern Thalasseus maximus — Breeds Apr 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey

e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

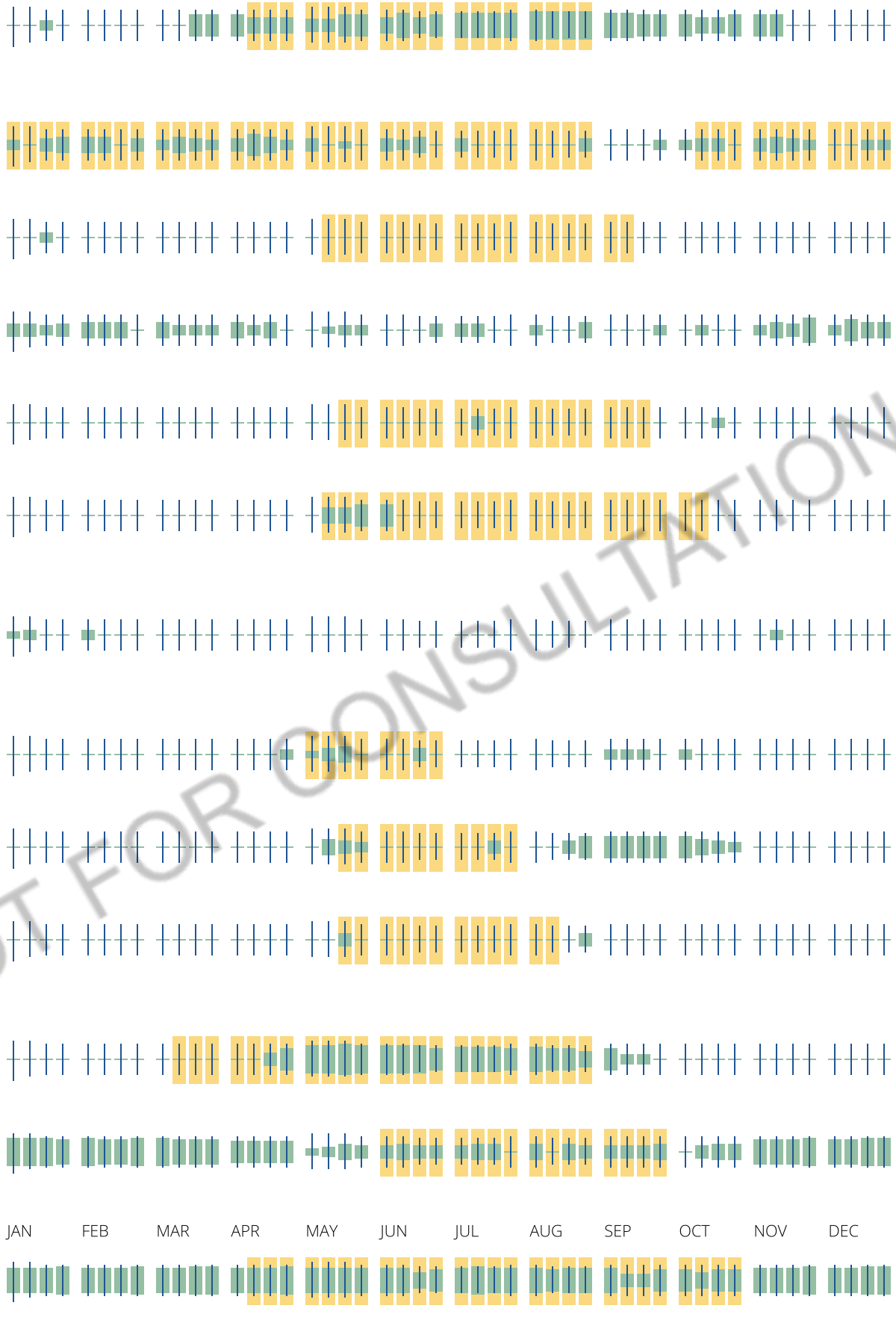
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

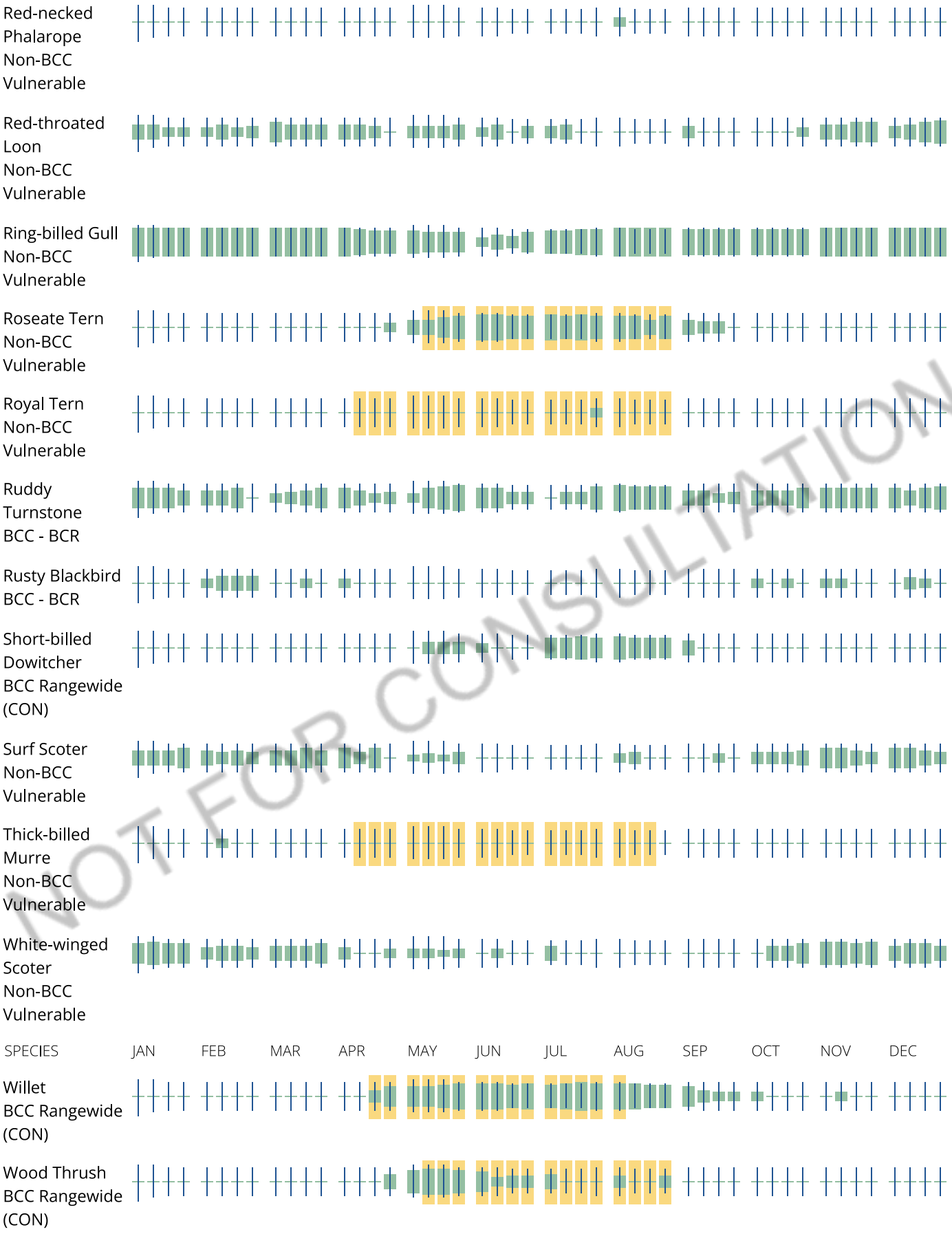
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey e ort – no data

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin

Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
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more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

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There are no known coastal barriers at this location.

Data limitations

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Data exclusions

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Fish hatcheries

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Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

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Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Barnstable County, Massachusetts

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Sandplain Gerardia Agalinis acuta Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8128	Endangered

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle *Haliaeetus leucocephalus* — Breeds Oct 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Skimmer *Rynchops niger* — Breeds May 20 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo *Coccyzus erythropthalmus* — Breeds May 15 to Oct 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler *Vermivora pinus* — Breeds May 1 to Jun 30

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink *Dolichonyx oryzivorus* — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler *Cardellina canadensis* — Breeds May 20 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift *Chaetura pelagica* — Breeds Mar 15 to Aug 25

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will *Antrostomus vociferus* — Breeds May 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Kentucky Warbler *Oporornis formosus* — Breeds Apr 20 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

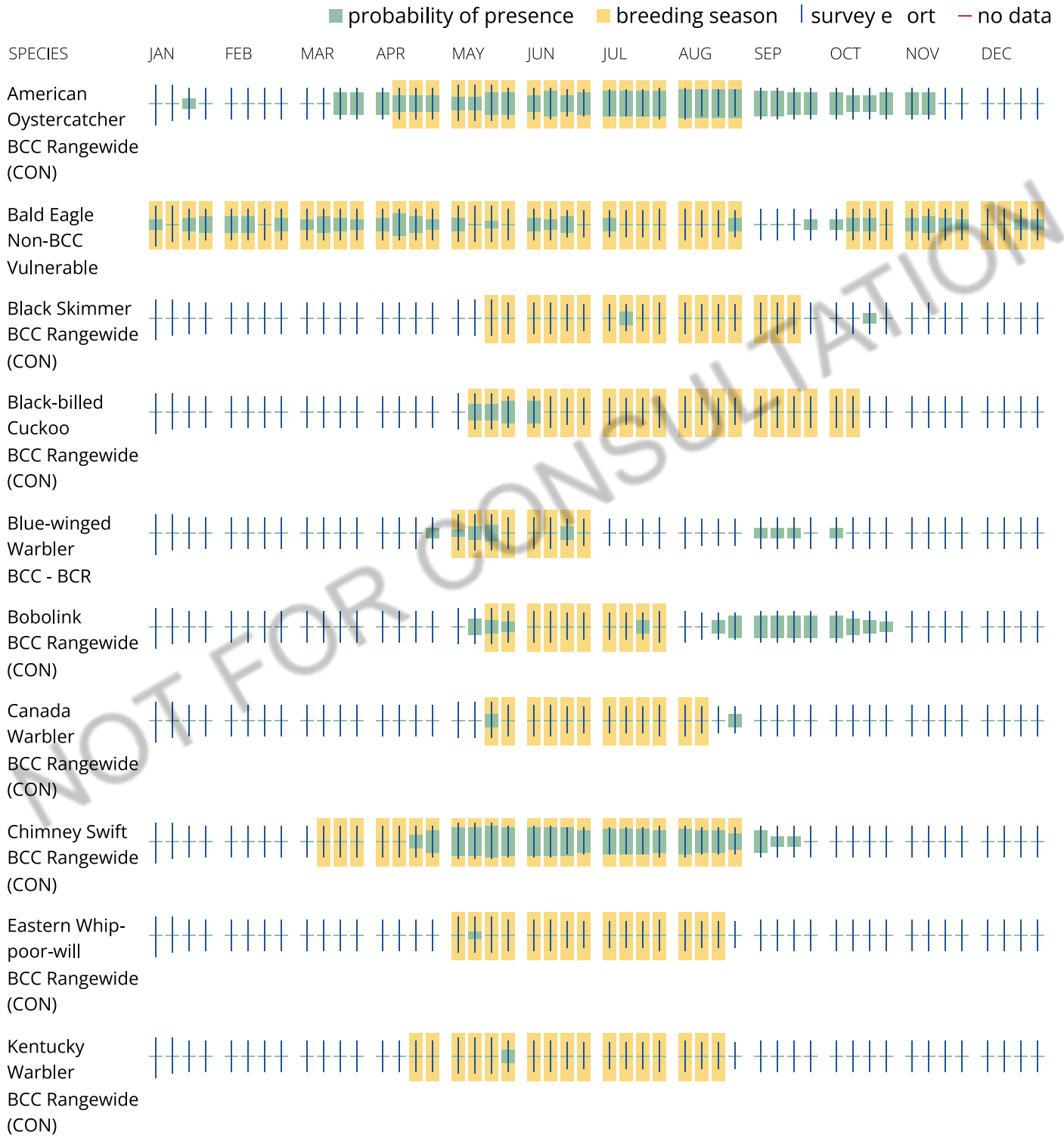
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

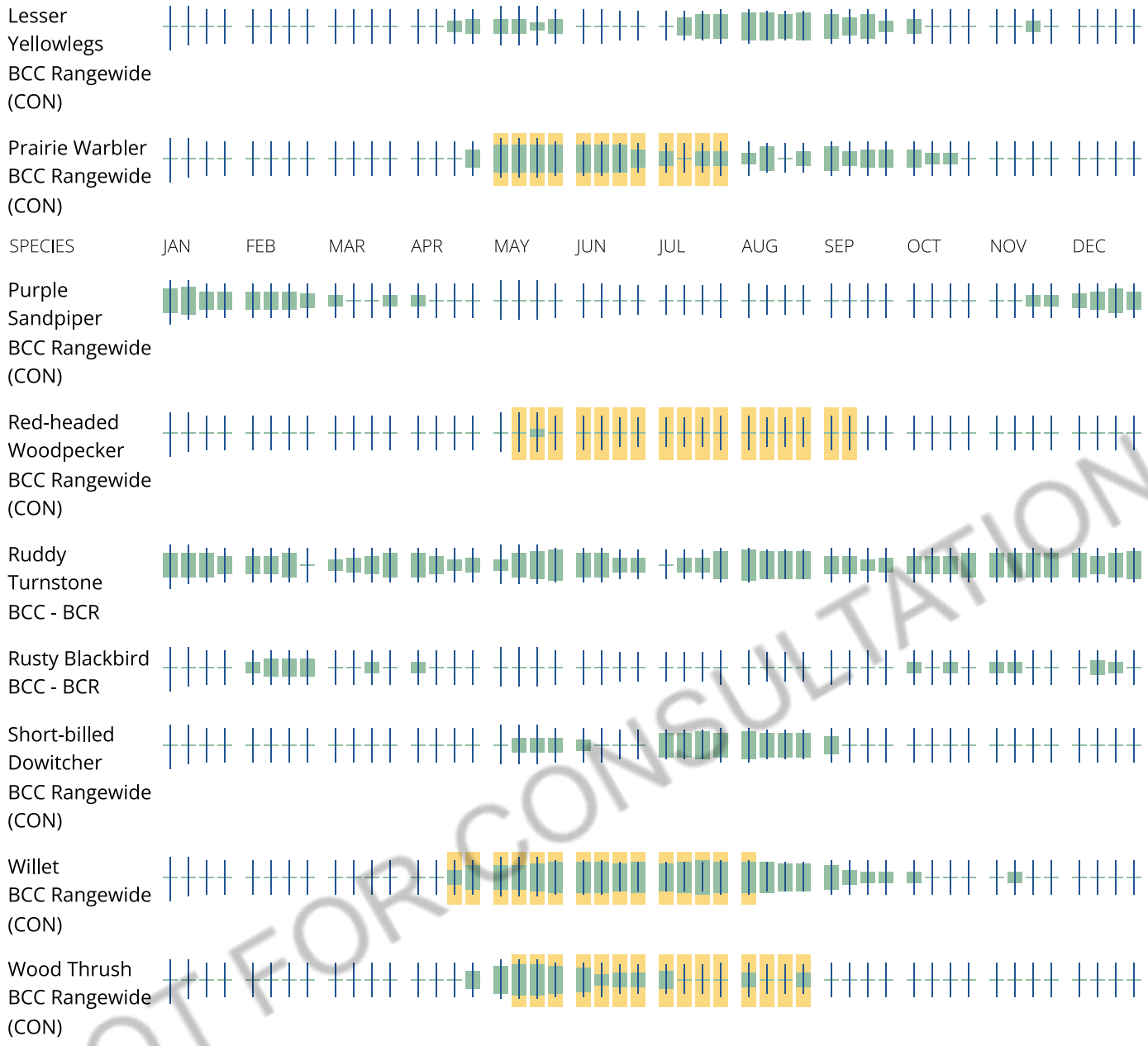
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
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Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Barnstable County, Massachusetts

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Sandplain Gerardia Agalinis acuta Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8128	Endangered

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Kentucky Warbler Oporornis formosus — Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

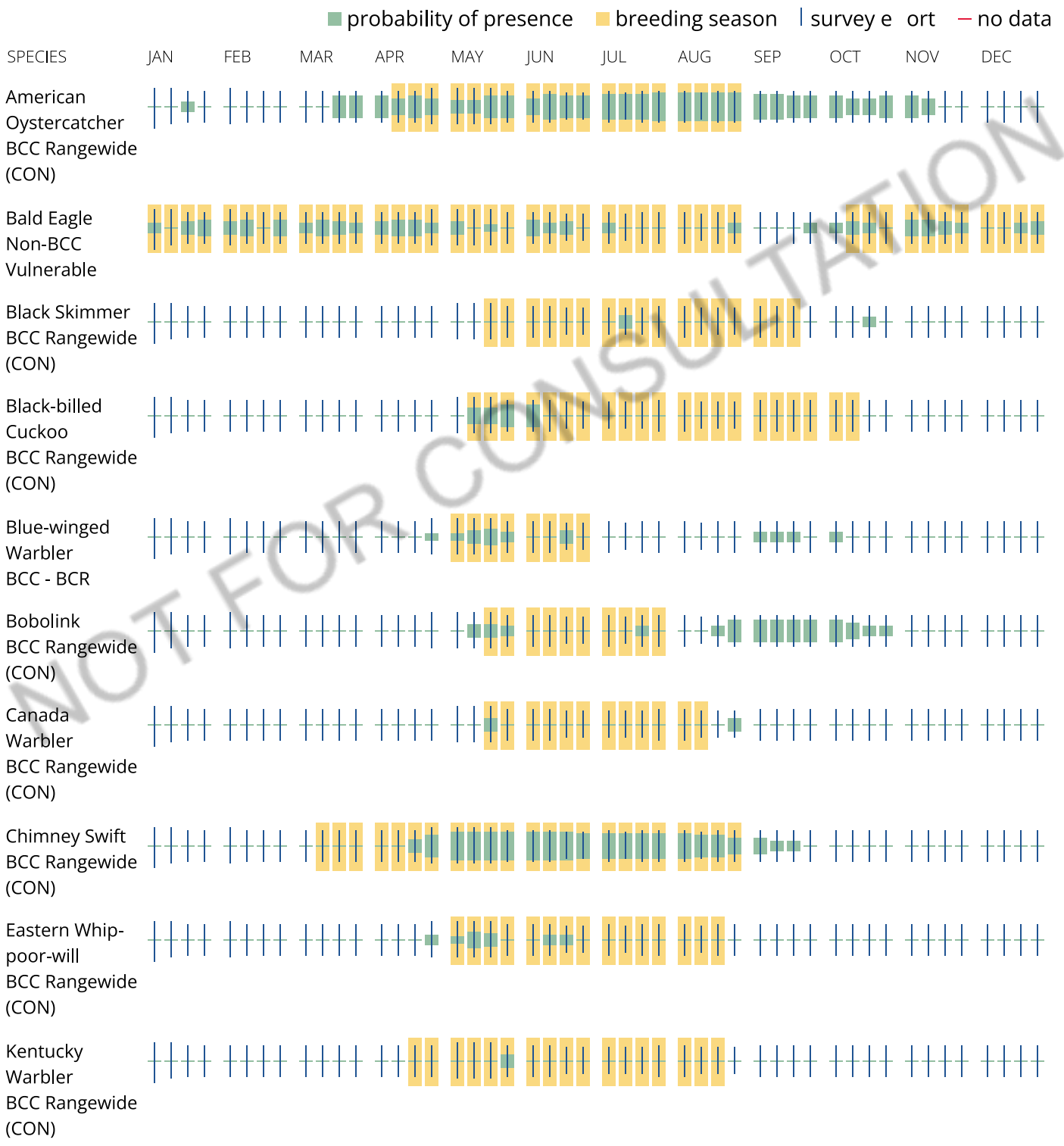
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

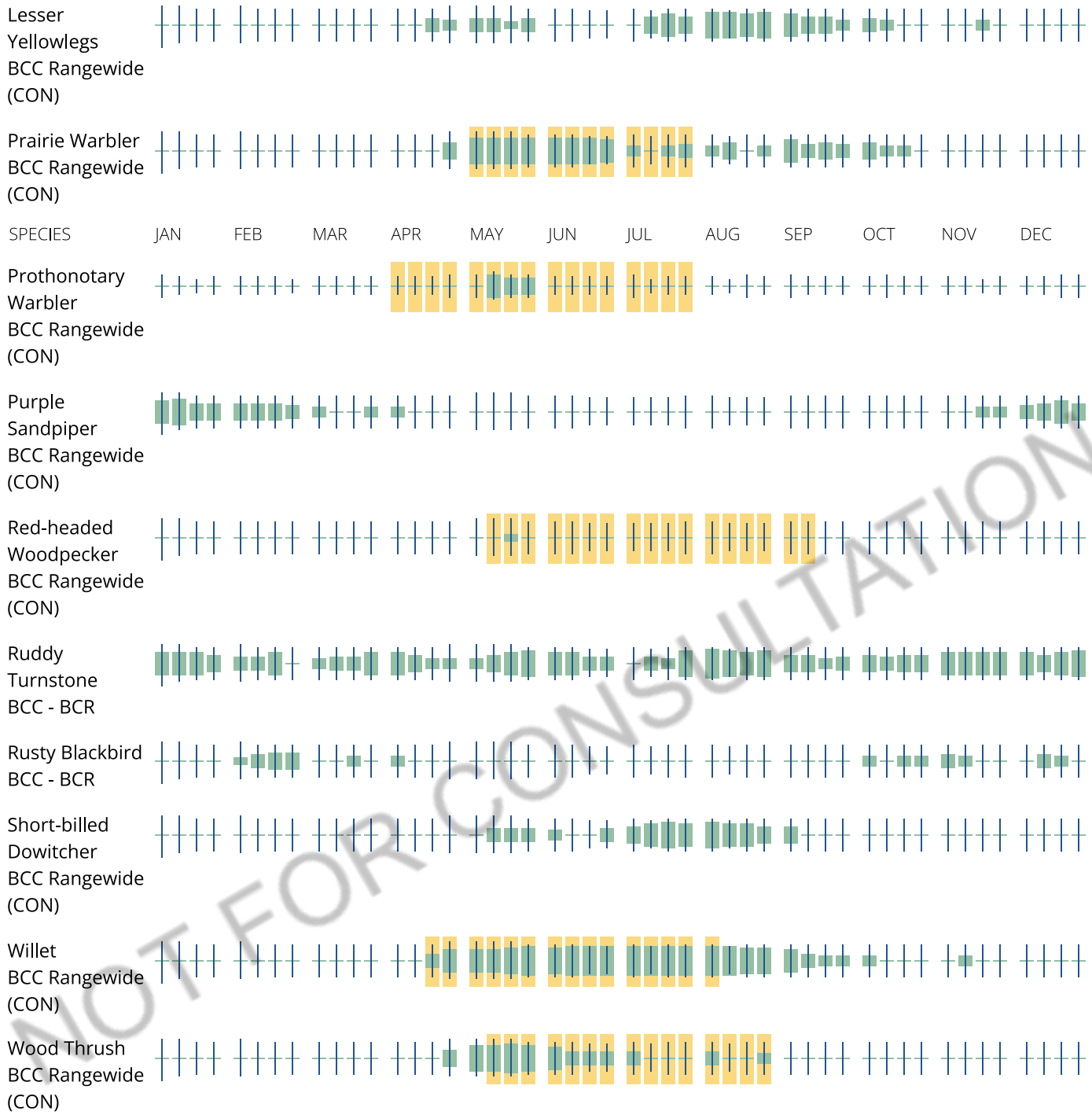
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

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Location

Newport County, Rhode Island

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

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The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Surf Scoter Melanitta perspicillata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

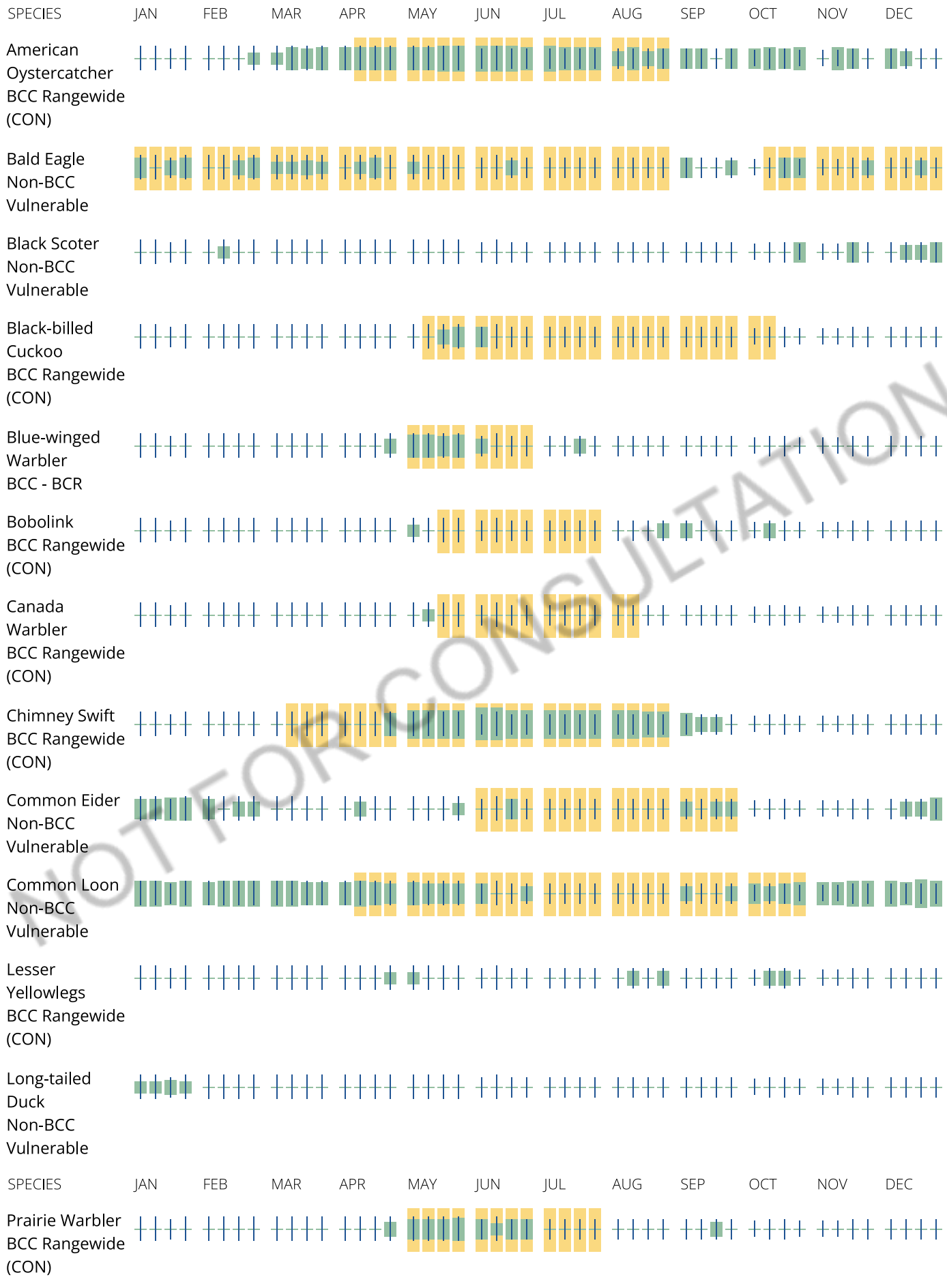
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

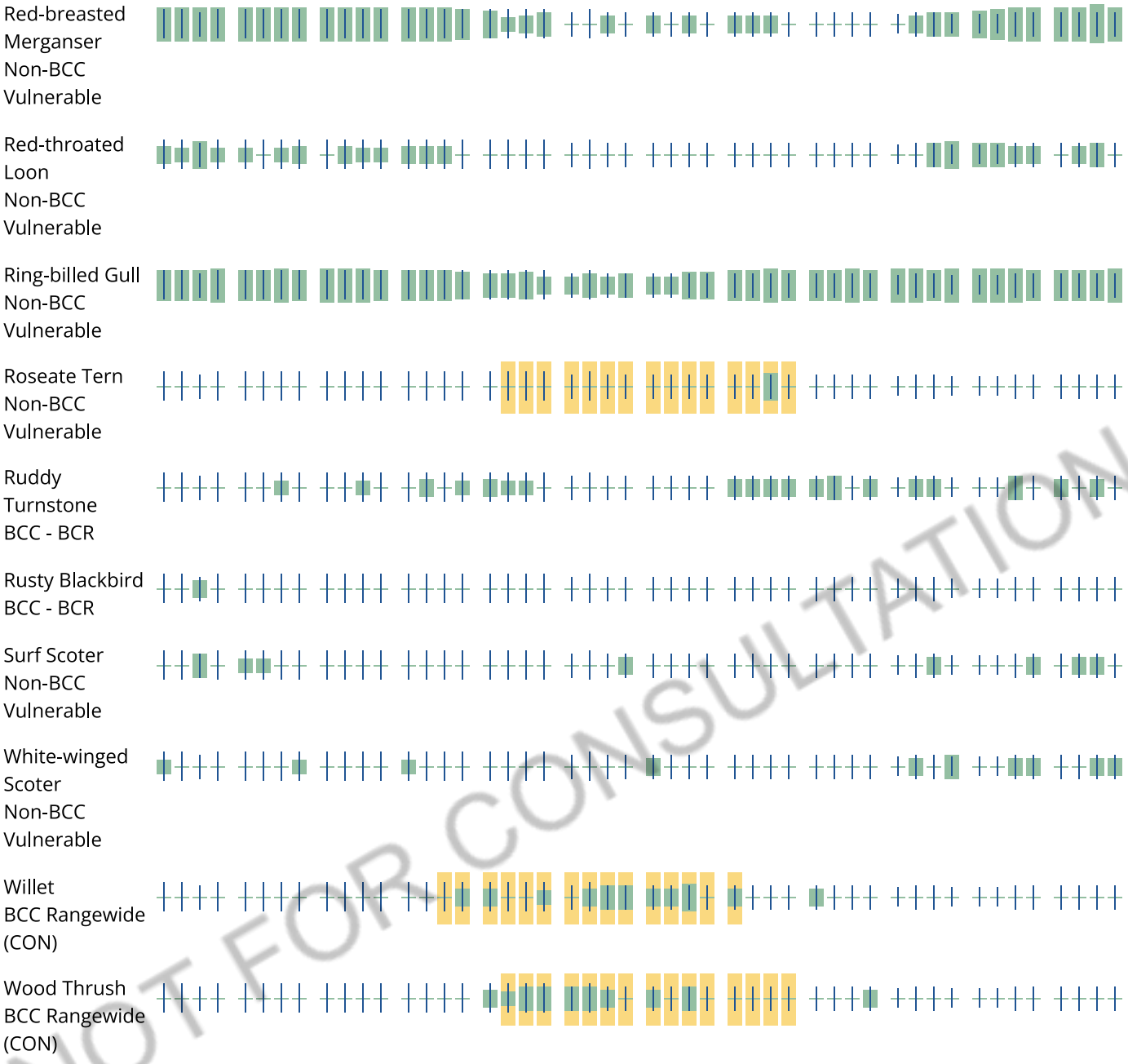
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey e ort – no data





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and

minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more

information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should

seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Newport County, Rhode Island

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
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Surf Scoter Melanitta perspicillata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere
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Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

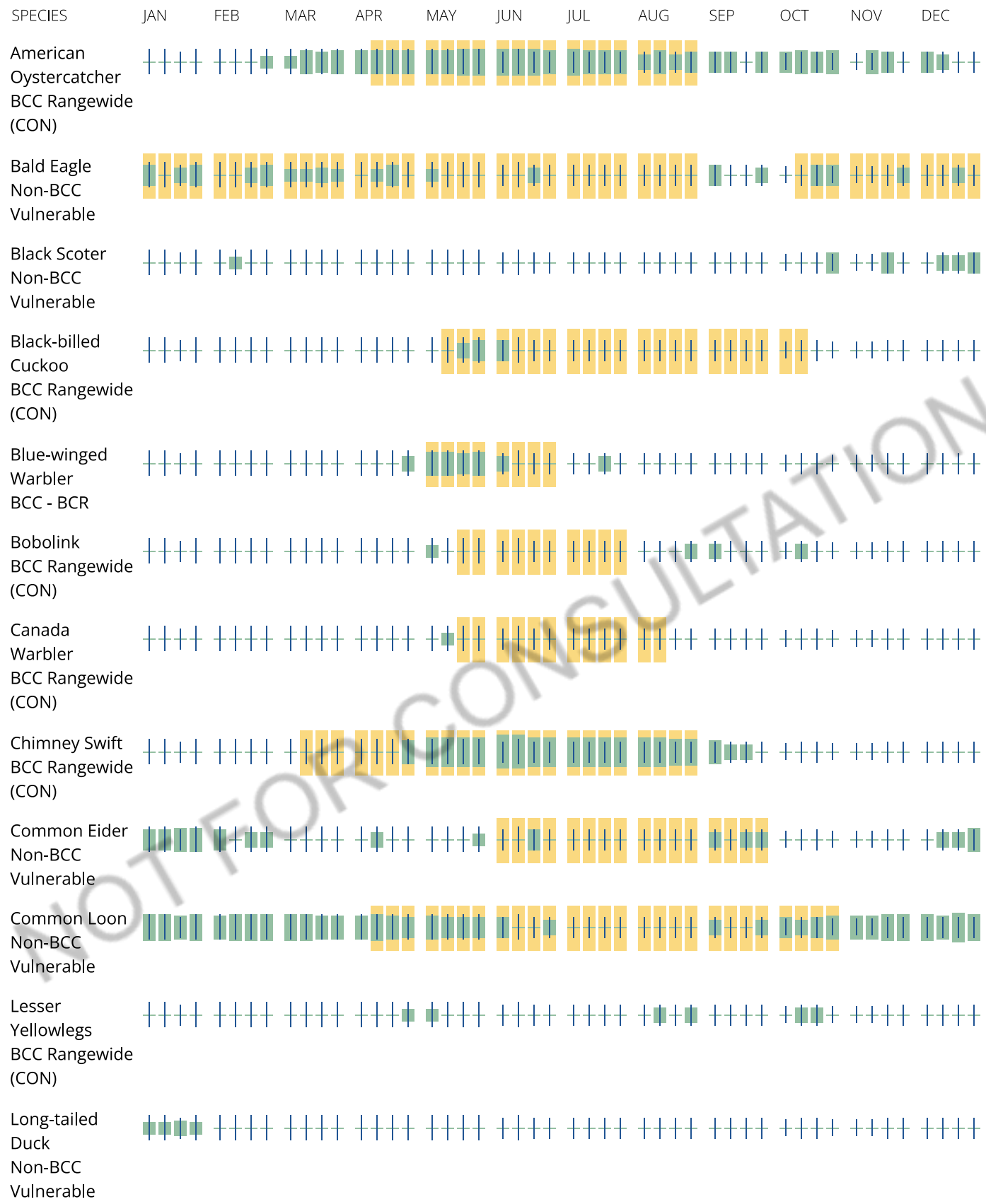
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

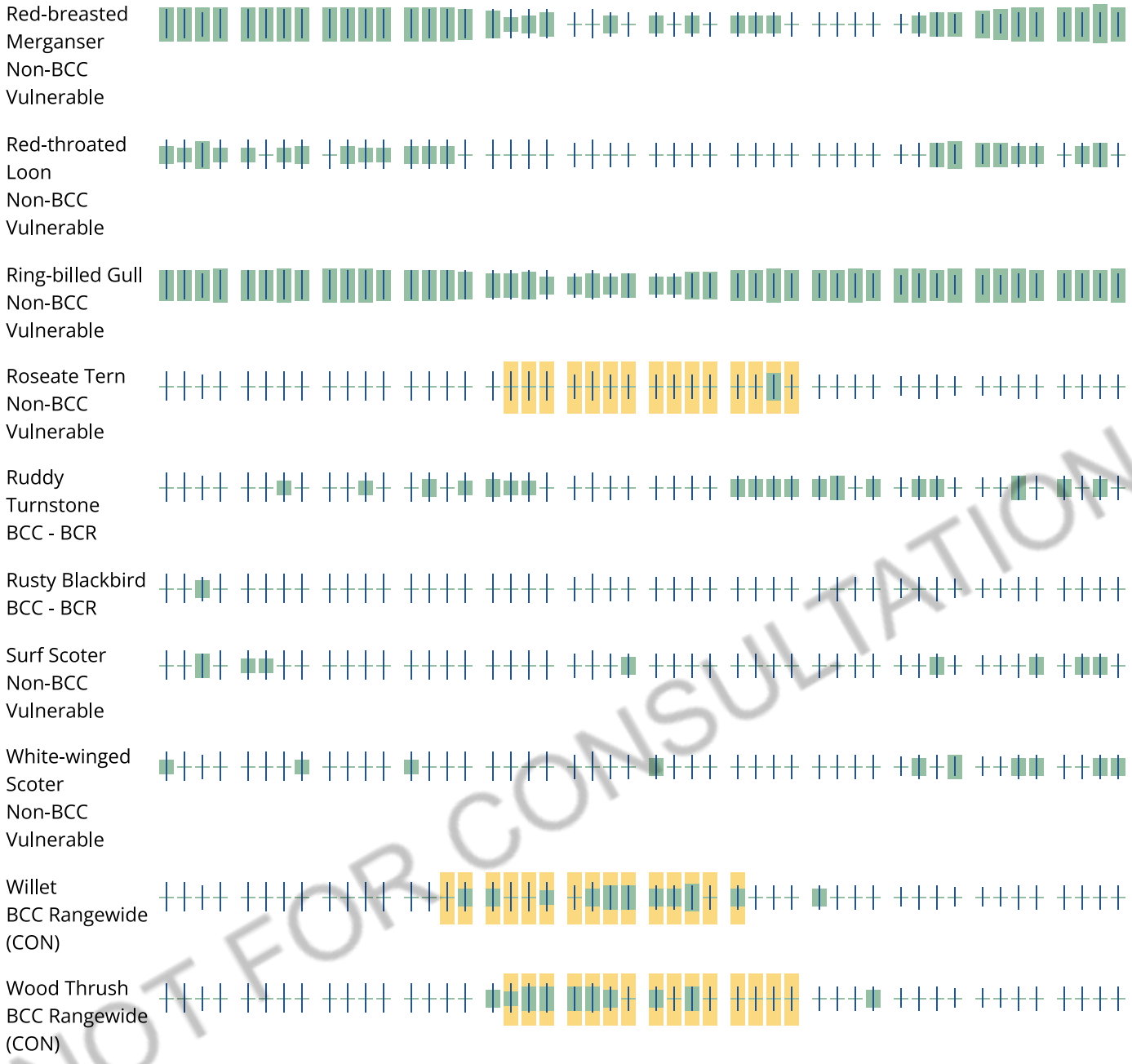
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey e ort – no data





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and

minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more

information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should

seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Newport County, Rhode Island

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Surf Scoter Melanitta perspicillata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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No Data (–)
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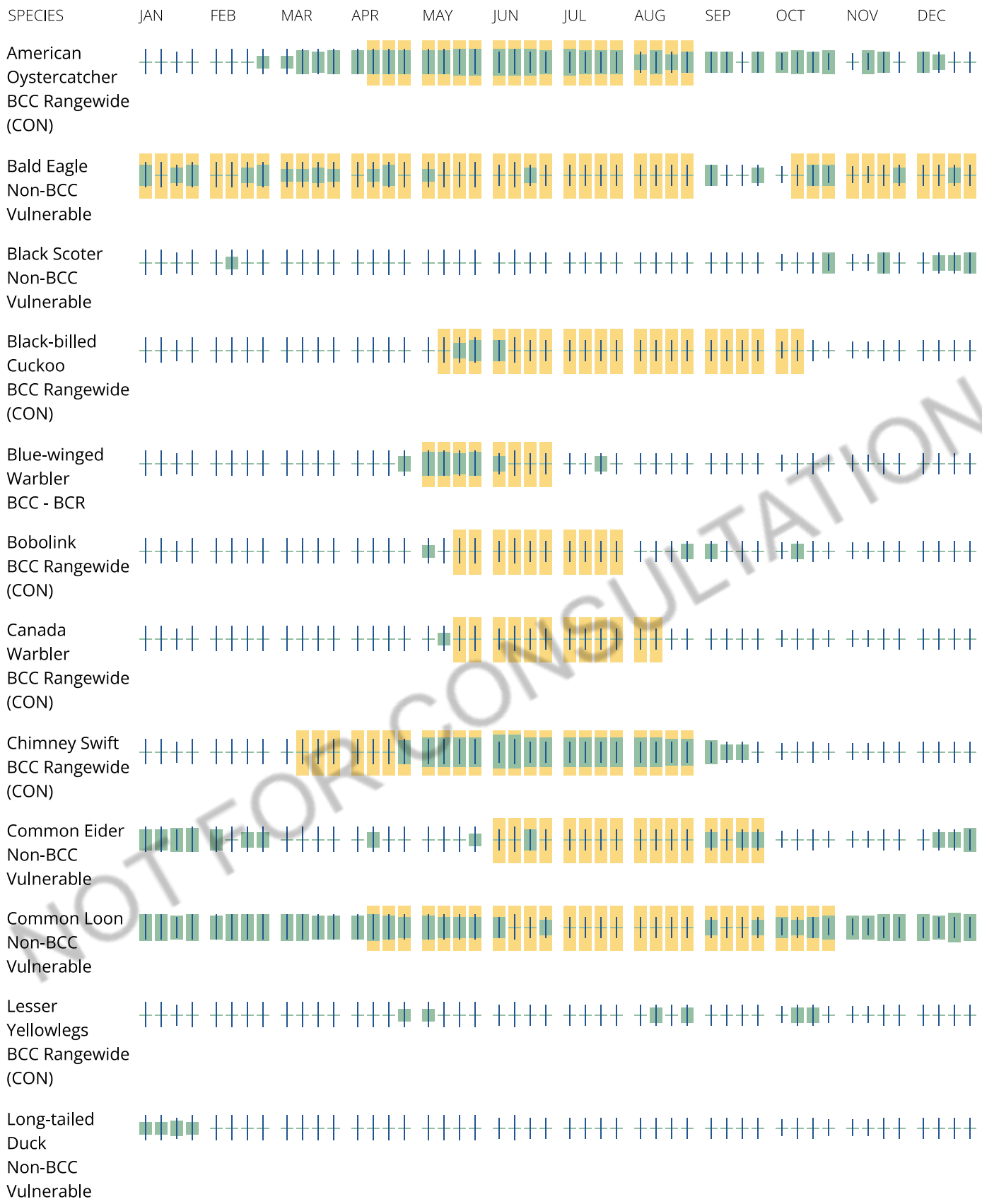
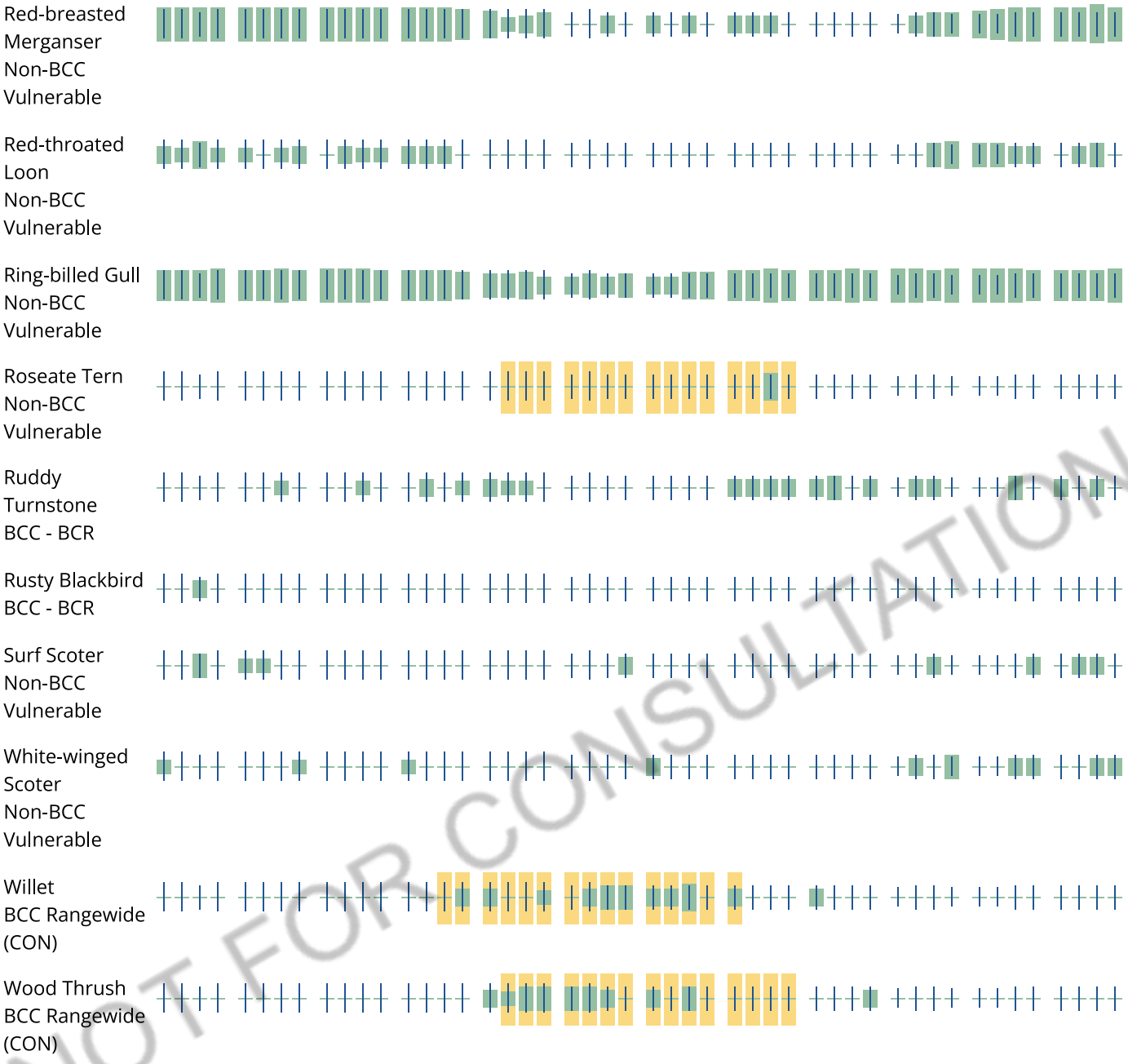
▪ probability of presence ▪ breeding season | survey e ort – no data





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Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

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To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

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1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and

minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more

information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

Wildlife refuges and fish hatcheries

Refuge and fish hatchery information is not available at this time

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Newport County, Rhode Island

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **nal** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black Guillemot Cepphus grylle This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.	Breeds May 15 to Sep 10
Black Scoter Melanitta nigra This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.	Breeds elsewhere
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Brown Pelican Pelecanus occidentalis — Breeds Jan 15 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6034

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Murre Uria aalge — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Cory's Shearwater Calonectris diomedea — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Dovekie Alle alle — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Great Shearwater Pu nus gravis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa avipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Manx Shearwater Pu nus pu nus — Breeds Apr 15 to Oct 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Pomarine Jaeger Stercorarius pomarinus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Razorbill Alca torda — Breeds Jun 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Royal Tern Thalasseus maximus — Breeds Apr 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wilson's Storm-petrel Oceanites oceanicus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

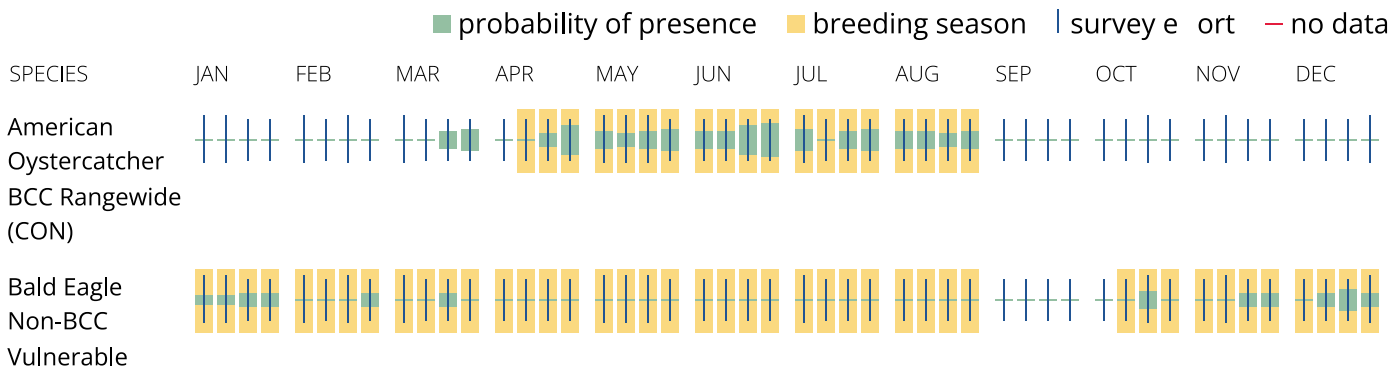
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

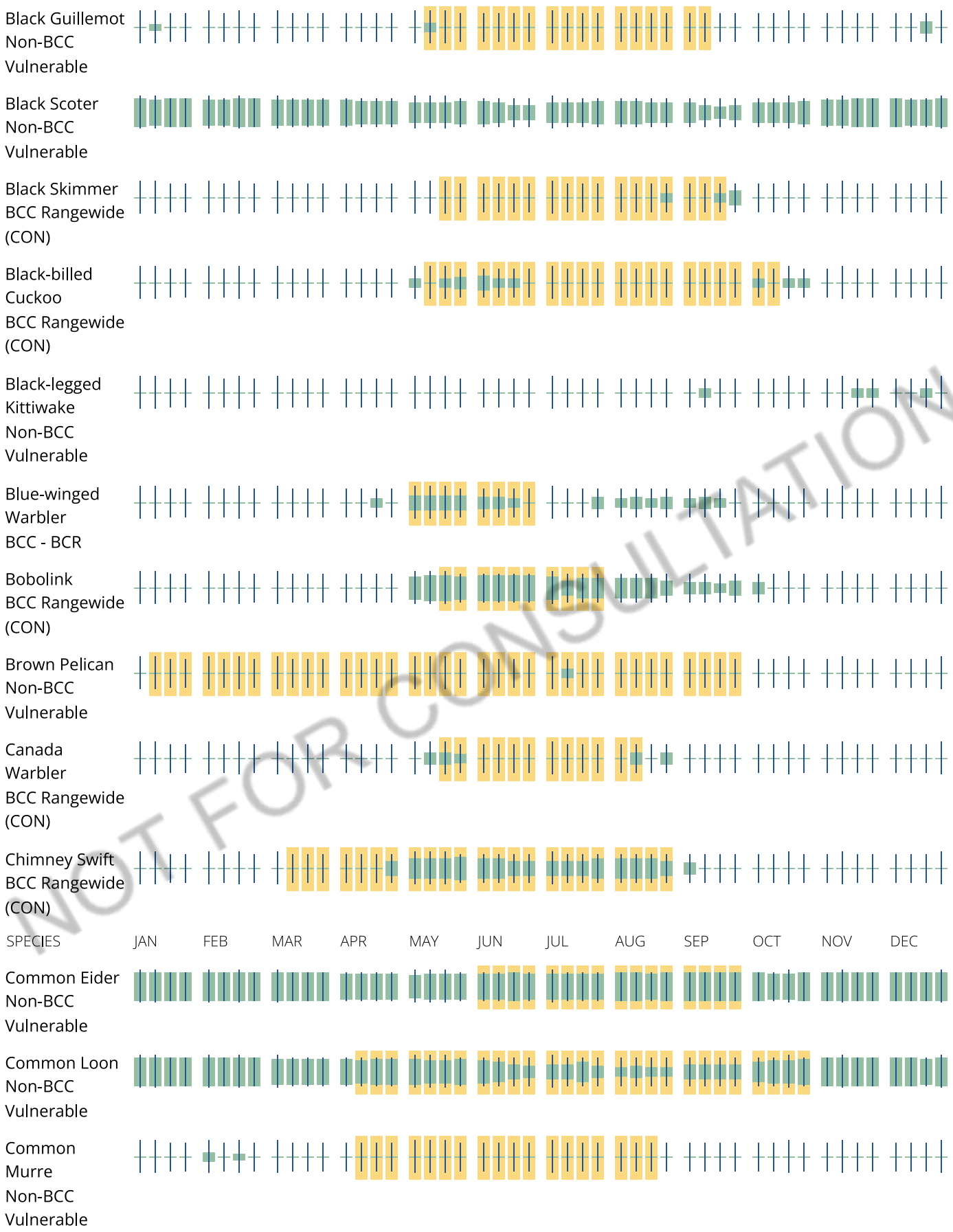
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

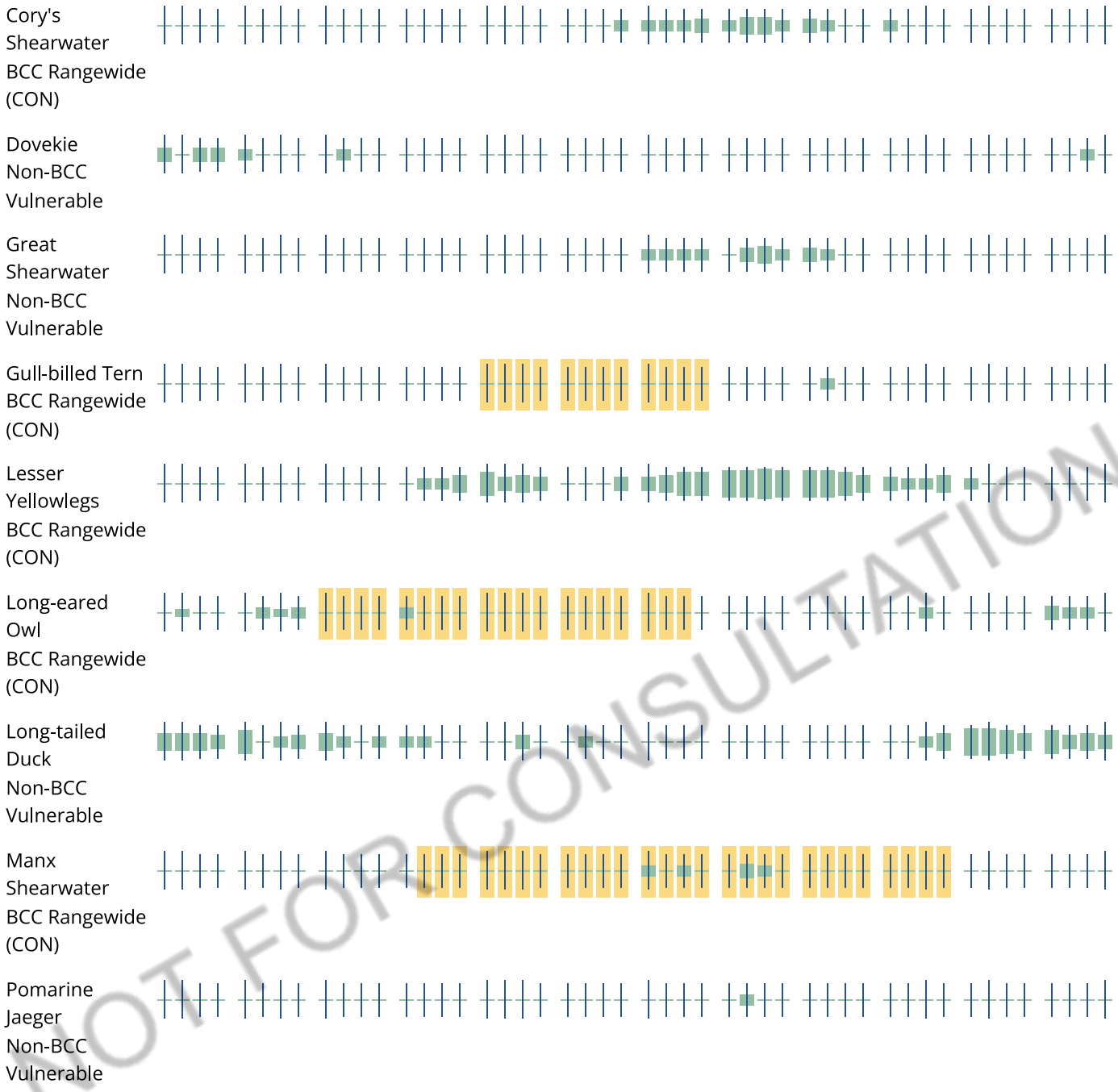
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

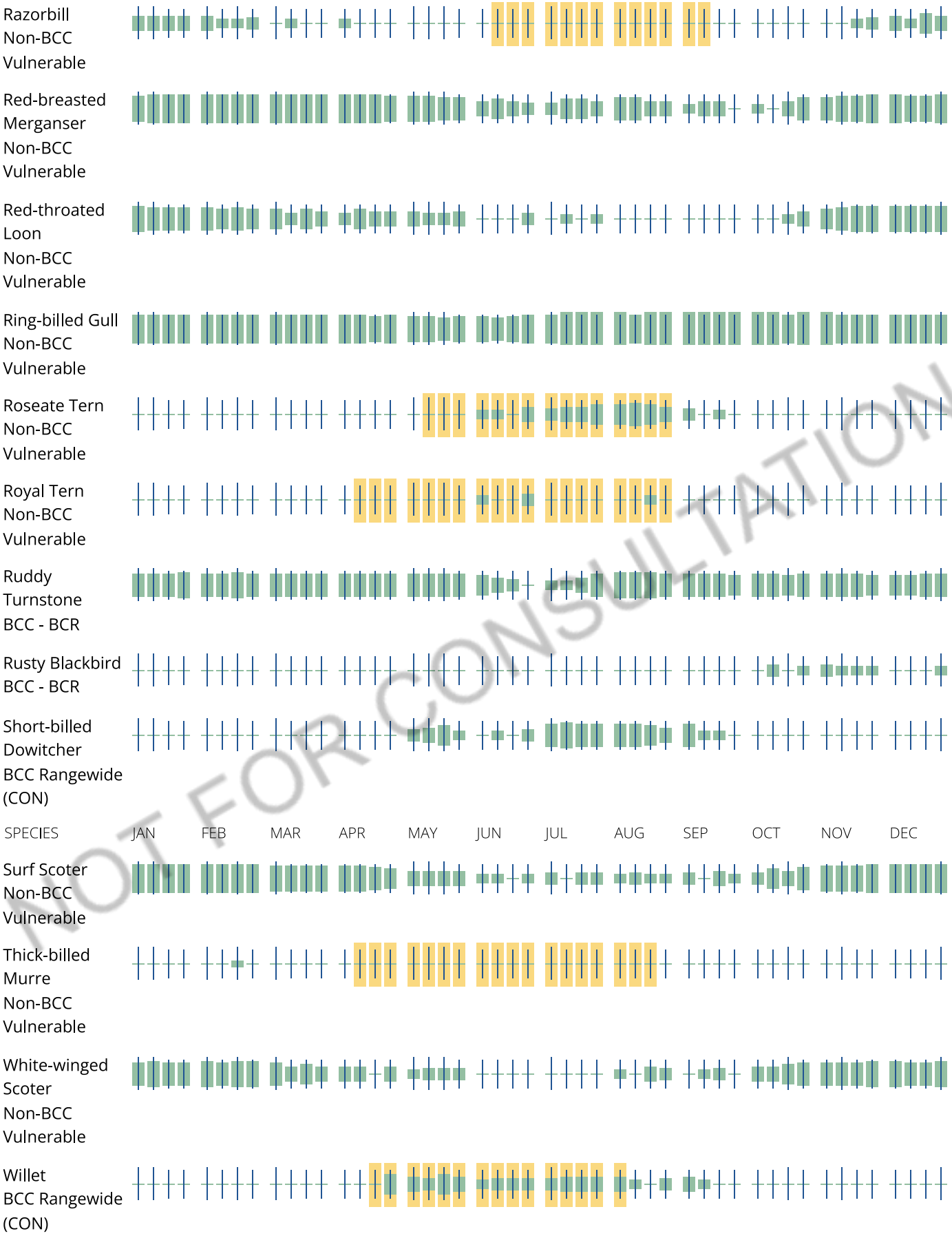
No Data (–)
A week is marked as having no data if there were no survey events for that week.

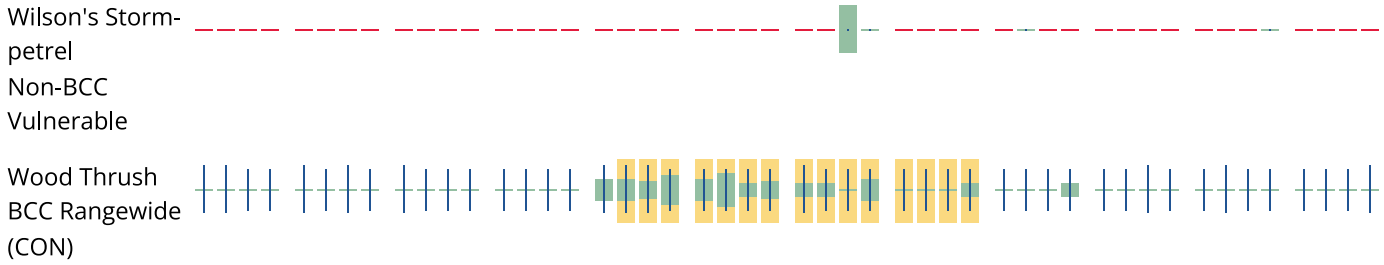
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.











Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory

birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

This location overlaps the following CBRS unit(s):

Otherwise Protected Area (OPA)

OPAs are denoted with a "P" at the end of the unit number. The only prohibition within OPAs is on federal flood insurance. ***CBRA consultation is not required for projects within OPAs.*** *However, agencies providing disaster assistance that is contingent upon a requirement to purchase flood insurance after the fact are advised to disclose the OPA designation and information on the restrictions on Federal flood insurance to the recipient prior to the commitments of funds.*

RI-04P - FI 11/16/1991

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a

hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER

Marine

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Newport County, Rhode Island

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle *Haliaeetus leucocephalus* — Breeds Oct 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Guillemot *Cepphus grylle* — Breeds May 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter *Melanitta nigra* — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Skimmer *Rynchops niger* — Breeds May 20 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo *Coccyzus erythropthalmus* — Breeds May 15 to Oct 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Black-legged Kittiwake *Rissa tridactyla* — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Blue-winged Warbler *Vermivora pinus* — Breeds May 1 to Jun 30

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink *Dolichonyx oryzivorus* — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Brown Pelican Pelecanus occidentalis — Breeds Jan 15 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6034

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Murre Uria aalge — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Cory's Shearwater Calonectris diomedea — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Dovekie Alle alle — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Great Shearwater Pu nus gravis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa avipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Manx Shearwater Pu nus pu nus — Breeds Apr 15 to Oct 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Pomarine Jaeger Stercorarius pomarinus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Razorbill Alca torda — Breeds Jun 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Royal Tern Thalasseus maximus — Breeds Apr 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

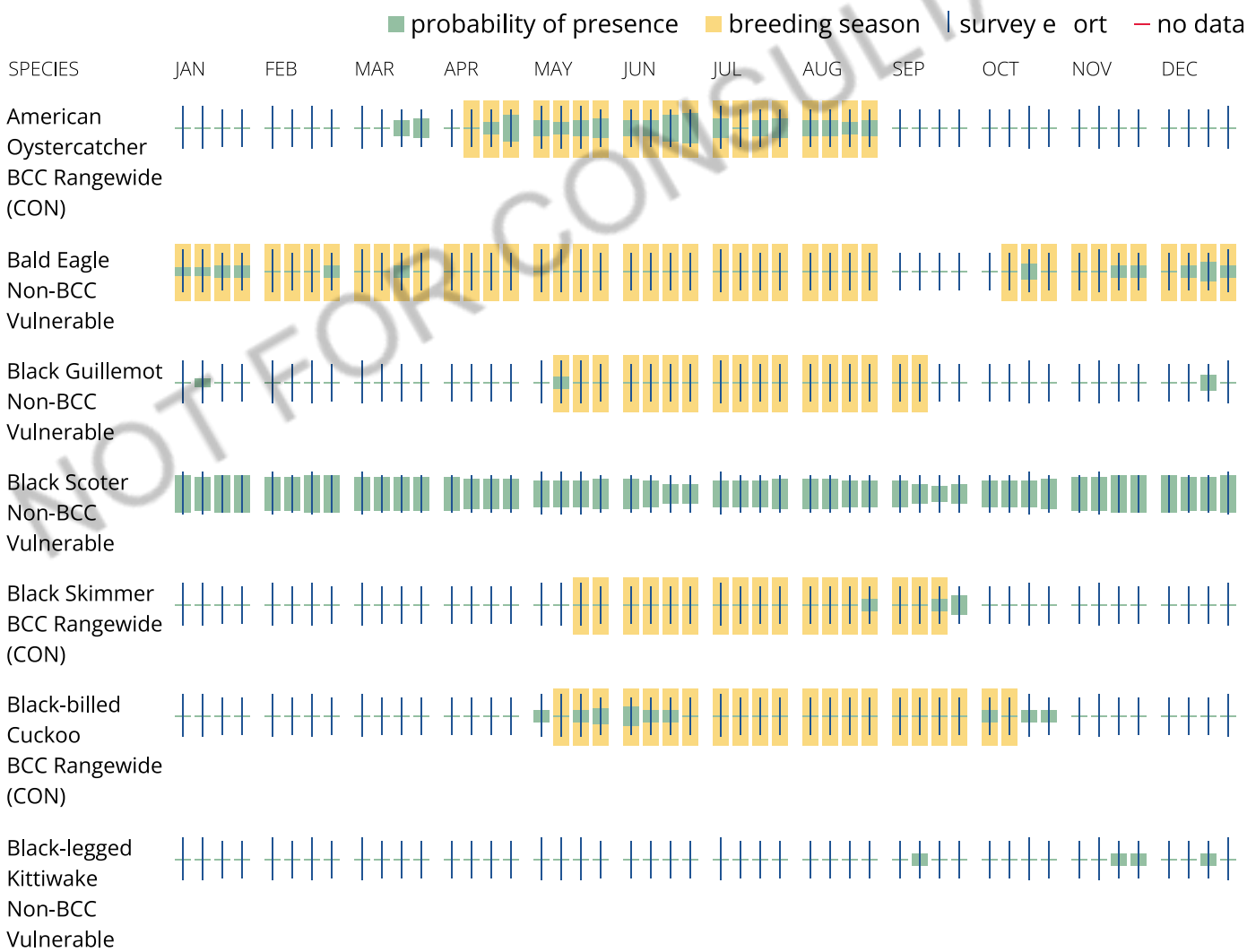
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

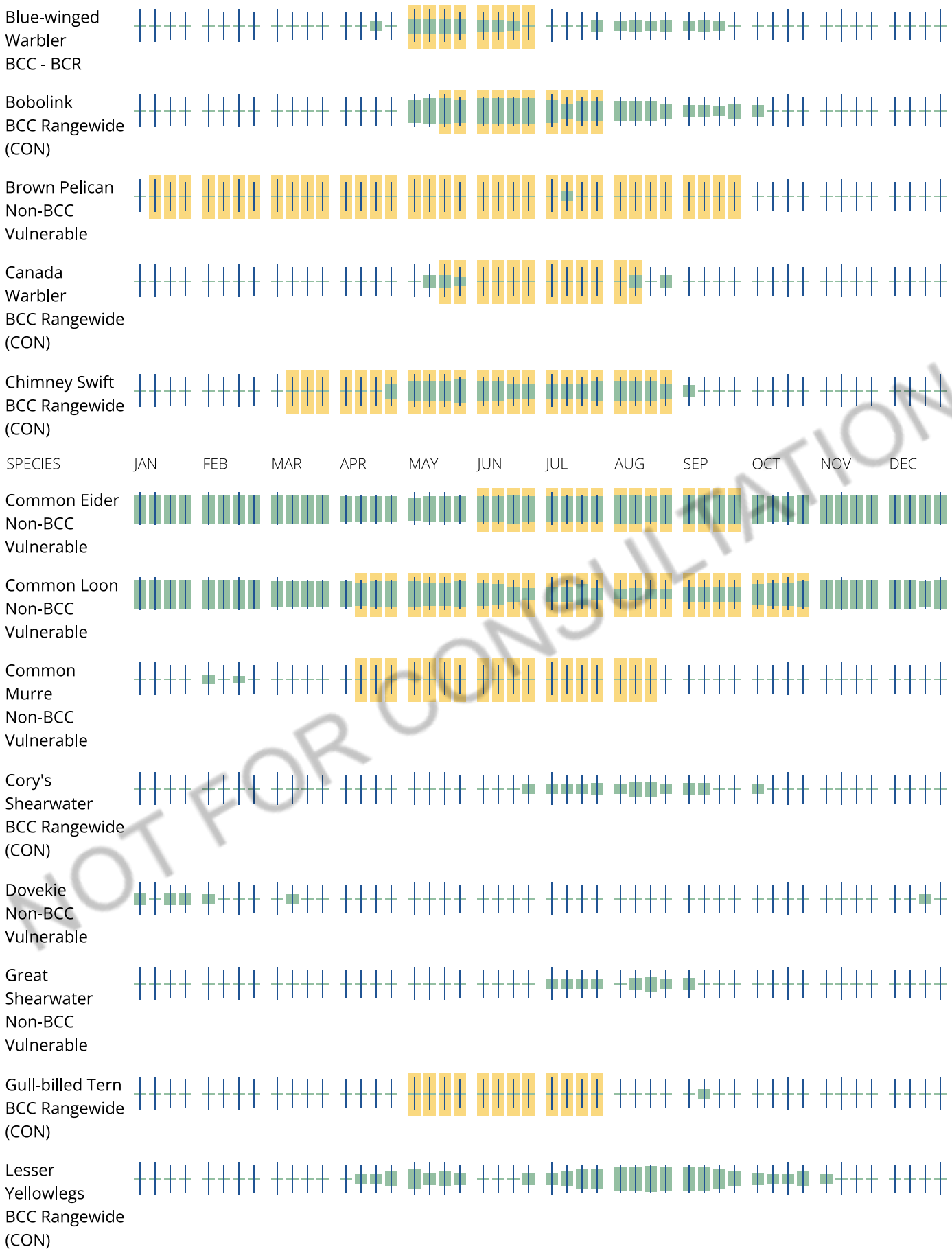
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

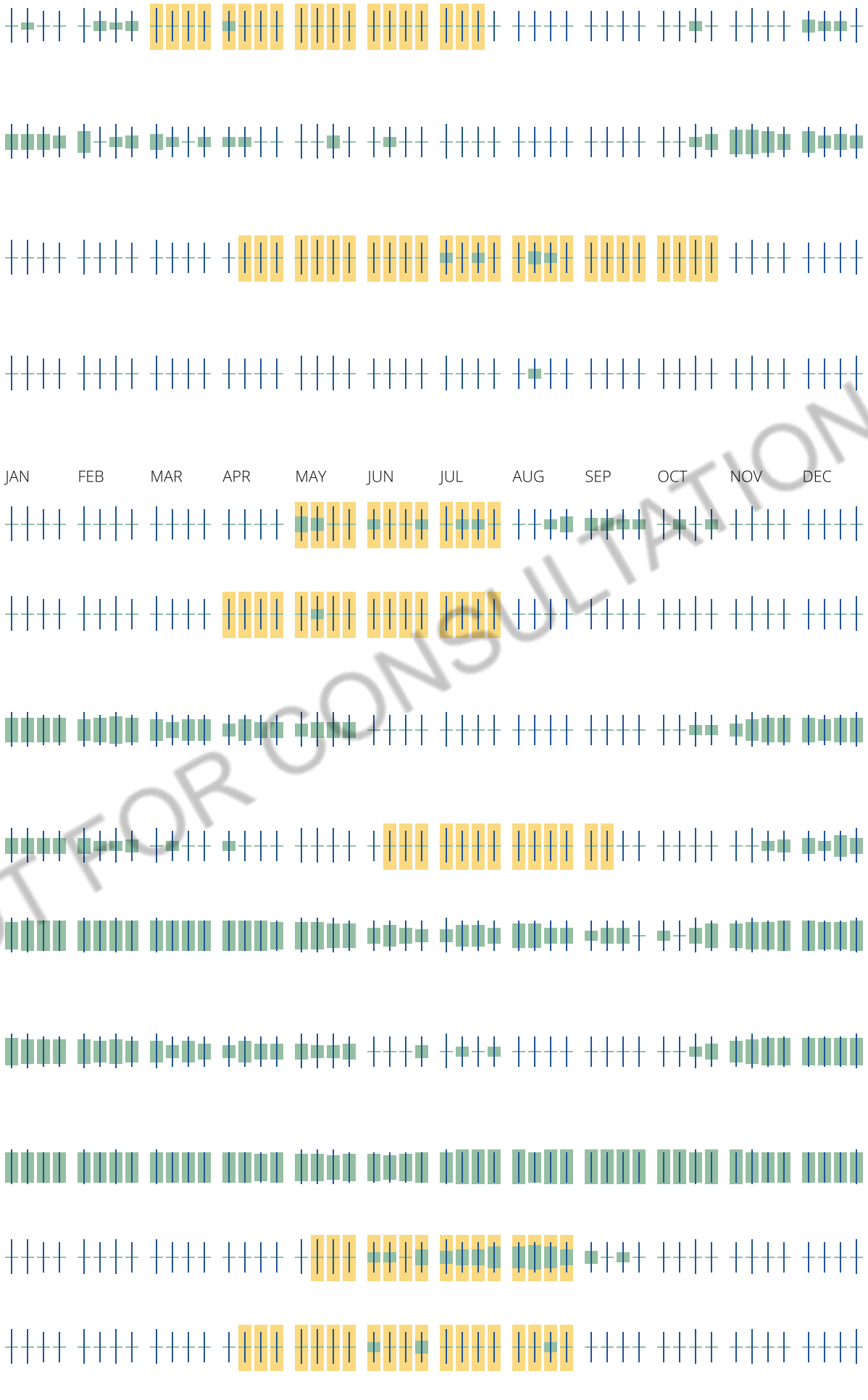
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

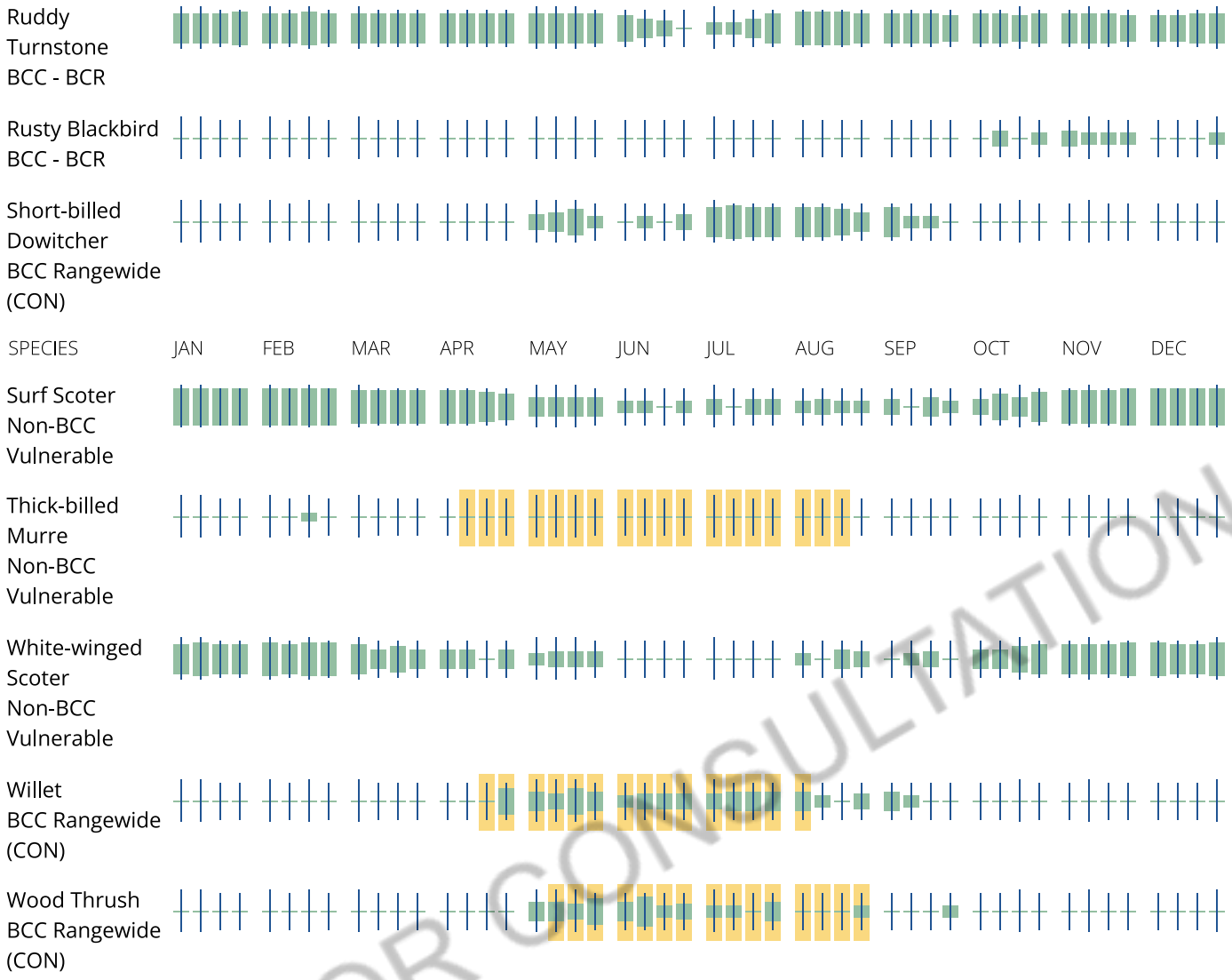
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.









Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid

cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

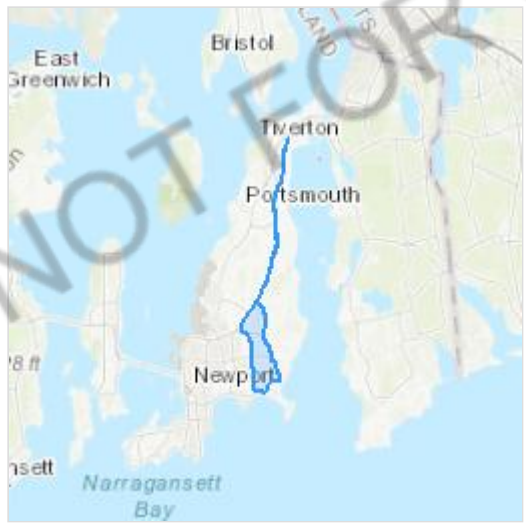
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Newport County, Rhode Island



Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

American Oystercatcher Haematopus palliatus — Breeds Apr 15 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8935

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Guillemot Cepphus grylle — Breeds May 15 to Sep 10
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Brown Pelican Pelecanus occidentalis — Breeds Jan 15 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Murre Uria aalge — Breeds Apr 15 to Aug 15
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Cory's Shearwater Calonectris diomedea — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Dovekie Alle alle — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Great Shearwater Pu nus gravis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa avipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Manx Shearwater Pu nus pu nus — Breeds Apr 15 to Oct 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Pomarine Jaeger Stercorarius pomarinus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Razorbill Alca torda — Breeds Jun 15 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Royal Tern Thalasseus maximus — Breeds Apr 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

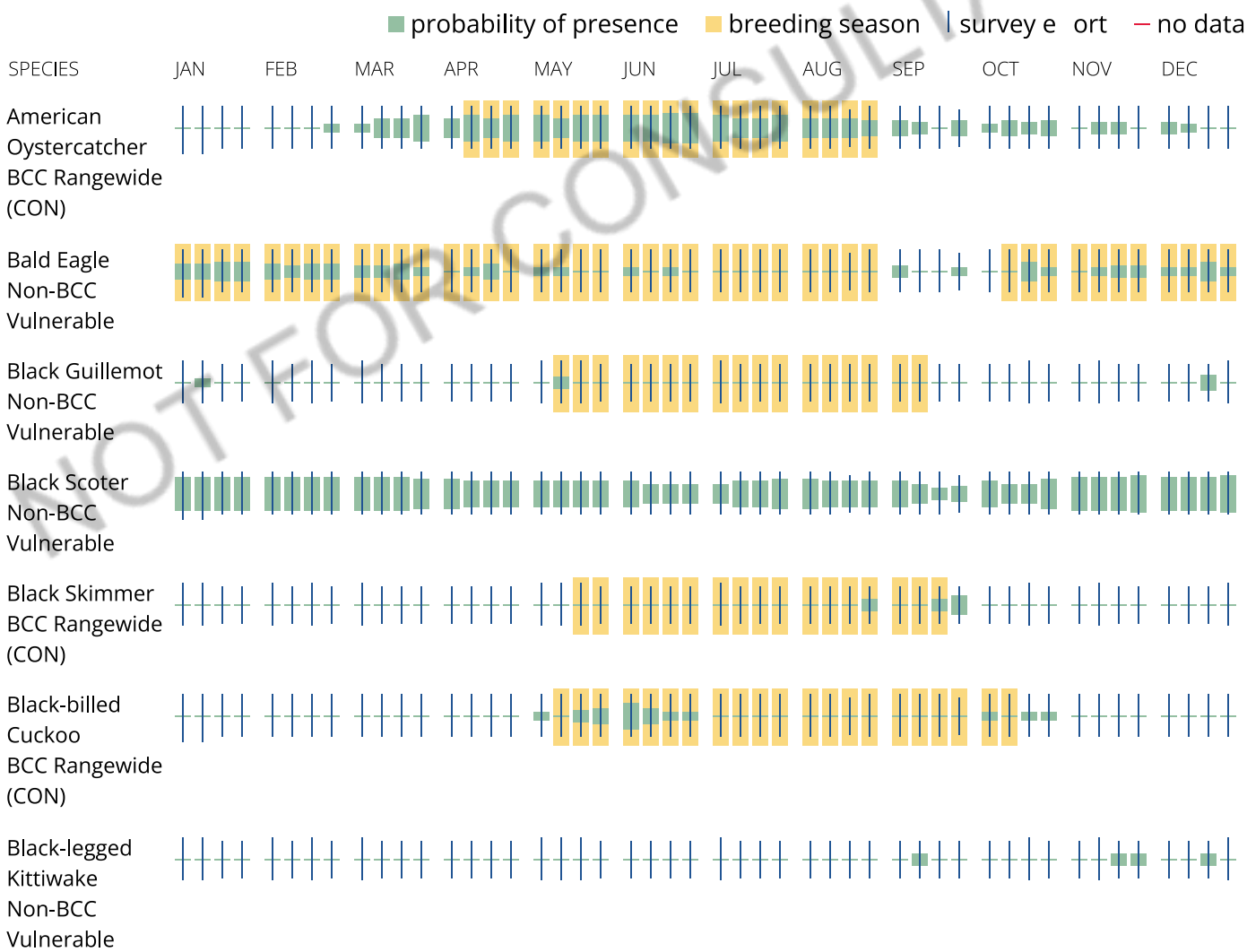
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

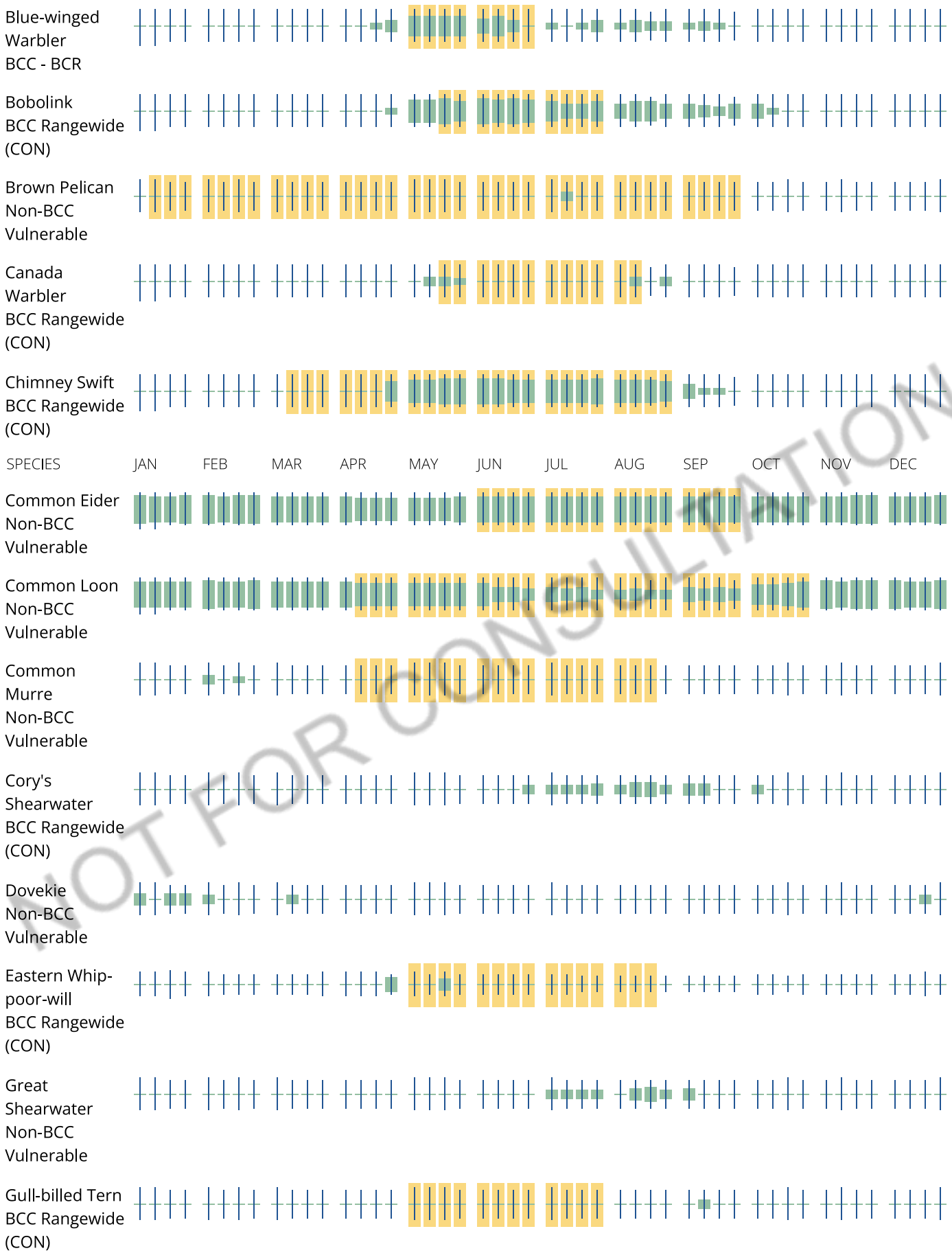
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

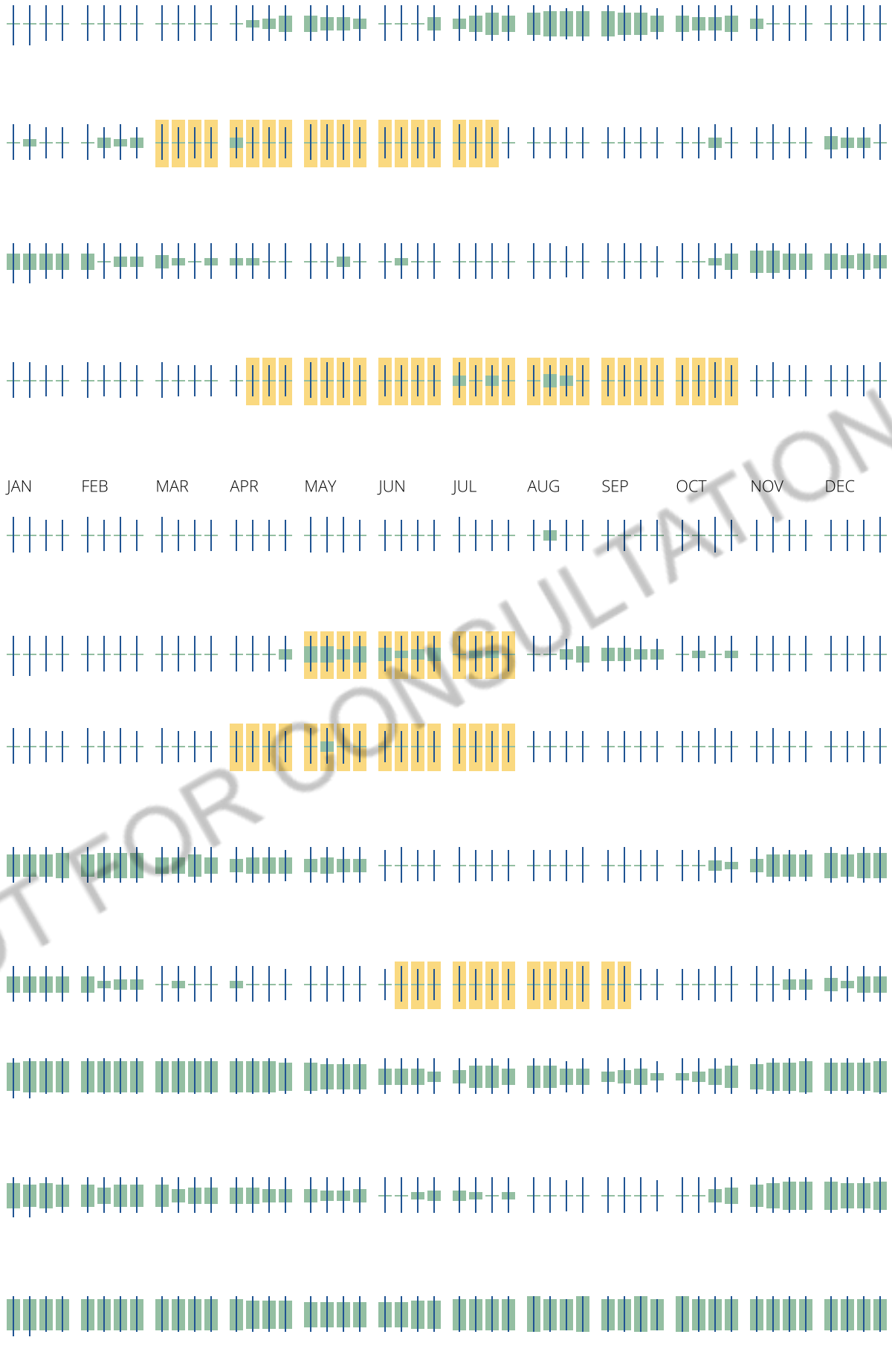
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

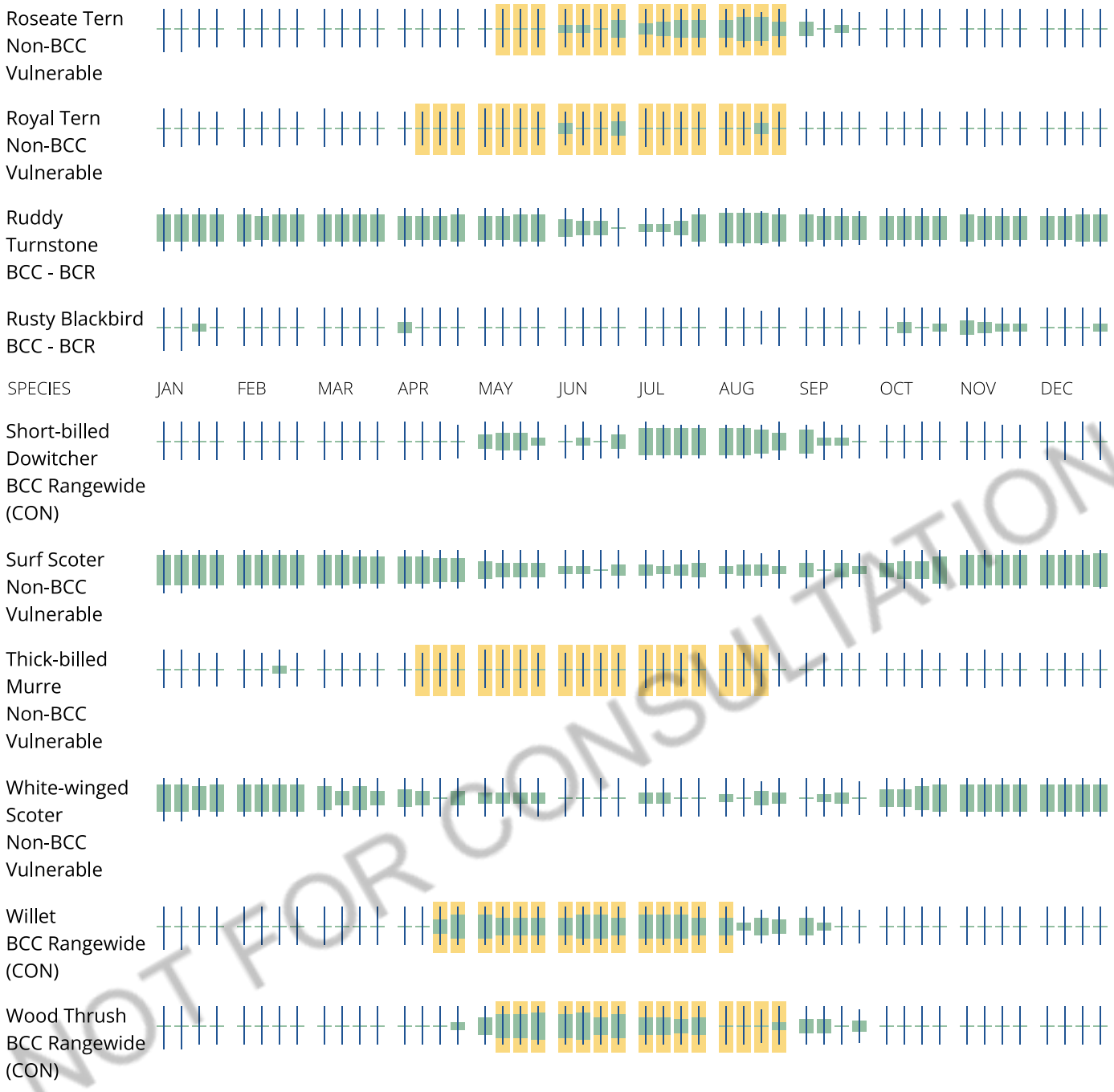
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.









Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
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Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and

minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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What if I have eagles on my list?

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Proper Interpretation and Use of Your Migratory Bird Report

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Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more

information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

This location overlaps the following CBRS unit(s):

Otherwise Protected Area (OPA)

OPAs are denoted with a "P" at the end of the unit number. The only prohibition within OPAs is on federal flood insurance. ***CBRA consultation is not required for projects within OPAs.*** *However, agencies providing disaster assistance that is contingent upon a requirement to purchase flood insurance after the fact are advised to disclose the OPA designation and information on the restrictions on Federal flood insurance to the recipient prior to the commitments of funds.*

RI-04P - FI 11/16/1991
RI-04P - FI 12/18/2014

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
Palustrine

LAKE
Lacustrine

RIVERINE
Riverine

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Massachusetts and Rhode Island

Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

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Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Surf Scoter Melanitta perspicillata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

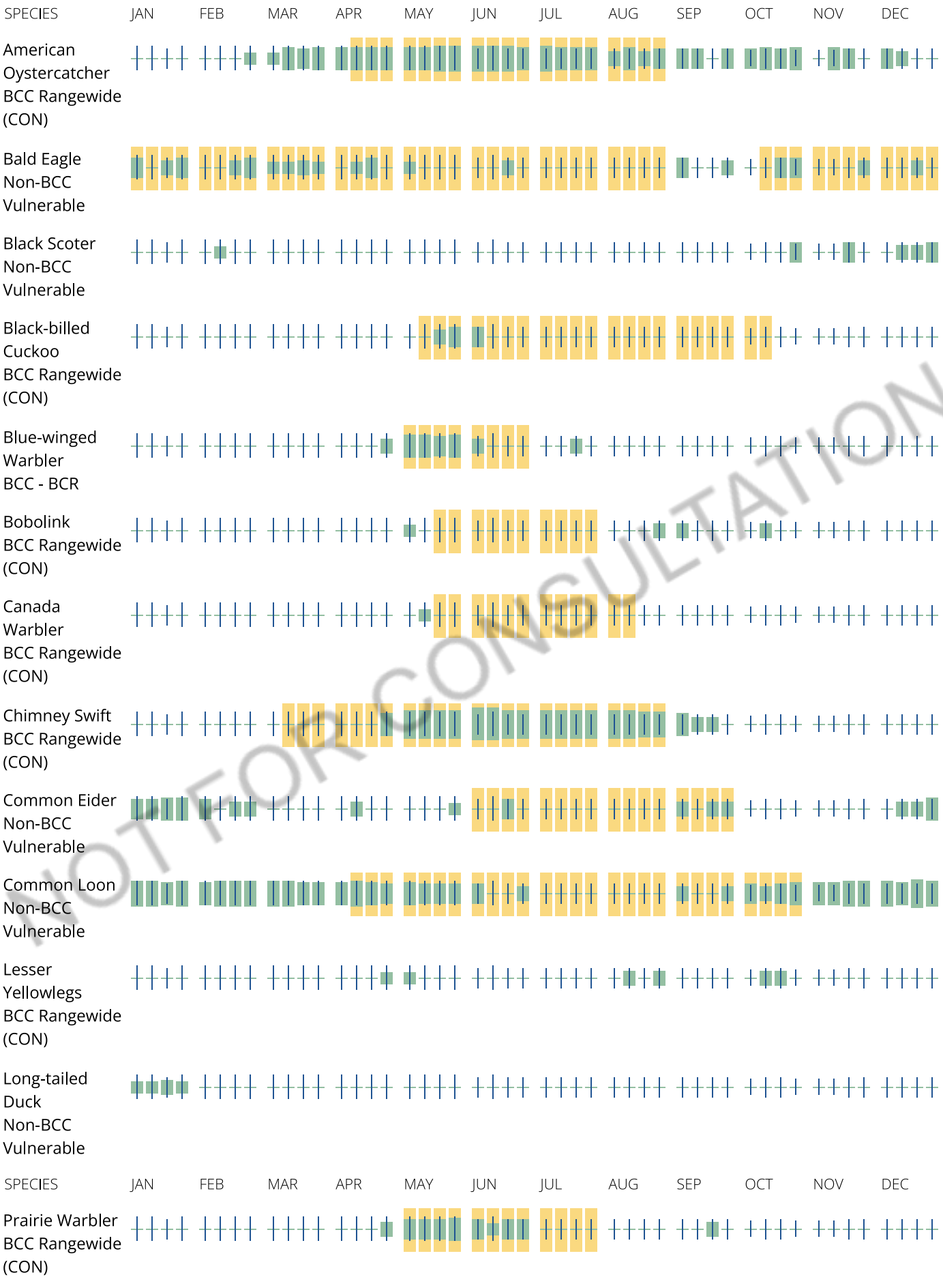
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

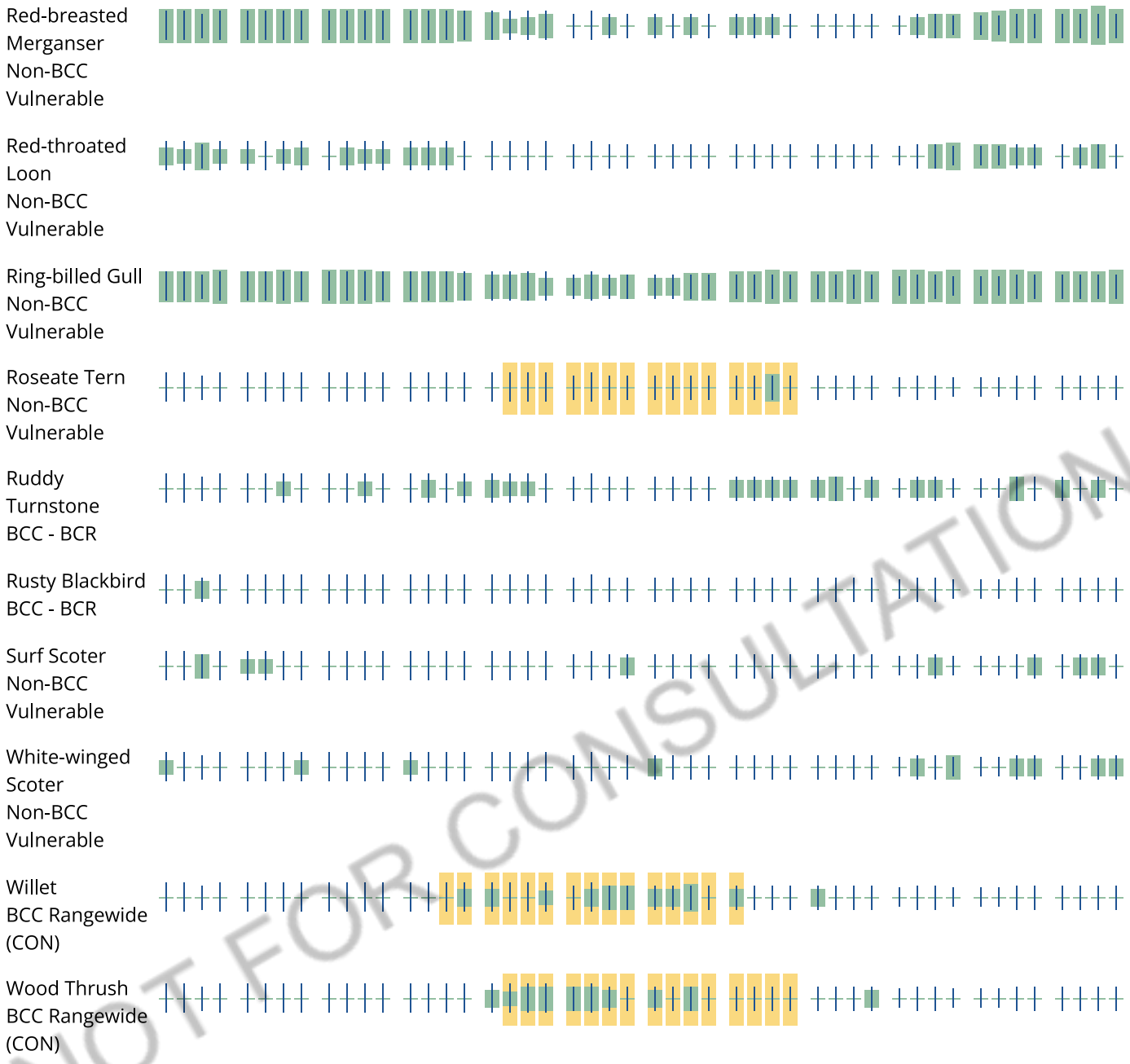
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey e ort – no data





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

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information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

Wildlife refuges and fish hatcheries

Refuge and fish hatchery information is not available at this time

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER

Estuarine

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

IPaC **U.S. Fish & Wildlife Service**

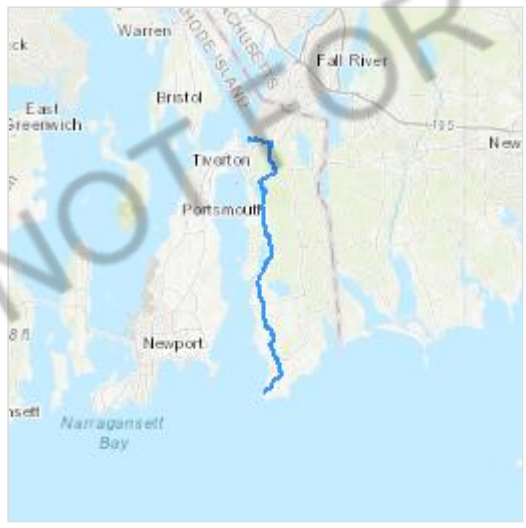
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS o ce(s) with jurisdiction in the de ned project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Newport County, Rhode Island



Local office

New England Ecological Services Field O ce

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential e ects to species, additional site-speci c and project-speci c information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the sheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/ les/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

American Oystercatcher Haematopus palliatus — Breeds Apr 15 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8935

Bald Eagle Haliaeetus leucocephalus — Breeds Oct 15 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Guillemot Cepphus grylle — Breeds May 15 to Sep 10
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Scoter Melanitta nigra — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Brown Pelican Pelecanus occidentalis — Breeds Jan 15 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Eider Somateria mollissima — Breeds Jun 1 to Sep 30
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Murre Uria aalge — Breeds Apr 15 to Aug 15
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Cory's Shearwater Calonectris diomedea — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Dovekie Alle alle — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6041

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Great Shearwater Pu nus gravis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa avipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Long-tailed Duck Clangula hyemalis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/7238

Manx Shearwater Pu nus pu nus — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Pomarine Jaeger Stercorarius pomarinus — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Razorbill Alca torda — Breeds Jun 15 to Sep 10
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-breasted Merganser Mergus serrator — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Red-throated Loon Gavia stellata — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ring-billed Gull Larus delawarensis — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Roseate Tern Sterna dougallii — Breeds May 10 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Royal Tern Thalasseus maximus — Breeds Apr 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Surf Scoter Melanitta perspicillata — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Thick-billed Murre Uria lomvia — Breeds Apr 15 to Aug 15

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

White-winged Scoter Melanitta fusca — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in o shore areas from certain types of development or activities.

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey e ort (see below) can be used to establish a level of con dence in the presence score. One can have higher con dence in the presence score if the corresponding survey e ort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

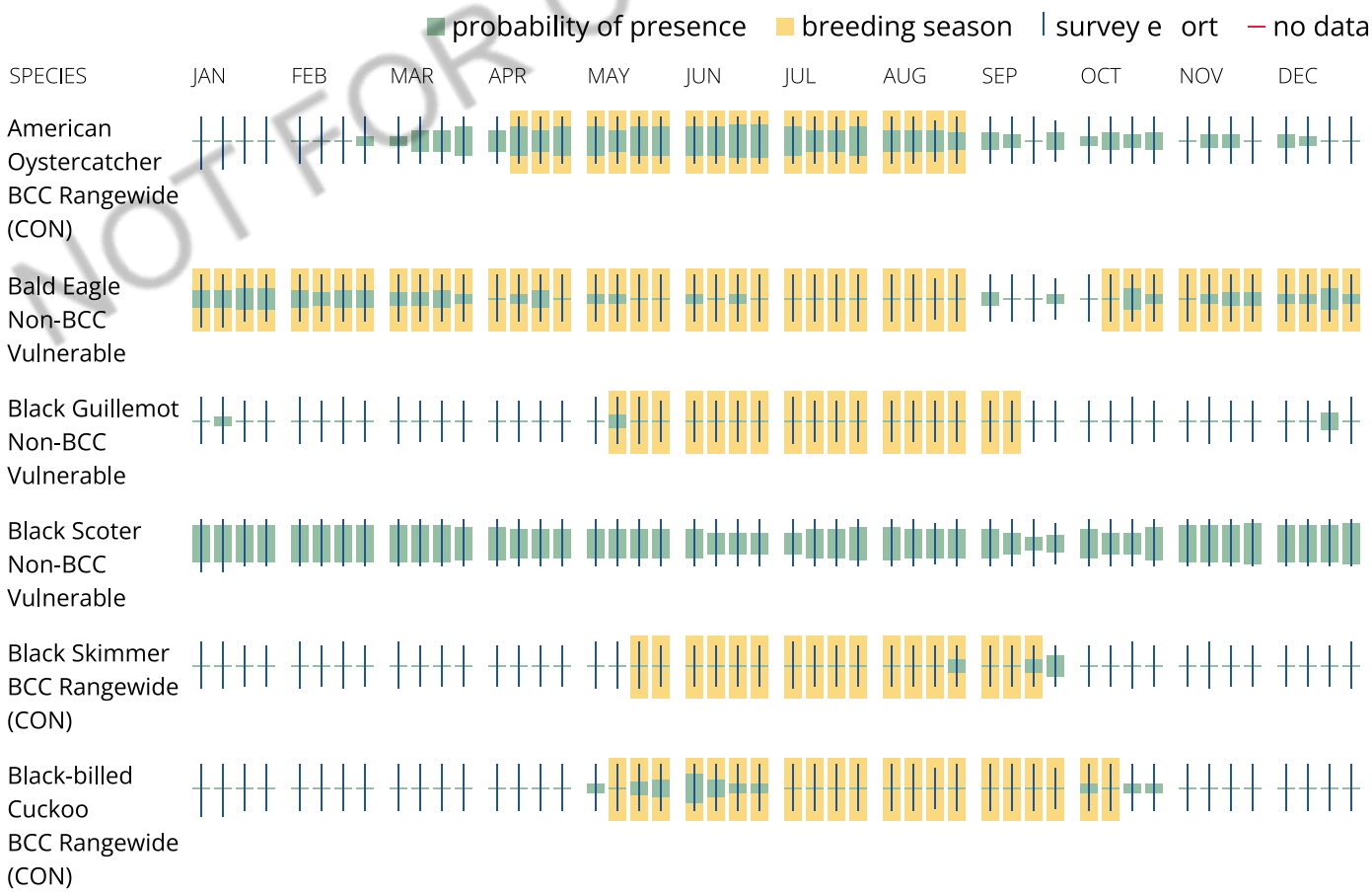
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

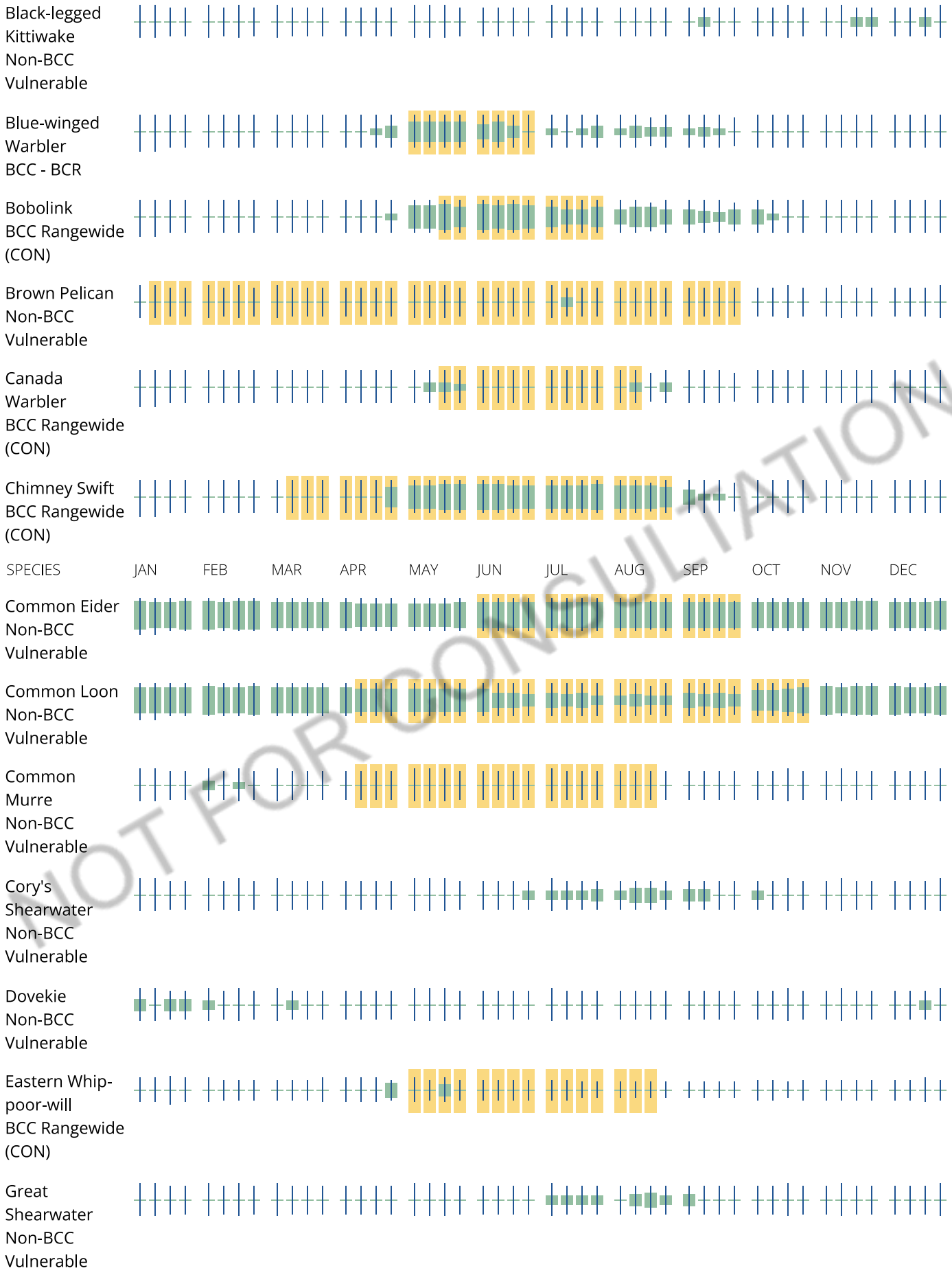
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

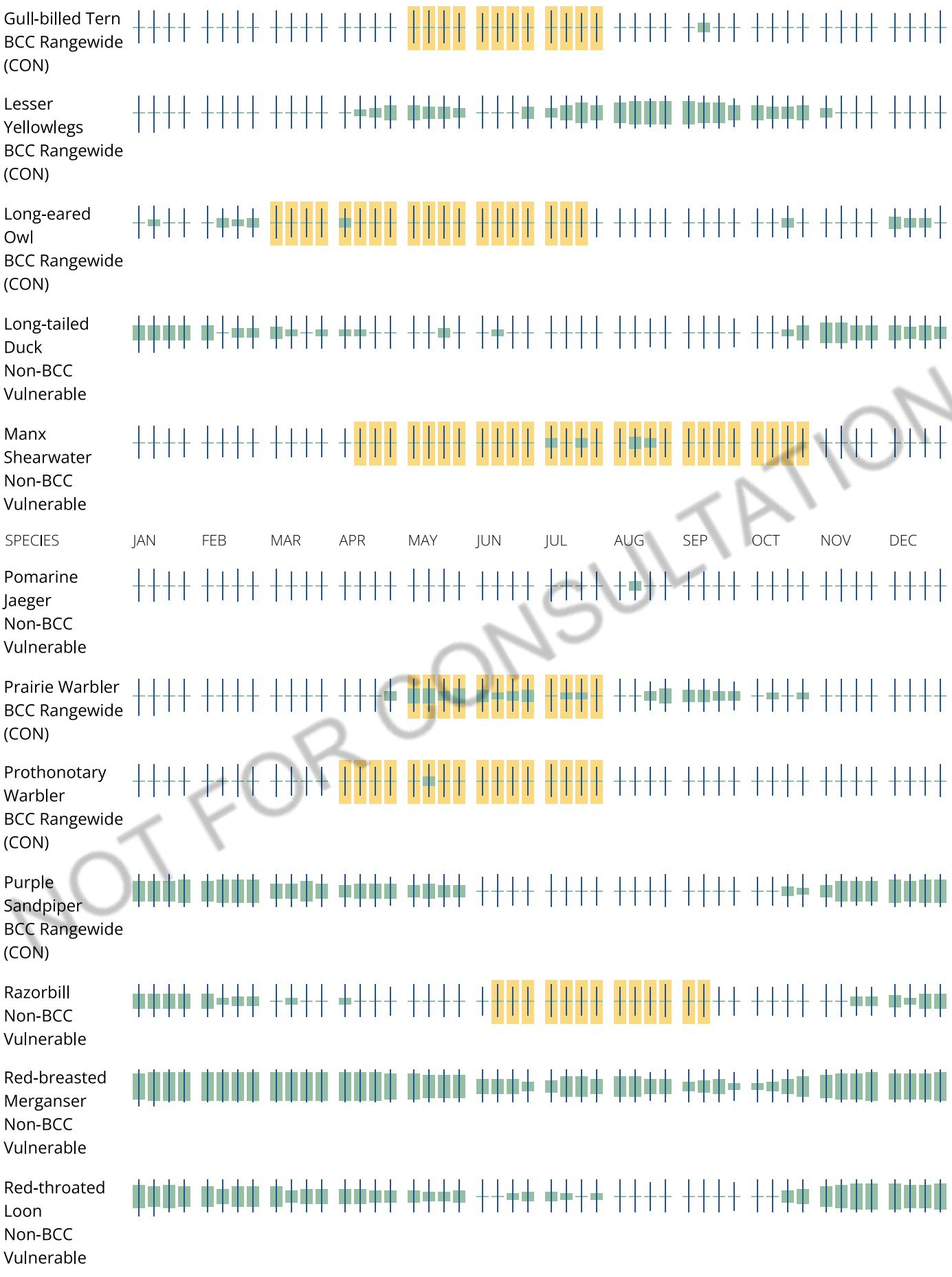
To see a bar's survey e ort range, simply hover your mouse cursor over the bar.

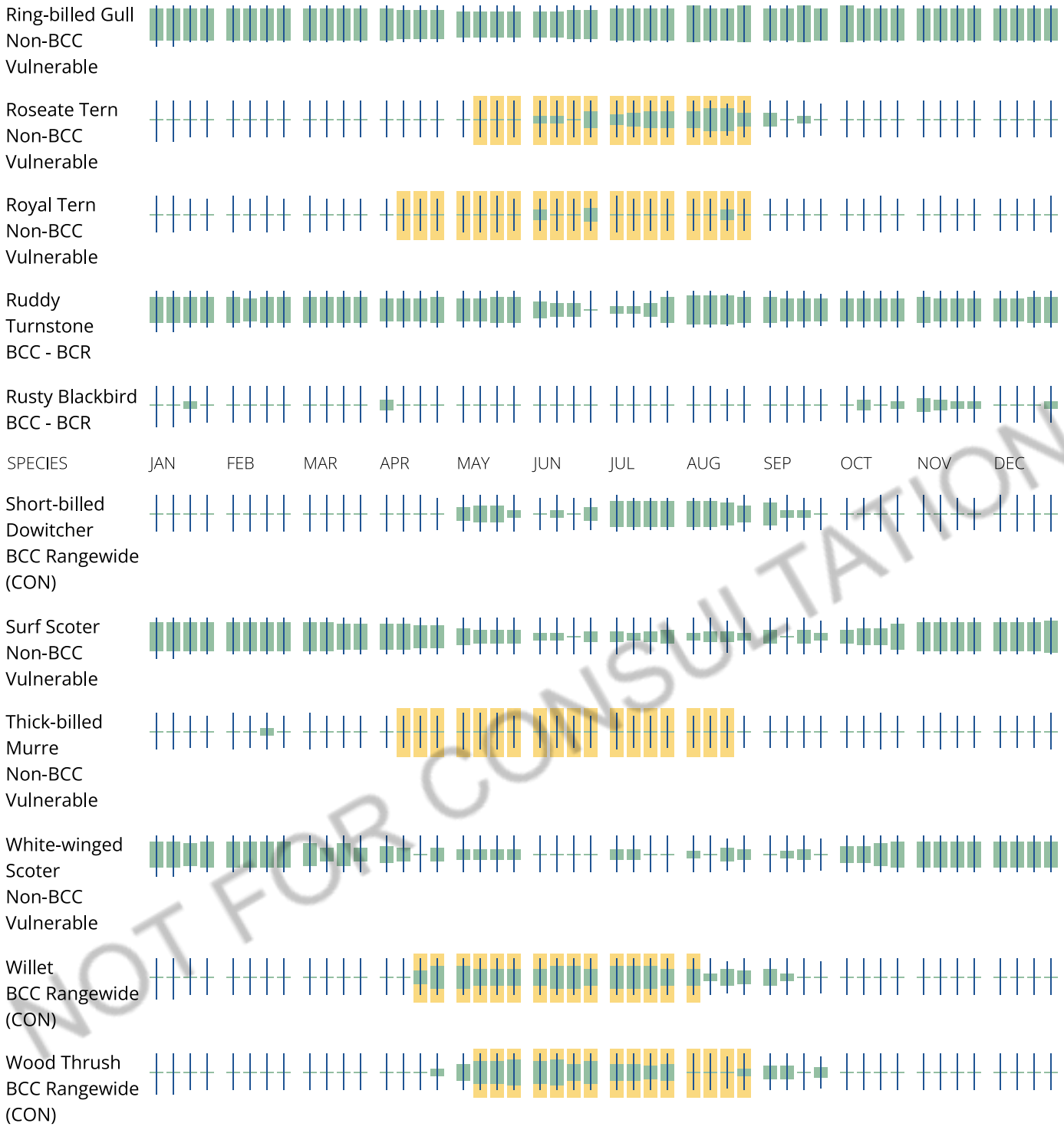
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.









Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my speci ed location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to o shore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my speci ed location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

Although it is important to try to avoid and minimize impacts to all birds, e orts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my speci ed location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey e ort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey e ort is the key component. If the survey e ort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey e ort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to con rm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be con rmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and nancial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field O ce or visit the CBRA Consultations website. The CBRA website provides tools such as a ow chart to help determine whether consultation is required and a template to facilitate the consultation process.

This location overlaps the following CBRS unit(s):

System Unit (SU)

Most new federal expenditures and nancial assistance, including federal ood insurance, are prohibited within System Units. ***Federally-funded projects within System Units require consultation with the Service.*** *Consultation is not required for projects using private, state, or local funds.*

D01 - SU 10/18/1982 - FI 10/1/1983

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the o cial CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Bu er Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an o cial determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the o shore areas of units (e.g., dredging, breakwaters, o shore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identi ed based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classi cation established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth veri cation work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or eld work. There may be occasional di erences in polygon boundaries or classi cations between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuber cid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modi cations within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

Appendix B Collision Model Inputs and Outputs

COLLISION RISK ASSESSMENT
Sheet 1 - Input data

used in overall collision risk sheet
used in migrant collision risk sheet
used in single transit collision risk sheet or extended model
used in available hours sheet
used in large array correction sheet
not used in calculation but stated for reference

	Units	Value	Data sources	Source
Bird data				
Species name		**RedKnot**		
Bird length	m	0.24		Gilbert et al 2022, Table A12
Wingspan	m	0.50		Gilbert et al 2022, Table A12
Flight speed	m/sec	20.1		Gilbert et al 2022, Table A12
Nocturnal activity factor (1-5)		5		Table A-8, Robinson Willmott et al., 2013; Loring et al 2018
Flight type, flapping or gliding		flapping		

Bird survey data			Data sources	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daytime bird density	birds/sq km														
Proportion at rotor height	%														
Proportion of flights upwind	%	34.6%													

Birds on migration data			Data sources	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Migration passages	birds							15		50	50	50				Fall:1500 birds*10% (Gordon and Nations 2016, Loring et al 2018); Spr: 150*10%
Width of migration corridor	km	39														assume all pass through lease
Proportion at rotor height	%	83%														Loring et al 2018, p. 60
Proportion of flights upwind	%	34.6%														Loring et al 2018, Fig. 14

	Units	Value	Data sources
Windfarm data			
Name of windfarm site		**Mayflower**	
Latitude	degrees	40.80	
Number of turbines		147	
Width of windfarm	km	39	
Tidal offset	m	1	

	Units	Value	Data sources	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Turbine data																
Turbine model		**IEA 15MW ref**														Gaertner et al 2020
No of blades		3														
Rotation speed	rpm	7.56														rated rpm, Gaertner et al 2020
Rotor radius	m	110														BA Fig. 5
Hub height	m	127														BA Fig. 5
Monthly proportion of time operational	%			94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	Whitney Marsh email 8/8/22 (placeholder)
Max blade width	m	5.770														Gaertner et al 2020
Pitch	degrees	1														

Avoidance rates used in presenting results			Data sources (if applicable)
	95.01%	X	Cook 2021, Table A2 “All Gulls and Terns” Extended Band (2012) model
	98.00%		
	99.00%		
	99.50%		

COLLISION RISK ASSESSMENT (BIRDS ON MIGRATION)

Sheet 2 - Overall collision risk

All data input on Sheet 1:
no data entry needed on this sheet!
other than to choose option for final tables

from Sheet 1 - input data
from Sheet 6 - available hours
from Sheet 3 - single transit collision risk
from survey data
calculated field

Bird details:

Species		RedKnot
Flight speed	m/sec	20.1
Flight type		flapping

Windfarm data:

Number of turbines		147
Rotor radius	m	110
Minimum height of rotor	m	127
Total rotor frontal area	sq m	5587951

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year average
Proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	90.3%
Stage A - flight activity															**per annum**
Migration passages			0	0	0	0	15	0	50	50	50	0	0	0	**165**
Migrant flux density	birds/ km		0	0	0	0	0.38462	0	1.28205	1.28205	1.28205	0	0	0	
Proportion at rotor height	%	83%													
Flux factor			0	0	0	0	10	0	33	33	33	0	0	0	
Option 1 -Basic model - Stages B, C and D															
Potential bird transits through rotors			0	0	0	0	8	0	27	27	27	0	0	0	**89**
Collision risk for single rotor transit	(from sheet 3)	3.7%													
Collisions for entire windfarm, allowing for non-op time, assuming no avoidance	birds per month or year		**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**3**
Option 2-Basic model using proportion from flight distribution			**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**2**
Option 3-Extended model using flight height distribution															
Proportion at rotor height	(from sheet 4)	49.3%													
Potential bird transits through rotors	Flux integral	0.5103	0	0	0	0	5	0	17	17	17	0	0	0	**55**
Collisions assuming no avoidance	Collision integral	0.01381	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Average collision risk for single rotor transit		2.7%													
Stage E - applying avoidance rates															
Using which of above options?	**Option 3**	0.00%	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Collisions assuming avoidance rate	birds per month or year	95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Collisions after applying large array correction		95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**

COLLISION RISK ASSESSMENT
Sheet 1 - Input data

used in overall collision risk sheet
used in migrant collision risk sheet
used in single transit collision risk sheet or extended model
used in available hours sheet
used in large array correction sheet
not used in calculation but stated for reference

	Units	Value	Data sources	Source
Bird data				
Species name		**RedKnot**		
Bird length	m	0.24		Gilbert et al 2022, Table A12
Wingspan	m	0.50		Gilbert et al 2022, Table A12
Flight speed	m/sec	20.1		Gilbert et al 2022, Table A12
Nocturnal activity factor (1-5)		5		Table A-8, Robinson Willmott et al., 2013; Loring et al 2018
Flight type, flapping or gliding		flapping		

Bird survey data			Data sources	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daytime bird density	birds/sq km														
Proportion at rotor height	%														
Proportion of flights upwind	%	34.6%													

Birds on migration data			Data sources	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Source
Migration passages	birds							15		50	50	50				Fall:1500 birds*10% (Gordon and Nations 2016, Loring et al 2018); Spr: 150*10%
Width of migration corridor	km	39														assume all pass through lease
Proportion at rotor height	%	83%														Loring et al 2018, p. 60
Proportion of flights upwind	%	34.6%														Loring et al 2018, Fig. 14

	Units	Value	Data sources
Windfarm data			
Name of windfarm site		**Mayflower**	
Latitude	degrees	40.80	
Number of turbines		147	
Width of windfarm	km	39	
Tidal offset	m	1	

	Units	Value	Data sources	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Source
Turbine data																
Turbine model		**>15MW**														
No of blades		3														
Rotation speed	rpm	7.56														rated rpm for 15MW reference turbine, Gaertner et al 2020
Rotor radius	m	140														BA Fig. 5
Hub height	m	184														BA Fig. 5
Monthly proportion of time operational	%			94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	Whitney Marsh email 8/8/22 (placeholder)
Max blade width	m	5.770														15MW blade, Gaertner et al 2020
Pitch	degrees	1														

Avoidance rates used in presenting results			Data sources (if applicable)
	95.01%	X	Cook 2021, Table A2 “All Gulls and Terns” Extended Band (2012) model
	98.00%		
	99.00%		
	99.50%		

COLLISION RISK ASSESSMENT (BIRDS ON MIGRATION)

Sheet 2 - Overall collision risk

All data input on Sheet 1:
no data entry needed on this sheet!
other than to choose option for final tables

from Sheet 1 - input data
from Sheet 6 - available hours
from Sheet 3 - single transit collision risk
from survey data
calculated field

Bird details:

Species		RedKnot
Flight speed	m/sec	20.1
Flight type		flapping

Windfarm data:

Number of turbines		147
Rotor radius	m	140
Minimum height of rotor	m	184
Total rotor frontal area	sq m	9051557

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year average
Proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	90.3%
Stage A - flight activity															**per annum**
Migration passages			0	0	0	0	15	0	50	50	50	0	0	0	**165**
Migrant flux density	birds/ km		0	0	0	0	0.38462	0	1.28205	1.28205	1.28205	0	0	0	
Proportion at rotor height	%	83%													
Flux factor			0	0	0	0	12	0	41	41	41	0	0	0	
Option 1 -Basic model - Stages B, C and D															
Potential bird transits through rotors			0	0	0	0	10	0	34	34	34	0	0	0	**114**
Collision risk for single rotor transit	(from sheet 3)	3.0%													
Collisions for entire windfarm, allowing for non-op time, assuming no avoidance	birds per month or year		**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**3**
Option 2-Basic model using proportion from flight distribution			**0**	**0**	**0**	**0**	**1**	**0**	**2**	**2**	**2**	**0**	**0**	**0**	**8**
Option 3-Extended model using flight height distribution															
Proportion at rotor height	(from sheet 4)	221.6%													
Potential bird transits through rotors	Flux integral	0.9380	0	0	0	0	12	0	39	39	39	0	0	0	**128**
Collisions assuming no avoidance	Collision integral	0.01352	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Average collision risk for single rotor transit		1.4%													
Stage E - applying avoidance rates															
Using which of above options?	**Option 3**	0.00%	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Collisions assuming avoidance rate	birds per month or year	95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Collisions after applying large array correction		95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**

Summary of simulation results from SCRAM: a stochastic collision risk assessment for movement data

07 October 2022

SCRAM was developed by Biodiversity Research Institute, the University of Rhode Island, and the U.S. Fish and Wildlife Service with funding from the Bureau of Ocean Energy Management.

SCRAM run details

```
## SCRAM - the Stochastic Collision Risk Assessment for Movement version 0.91 - Brachycarpus
## was run for 1000 iterations using Option 3: slower but more accurate assessment
## Project: Mayflower
## Modeler: David Bigger
## The model run was started at: Fri Oct 07 12:48:43 2022 EDT
## The model run was completed at: Fri Oct 07 13:54:28 2022 EDT
## Run 1: the probability of exceeding specified threshold (1) is < 0.001.
## Run 2: the probability of exceeding specified threshold (1) is < 0.001.
```

Model inputs used for this analysis

Table 1: Species input parameters (mean and 95 perc. range).

Species	Turbine model	Avoidance	Wing span	Body length	Speed
Red Knot	15	0.93 (0.92, 0.94)	0.49 (0.45, 0.54)	0.24 (0.23, 0.25)	20.06 (16.29, 23.89)
Red Knot	20	0.93 (0.92, 0.94)	0.49 (0.45, 0.54)	0.24 (0.23, 0.25)	20.06 (16.29, 23.89)

Table 2: Species monthly (Jan-Jun) population estimates ± SD and assumptions/limitations as specified by the USFWS using the most recent data.

Species	Jan	Feb	Mar	Apr	May	Jun
Red Knot	10400 ± 0	10400 ± 0	10400 ± 0	10400 ± 0	59200 ± 0	59200 ± 0

Table 3: Species monthly (Jul-Dec) population estimates ± SD and assumptions/limitations as specified by the USFWS using the most recent data.

Species	Jul	Aug	Sep	Oct	Nov	Dec
Red Knot	59200 ± 0	59200 ± 0	72520 ± 0	54720 ± 0	41400 ± 0	10400 ± 0

Population data assumptions/limitations:
1) All pass through in spring - #s consistent w/Lyons et al super-population estimate for 2020 in DE Bay: 40,444 (95 perc. credible interval: 33,627–49,966).
2) Winter population estimates represent the total # of adults and sub-adults (in general).
3) Southern and northern wintering birds could be present during July - Sept.
4) Only northern wintering birds could be present during Oct - Nov.
5) Only southeast US and Caribbean birds could be present during Dec.
6) Birds from western Gulf population are excluded from totals in Atlantic region due to lack of information on extent to which they use the Atlantic region.
7) Numbers do not include HY birds in fall.
8) Dec number coming from Lyons et al 2017. Just includes SE US Birds, not Caribbean.
9) Issues with double counting addressed because birds may be present in different areas of Atlantic region for weeks to months.

Table 4: Wind farm input parameters (mean and 95 perc. range).

Species	Turbine model	Num. turbines	Rotor radius	Hub height (m)	Blade width (m)	Wind speed (mps)
Red Knot	15	147 (147, 147)	110 (110, 110)	126 (126, 126)	5.77 (5.77, 5.77)	10.09 (5.55, 14.51)
Red Knot	20	147 (147, 147)	140 (140, 140)	184 (184, 184)	5.77 (5.77, 5.77)	10.15 (5.56, 14.56)

Table 5: Wind farm input parameters (mean and 95 perc. range).

Species	Turbine model	Prop. upwind	Rotor speed (rpm)	Pitch (radians)	Farm width (km)	Lat.	Long.
Red Knot	15	1 (1, 1)	4.82 (2.65, 6.93)	0.03 (0.03, 0.04)	39 (39, 39)	40.82	-70.31
Red Knot	20	1 (1, 1)	3.81 (2.09, 5.46)	0.03 (0.03, 0.04)	39 (39, 39)	40.82	-70.31

Table 6: Monthly wind farm operational data (mean and 95 perc. range) is given for each wind farm specification.

Species	Turbine model	Jan Op.	Feb Op.	Mar Op.	Apr Op.	May Op.	Jun Op.
Red Knot	15	88 (84.1, 92.1)	87.6 (83.8, 91.6)	85.8 (82.4, 89.4)	85.1 (81.6, 88.5)	82.9 (79.3, 86.5)	83.4 (79.9, 87)
Red Knot	20	87.9 (84.4, 91.5)	87.6 (83.9, 91.3)	85.9 (82.4, 89.5)	85.1 (81.5, 88.7)	82.9 (79.3, 86.5)	83.3 (79.6, 86.8)

Table 7: Monthly wind farm operational data (mean and 95 perc. range) is given for each wind farm specification.

Species	Turbine model	Jul Op.	Aug Op.	Sep Op.	Oct Op.	Nov Op.	Dec Op.
Red Knot	15	80.8 (77.4, 84)	79.7 (76.4, 83.1)	81.3 (77.6, 84.5)	85.1 (81.6, 88.9)	87.5 (83.6, 91.1)	87.7 (84, 91.4)
Red Knot	20	81 (77.5, 84.1)	79.8 (76.4, 83)	81.4 (78.1, 85)	85.1 (81.5, 88.6)	87.4 (83.5, 91)	87.8 (84.3, 91.4)

Results for the SCRAM simulation

Table 8: The predicted mean and 95 perc. prediction intervals of the number of collisions per month and the total summed monthly number of collisions and 95 perc. prediction interval. Results are not shown for months that do not have movement data.

Species	Turbine model	month	Mean number of collisions	Lower pred. interval	Upper pred. interval
Red Knot	15	Jan			
Red Knot	15	Feb			
Red Knot	15	Mar			
Red Knot	15	Apr			
Red Knot	15	May			
Red Knot	15	Jun			
Red Knot	15	Jul			
Red Knot	15	Aug	0.002	0	0.008
Red Knot	15	Sep	0.002	0	0.017
Red Knot	15	Oct	0.001	0	0.011
Red Knot	15	Nov	0.001	0	0.011
Red Knot	15	Dec			
Red Knot	15	annual	0.006	0.004	0.02
Red Knot	20	Jan			
Red Knot	20	Feb			
Red Knot	20	Mar			
Red Knot	20	Apr			
Red Knot	20	May			
Red Knot	20	Jun			
Red Knot	20	Jul			
Red Knot	20	Aug	0.002	0	0.01
Red Knot	20	Sep	0.003	0	0.02
Red Knot	20	Oct	0.001	0	0.013
Red Knot	20	Nov	0.001	0	0.013
Red Knot	20	Dec			
Red Knot	20	annual	0.007	0.004	0.024

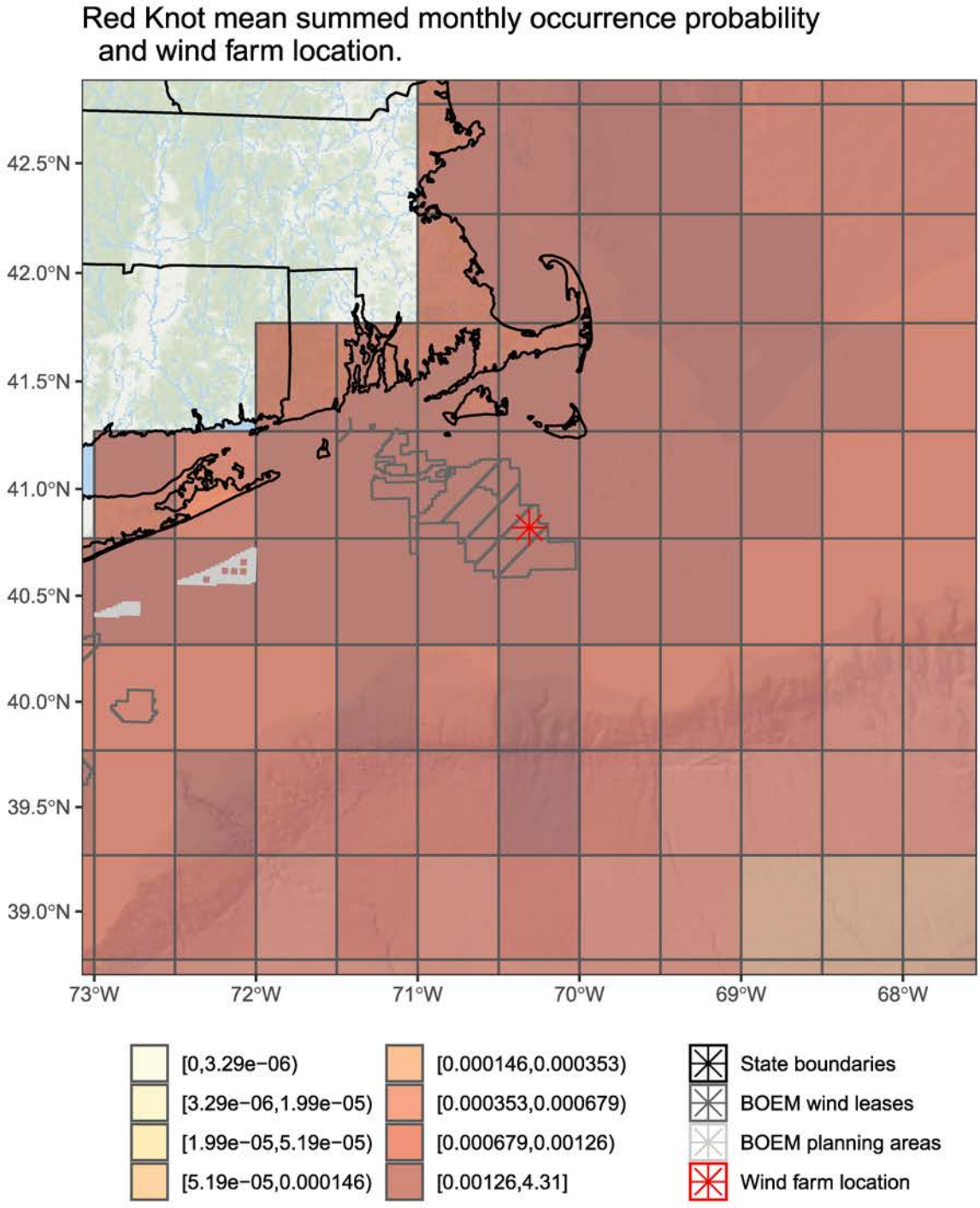


Figure 1: A map of the species occurrence probabities and wind farm location.

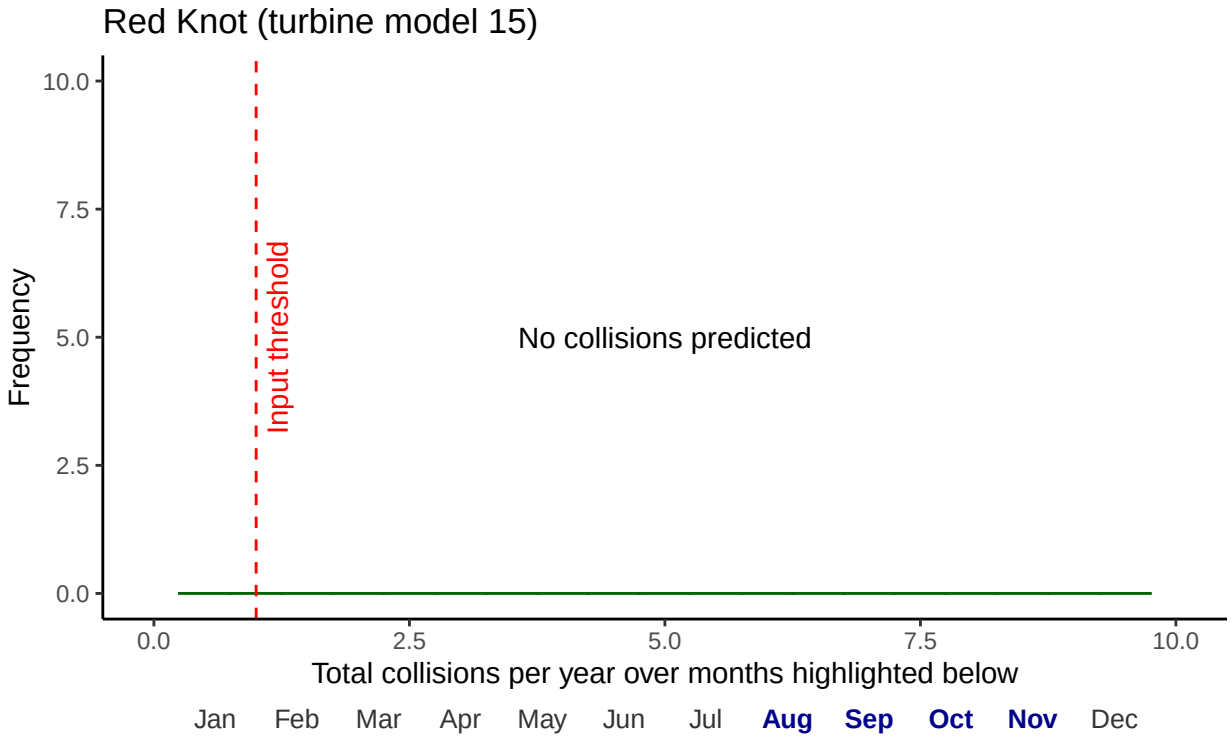


Figure 2: A frequency histogram of the total number of collisions per year. The heights of the bars show the relative frequency of each value. Months for which movement data were provided or available are shown in bold; only bold months are shown in histogram of annual collisions.

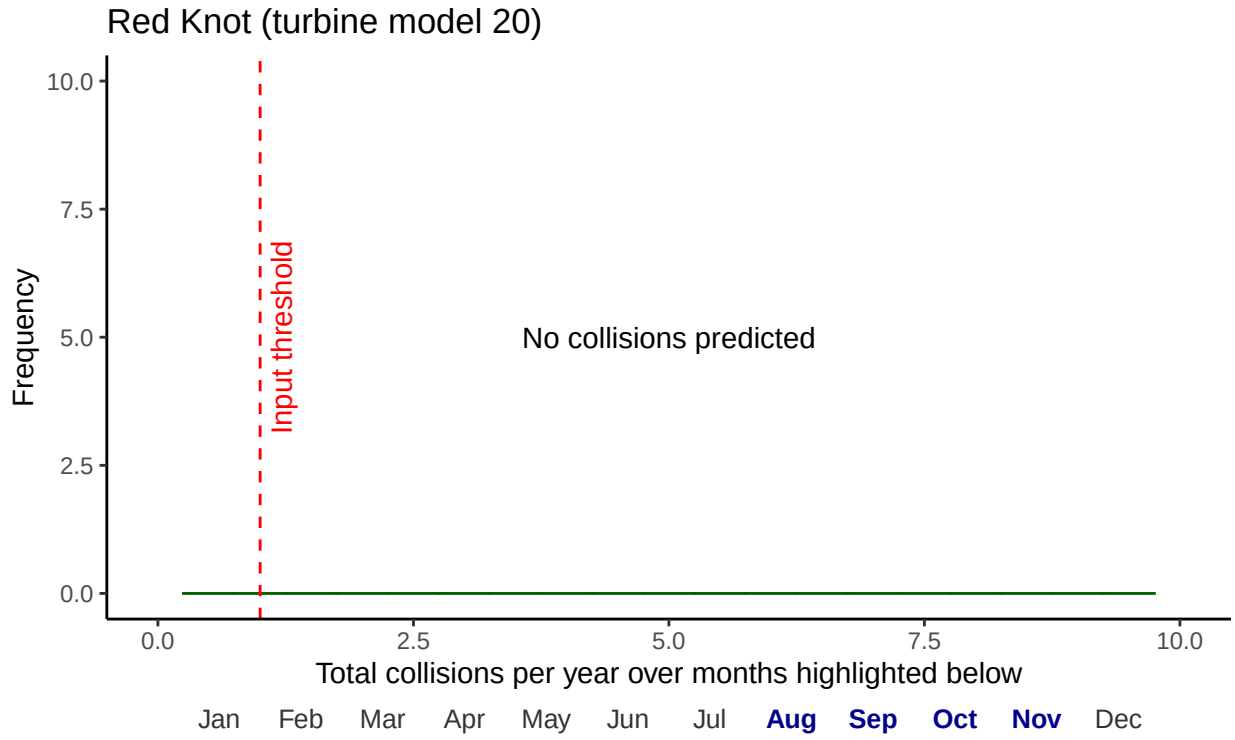
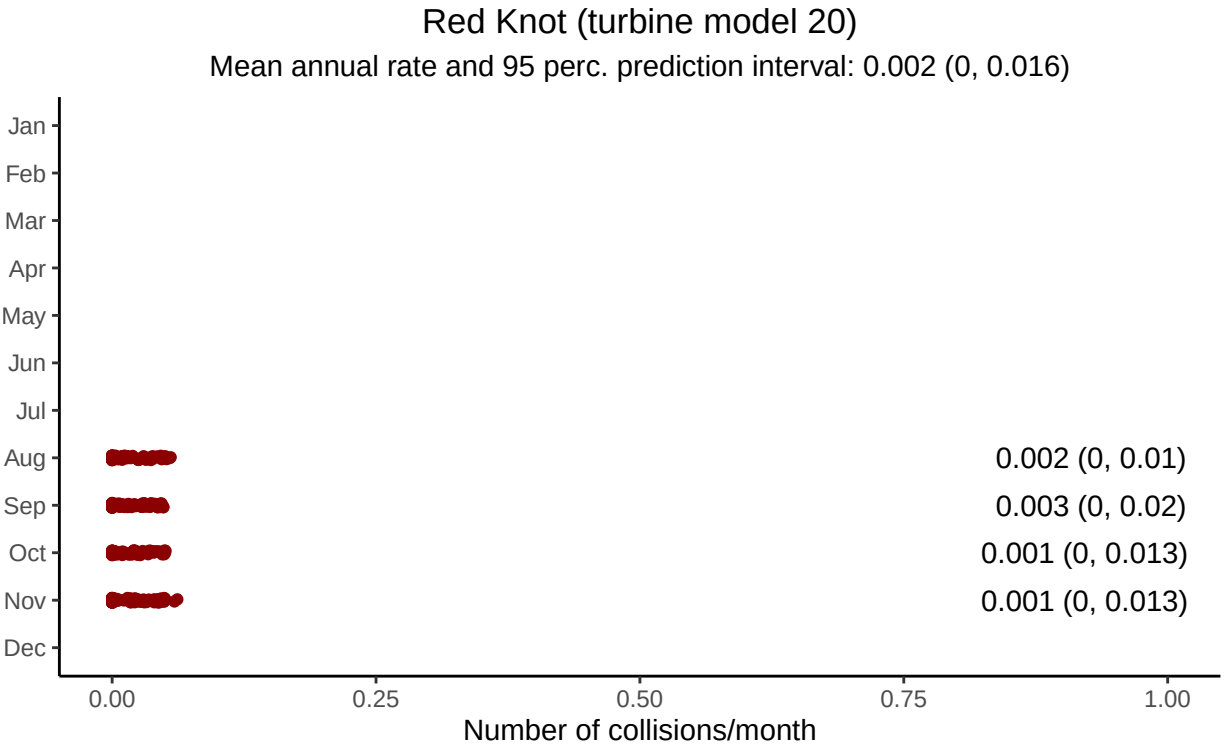


Figure 3: A frequency histogram of the total number of collisions per year. The heights of the bars show the relative frequency of each value. Months for which movement data were provided or available are shown in bold; only bold months are shown in histogram of annual collisions.



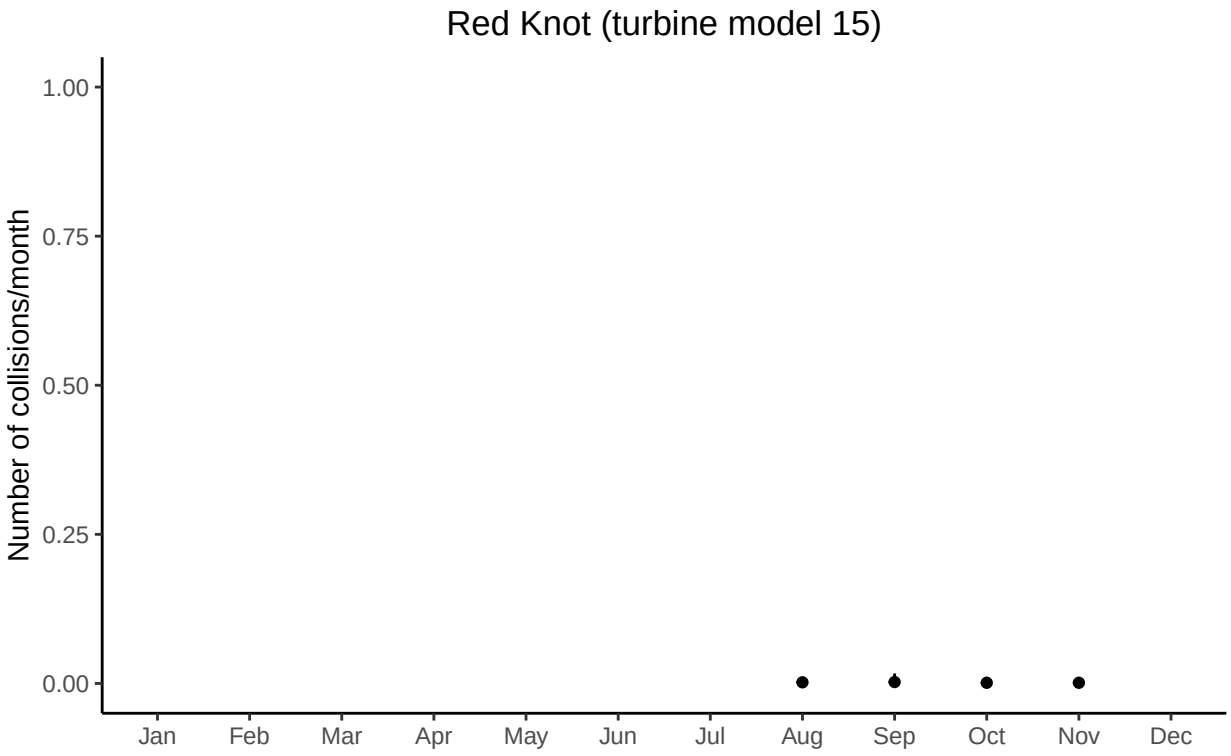


Figure 4: The predicted mean and 95 perc. prediction intervals of the number of collisions per month. Results are not shown for months that do not have movement data.

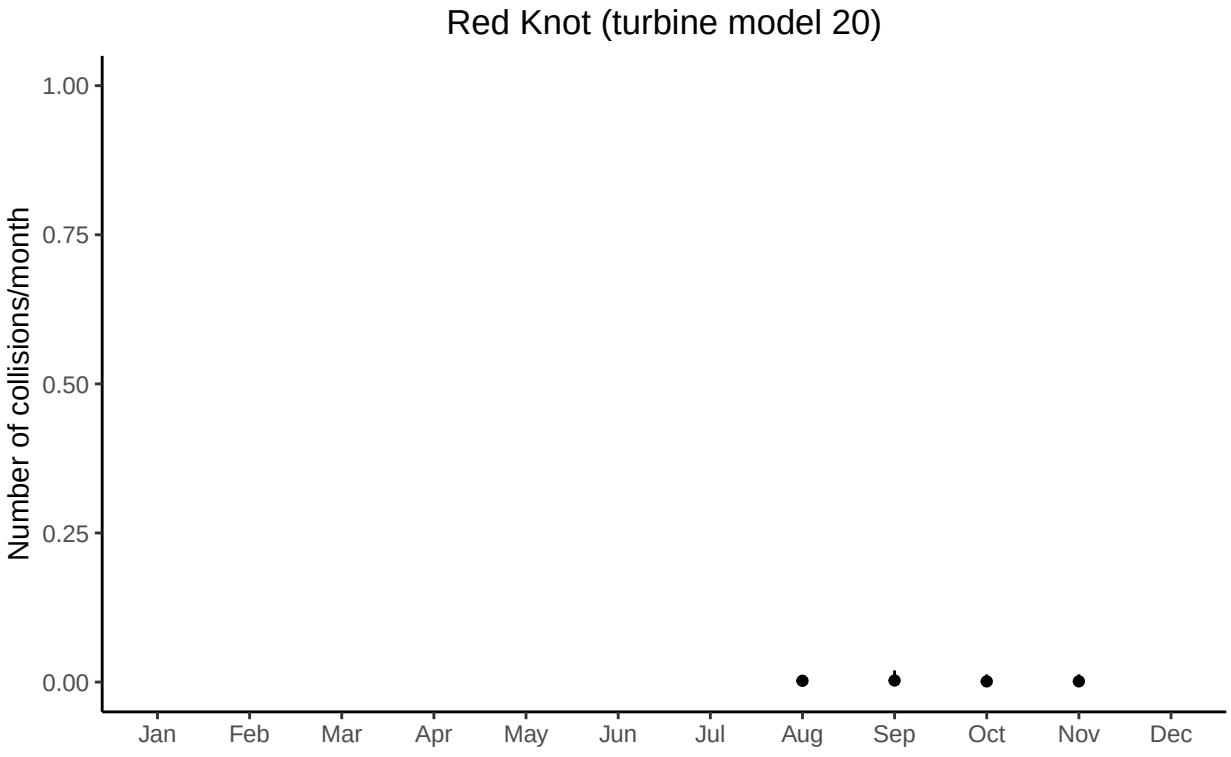


Figure 5: The predicted mean and 95 perc. prediction intervals of the number of collisions per month. Results are not shown for months that do not have movement data.

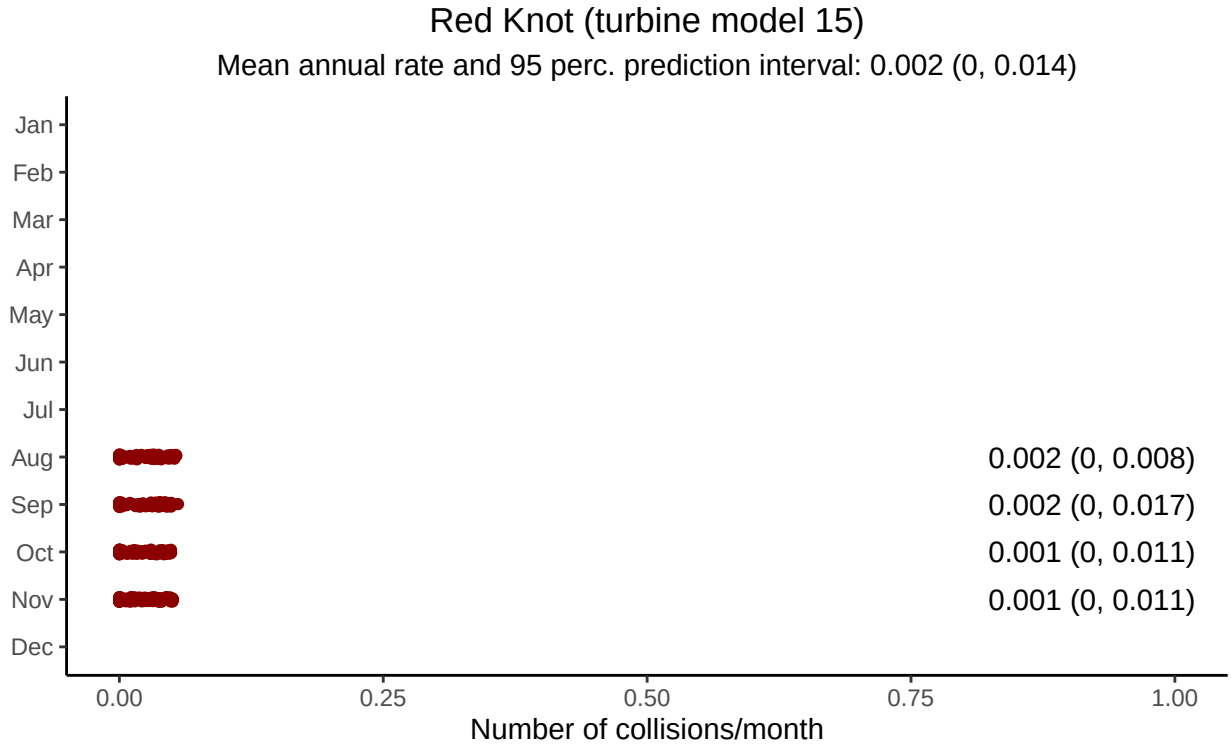


Figure 6: The mean number of collisions per month for each turbine model combination. A sample of 100 runs of the of simulation are plotted showing the typical variation among iterations. The iterations among this set that exceed the user-specified threshold for the number of collisions, if set, are shown in red; iterations below this threshold are shown in blue. Since the threshold is a yearly value, the threshold here is that value divided by 12. The annual and monthly mean (95 perc. prediction interval) for al iterations are shown at top (annual) and for each month to the right of the plot.

COLLISION RISK ASSESSMENT
Sheet 1 - Input data

used in overall collision risk sheet
used in migrant collision risk sheet
used in single transit collision risk sheet or extended model
used in available hours sheet
used in large array correction sheet
not used in calculation but stated for reference

	Units	Value	Data sources	Source
Bird data				
Species name		**Roseate tern**		
Bird length	m	0.37		Gilbert et al 2022, Table A12
Wingspan	m	0.76		Gilbert et al 2022, Table A12
Flight speed	m/sec	12.8		Gilbert et al 2022, Table A12
Nocturnal activity factor (1-5)		1		Table A-8, Robinson Willmott et al., 2013 value = 1 (PL data confirms)
Flight type, flapping or gliding		flapping		

Bird survey data			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Data sources	Source
Daytime bird density	birds/sq km					0.04	0.02									HiRes Aerial Surveys Table 12, b Lease area
Proportion at rotor height	%	6.0%														
Proportion of flights upwind	%	37.5%														

Birds on migration data															Data sources	Source
Migration passages	birds					4331	4331	817	817	8657	8657					Adult, fledglings, non-breeding, numbers devived from Mostello unpub data & Nisbet et al 2014
Width of migration corridor	km	135														Migration front is Block Island to Monomoy
Proportion at rotor height	%	6%														Loring et al 2019, Table 18 Fed waters
Proportion of flights upwind	%	37.5%														Loring et al 2019, Fig 50

	Units	Value	Data sources	Source
Windfarm data				
Name of windfarm site		**Mayflower**		
Latitude	degrees	40.80		
Number of turbines		147		COP
Width of windfarm	km	39		Measured from BA Fig. 1
Tidal offset	m	1		

	Units	Value	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Data sources	Source
Turbine data																
Turbine model		**IEA 15MW ref**														Gaertner et al 2020
No of blades		3														
Rotation speed	rpm	7.56														rated rpm, Gaertner et al 2020
Rotor radius	m	110														BA Fig. 5
Hub height	m	127														BA Fig. 5
Monthly proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%		Whitney Marsh email 8/8/22 (placeholder)
Max blade width	m	5.770														Gaertner et al 2020
Pitch	degrees	1														

Avoidance rates used in presenting results			Data sources (if applicable)
	95.01%	X	Cook 2021, Table A2 “All Gulls and Terns” Extended Band (2012) model
	98.00%		
	99.00%		
	99.50%		

COLLISION RISK ASSESSMENT (BIRDS ON MIGRATION)

Sheet 2 - Overall collision risk

All data input on Sheet 1:
no data entry needed on this sheet!
other than to choose option for final tables

from Sheet 1 - input data
from Sheet 6 - available hours
from Sheet 3 - single transit collision risk
from survey data
calculated field

Bird details:

Species		Roseate tern
Flight speed	m/sec	12.8
Flight type		flapping

Windfarm data:

Number of turbines		147
Rotor radius	m	110
Minimum height of rotor	m	127
Total rotor frontal area	sq m	5587951

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year average
Proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	90.3%
Stage A - flight activity															**per annum**
Migration passages			0	0	0	4331	4331	817	817	8657	8657	0	0	0	**27610**
Migrant flux density	birds/ km		0	0	0	32.081	32.0815	6.05185	6.05185	64.1259	64.1259	0	0	0	
Proportion at rotor height	%	6%													
Flux factor			0	0	0	815	815	154	154	1629	1629	0	0	0	
Option 1 -Basic model - Stages B, C and D															
Potential bird transits through rotors			0	0	0	52	52	10	10	104	104	0	0	0	**332**
Collision risk for single rotor transit	(from sheet 3)	4.4%													
Collisions for entire windfarm, allowing for non-op time, assuming no avoidance	birds per month or year		**0**	**0**	**0**	**2**	**2**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**13**
Option 2-Basic model using proportion from flight distribution			**0**	**0**	**0**	**3**	**3**	**1**	**1**	**6**	**6**	**0**	**0**	**0**	**19**
Option 3-Extended model using flight height distribution															
Proportion at rotor height	(from sheet 4)	9.5%													
Potential bird transits through rotors	Flux integral	0.0178	0	0	0	15	15	3	3	29	29	0	0	0	**93**
Collisions assuming no avoidance	Collision integral	0.00027	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Average collision risk for single rotor transit		1.5%													
Stage E - applying avoidance rates															
Using which of above options?	**Option 3**	0.00%	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Collisions assuming avoidance rate	birds per month or year	95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Collisions after applying large array correction		95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**

COLLISION RISK ASSESSMENT

Sheet 2 - Overall collision risk

All data input on Sheet 1:
no data entry needed on this sheet!

from Sheet 1 - input data
from Sheet 6 - available hours
from Sheet 3 - single transit collision risk
from survey data
calculated field

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year average
Bird details:															
Species		Roseate tern													
Flight speed	m/sec	12.8													
Nocturnal activity factor (1-5)		1													
Nocturnal activity (% of daytime)		0%													
Windfarm data:															
Latitude	degrees	40.8													
Number of turbines		147													
Rotor radius	m	110													
Minimum height of rotor	m	127													
Total rotor frontal area	sq m	5587951													
Proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	90.3%
Stage A - flight activity															
Daytime areal bird density	birds/sq km		0	0	0	0.04	0.02	0	0	0	0	0	0	0	
Proportion at rotor height	%	6.0%													
Total daylight hours per month	hrs		298	297	369	398	447	451	458	428	375	346	299	289	
Total night hours per month	hrs		446	375	375	322	297	269	286	316	345	398	421	455	
Flux factor			0	0	0	18594	10449	0	0	0	0	0	0	0	
Option 1 -Basic model - Stages B, C and D															**per annum**
Potential bird transits through rotors			0	0	0	1116	627	0	0	0	0	0	0	0	**1743**
Collision risk for single rotor transit	(from sheet 3)	4.4%													
Collisions for entire windfarm, allowing for non-op time, assuming no avoidance	birds per month or year		**0**	**0**	**0**	**44**	**24**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**68**
Option 2-Basic model using proportion from flight distribution			**0**	**0**	**0**	**70**	**38**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**109**
Option 3-Extended model using flight height distribution		Roseate tern													
Proportion at rotor height	(from sheet 4)	9.5%													
Potential bird transits through rotors	Flux integral	0.0178	0	0	0	332	186	0	0	0	0	0	0	0	**518**
Collisions assuming no avoidance	Collision integral	0.00027	**0**	**0**	**0**	**5**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**
Average collision risk for single rotor transit		1.5%													
Stage E - applying avoidance rates															
Using which of above options?	**Option 3**	0.00%	0	0	0	5	3	0	0	0	0	0	0	0	**7**
	birds per month														
Collisions assuming avoidance rate	or year	95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Collisions after applying large array correction		95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**

COLLISION RISK ASSESSMENT
Sheet 1 - Input data

used in overall collision risk sheet
used in migrant collision risk sheet
used in single transit collision risk sheet or extended model
used in available hours sheet
used in large array correction sheet
not used in calculation but stated for reference

	Units	Value	Data sources	Source
Bird data				
Species name		**Roseate tern**		
Bird length	m	0.37		Gilbert et al 2022, Table A12
Wingspan	m	0.76		Gilbert et al 2022, Table A12
Flight speed	m/sec	12.8		Gilbert et al 2022, Table A12
Nocturnal activity factor (1-5)		1		Table A-8, Robinson Willmott et al., 2013 value = 1 (PL data confirms)
Flight type, flapping or gliding		flapping		

Bird survey data			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Data sources	Source
Daytime bird density	birds/sq km					0.04	0.02									HiRes Aerial Surveys Table 12, b Lease area
Proportion at rotor height	%	6.0%														
Proportion of flights upwind	%	37.5%														

Birds on migration data															Data sources	Source
Migration passages	birds					4331	4331	817	817	8657	8657					Adult, fledglings, non-breeding, numbers devived from Mostello unpub data & Nisbet et al 2014
Width of migration corridor	km	135														Migration front is Block Island to Monomoy
Proportion at rotor height	%	6%														Loring et al 2019, Table 18 Fed waters
Proportion of flights upwind	%	37.5%														Loring et al 2019, Fig 50

	Units	Value	Data sources	Source
Windfarm data				
Name of windfarm site		**Mayflower**		
Latitude	degrees	40.80		
Number of turbines		147		COP
Width of windfarm	km	39		Measured from BA Fig. 1
Tidal offset	m	1		

	Units	Value	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Data sources	Source
Turbine data																
Turbine model		**>15MW**														
No of blades		3														
Rotation speed	rpm	7.56														rated rpm for 15MW reference turbine, Gaertner et al 2020
Rotor radius	m	140														BA Fig. 5
Hub height	m	184														BA Fig. 5
Monthly proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%		Whitney Marsh email 8/8/22 (placeholder)
Max blade width	m	5.770														15MW blade, Gaertner et al 2020
Pitch	degrees	1														

Avoidance rates used in presenting results			Data sources (if applicable)
	95.01%	X	Cook 2021, Table A2 “All Gulls and Terns” Extended Band (2012) model
	98.00%		
	99.00%		
	99.50%		

COLLISION RISK ASSESSMENT (BIRDS ON MIGRATION)

Sheet 2 - Overall collision risk

All data input on Sheet 1:
no data entry needed on this sheet!
other than to choose option for final tables

from Sheet 1 - input data
from Sheet 6 - available hours
from Sheet 3 - single transit collision risk
from survey data
calculated field

Bird details:

Species		Roseate tern
Flight speed	m/sec	12.8
Flight type		flapping

Windfarm data:

Number of turbines		147
Rotor radius	m	140
Minimum height of rotor	m	184
Total rotor frontal area	sq m	9051557

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year average
Proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	90.3%
Stage A - flight activity															**per annum**
Migration passages			0	0	0	4331	4331	817	817	8657	8657	0	0	0	**27610**
Migrant flux density	birds/ km		0	0	0	32.081	32.0815	6.05185	6.05185	64.1259	64.1259	0	0	0	
Proportion at rotor height	%	6%													
Flux factor			0	0	0	1037	1037	196	196	2073	2073	0	0	0	
Option 1 -Basic model - Stages B, C and D															
Potential bird transits through rotors			0	0	0	66	66	13	13	133	133	0	0	0	**423**
Collision risk for single rotor transit	(from sheet 3)	3.6%													
Collisions for entire windfarm, allowing for non-op time, assuming no avoidance	birds per month or year		**0**	**0**	**0**	**2**	**2**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**13**
Option 2-Basic model using proportion from flight distribution			######	#######	######	######	**#NAME?**	**#NAME?**	**#NAME?**	**#NAME?**	**#NAME?**	**#NAME?**	**#NAME?**	**#NAME?**	**#NAME?**
Option 3-Extended model using flight height distribution															
Proportion at rotor height	(from sheet 4)	#NAME?													
Potential bird transits through rotors	Flux integral	0.0178	0	0	0	19	19	3	3	37	37	0	0	0	**118**
Collisions assuming no avoidance	Collision integral	0.00027	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Average collision risk for single rotor transit		1.5%													
Stage E - applying avoidance rates															
Using which of above options?	**Option 3**	0.00%	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Collisions assuming avoidance rate	birds per month or year	95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Collisions after applying large array correction		95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**

COLLISION RISK ASSESSMENT

Sheet 2 - Overall collision risk

All data input on Sheet 1:
no data entry needed on this sheet!

from Sheet 1 - input data
from Sheet 6 - available hours
from Sheet 3 - single transit collision risk
from survey data
calculated field

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year average
Bird details:															
Species		Roseate tern													
Flight speed	m/sec	12.8													
Nocturnal activity factor (1-5)		1													
Nocturnal activity (% of daytime)		0%													
Windfarm data:															
Latitude	degrees	40.8													
Number of turbines		147													
Rotor radius	m	140													
Minimum height of rotor	m	184													
Total rotor frontal area	sq m	9051557													
Proportion of time operational	%		94%	94%	92%	91%	88%	89%	86%	85%	87%	91%	93%	94%	90.3%
Stage A - flight activity															
Daytime areal bird density	birds/sq km		0	0	0	0.04	0.02	0	0	0	0	0	0	0	
Proportion at rotor height	%	6.0%													
Total daylight hours per month	hrs		298	297	369	398	447	451	458	428	375	346	299	289	
Total night hours per month	hrs		446	375	375	322	297	269	286	316	345	398	421	455	
Flux factor			0	0	0	23666	13299	0	0	0	0	0	0	0	
Option 1 -Basic model - Stages B, C and D															**per annum**
Potential bird transits through rotors			0	0	0	1420	798	0	0	0	0	0	0	0	**2218**
Collision risk for single rotor transit	(from sheet 3)	3.6%													
Collisions for entire windfarm, allowing for non-op time, assuming no avoidance	birds per month or year		**0**	**0**	**0**	**47**	**26**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**73**
Option 2-Basic model using proportion from flight distribution			######	#######	######	######	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?
Option 3-Extended model using flight height distribution		Roseate tern													
Proportion at rotor height	(from sheet 4)	#NAME?													
Potential bird transits through rotors	Flux integral	0.0178	0	0	0	422	237	0	0	0	0	0	0	0	**659**
Collisions assuming no avoidance	Collision integral	0.00027	**0**	**0**	**0**	**6**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**
Average collision risk for single rotor transit		1.5%													
Stage E - applying avoidance rates															
Using which of above options?	**Option 3**	0.00%	0	0	0	6	3	0	0	0	0	0	0	0	**9**
	birds per month														
Collisions assuming avoidance rate	or year	95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Collisions after applying large array correction		95.01%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		98.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.00%	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		99.50%	0	0	0	0	0	0	0	0	0	0	0	0	**0**

Summary of simulation results from SCRAM: a stochastic collision risk assessment for movement data

07 October 2022

SCRAM was developed by Biodiversity Research Institute, the University of Rhode Island, and the U.S. Fish and Wildlife Service with funding from the Bureau of Ocean Energy Management.

SCRAM run details

```
## SCRAM - the Stochastic Collision Risk Assessment for Movement version 0.91 - Brachycarpus
## was run for 1000 iterations using Option 3: slower but more accurate assessment
## Project: Mayflower
## Modeler: David Bigger
## The model run was started at: Fri Oct 07 14:58:54 2022 EDT
## The model run was completed at: Fri Oct 07 15:44:15 2022 EDT
## Run 1: the probability of exceeding specified threshold (1) is < 0.001.
## Run 2: the probability of exceeding specified threshold (1) is < 0.001.
```

Model inputs used for this analysis

Table 1: Species input parameters (mean and 95 perc. range).

Species	Turbine model	Avoidance	Wing span	Body length	Speed
Roseate Tern	15	0.93 (0.92, 0.94)	0.76 (0.72, 0.8)	0.37 (0.33, 0.41)	12.86 (3.75, 22.03)
Roseate Tern	20	0.93 (0.92, 0.94)	0.76 (0.72, 0.8)	0.37 (0.33, 0.41)	12.86 (3.75, 22.03)

Table 2: Species monthly (Jan-Jun) population estimates ± SD and assumptions/limitations as specified by the USFWS using the most recent data.

Species	Jan	Feb	Mar	Apr	May	Jun
Roseate Tern	0 ± 0	0 ± 0	0 ± 0	10916 ± 0	10916 ± 0	10916 ± 0

Table 3: Species monthly (Jul-Dec) population estimates ± SD and assumptions/limitations as specified by the USFWS using the most recent data.

Species	Jul	Aug	Sep	Oct	Nov	Dec
Roseate Tern	16251 ± 0	16251 ± 0	16251 ± 0	16251 ± 0	0 ± 0	0 ± 0

Population data assumptions/limitations:
1) Entire NW Atlantic pop could be present in area during months listed.
2) Average of most recent (2018 and 2019) productivity data from three largest colonies (representing >90 perc. of population) representative of entire population.
3) Fledging and post-breeding dispersal period occurs from July through Sept.
4) Numbers of non-breeding adults are not included.
5) Does not include non-breeding 1 and 2 year old birds that return but do not breed.
6) From Gochfeld and Burger (2020): Northeastern birds first arrive at Nantucket and Martha's Vineyard, MA, in large flocks, then disperse north as well as west. They arrive 26 Apr-20 May at Bird I., MA (Nisbet 1980, Nisbet 1981b, Nisbet 1989b), slightly later at Falkner I., CT, and Great Gull I., NY.
7) From Gochfeld and Burger (2020): Apparently all birds migrate directly from the staging area around Cape Cod across the w. North Atlantic to the West Indies (Nisbet 1984, C. Mostello). Very small numbers occur at sea off N. Carolina from late Aug to late Sep, with a peak in early Sep; the latest date was 28 Oct (D. Lee).

Table 4: Wind farm input parameters (mean and 95 perc. range).

Species	Turbine model	Num. turbines	Rotor radius	Hub height (m)	Blade width (m)	Wind speed (mps)
Roseate Tern	15	147 (147, 147)	110 (110, 110)	126 (126, 126)	5.77 (5.77, 5.77)	7.76 (6.79, 8.72)
Roseate Tern	20	147 (147, 147)	140 (140, 140)	184 (184, 184)	5.77 (5.77, 5.77)	7.74 (6.8, 8.72)

Table 5: Wind farm input parameters (mean and 95 perc. range).

Species	Turbine model	Prop. upwind	Rotor speed (rpm)	Pitch (radians)	Farm width (km)	Lat.	Long.
Roseate Tern	15	1 (1, 1)	3.71 (3.24, 4.16)	0.03 (0.03, 0.04)	39 (39, 39)	40.82	-70.31
Roseate Tern	20	1 (1, 1)	2.9 (2.55, 3.27)	0.03 (0.03, 0.04)	39 (39, 39)	40.82	-70.31

Table 6: Monthly wind farm operational data (mean and 95 perc. range) is given for each wind farm specification.

Species	Turbine model	Jan Op.	Feb Op.	Mar Op.	Apr Op.	May Op.	Jun Op.
Roseate Tern	15	87.9 (84.2, 91.7)	87.6 (84, 91.2)	85.9 (82.3, 89.5)	85.1 (81.4, 88.5)	82.8 (79.5, 86.4)	83.3 (80, 86.6)
Roseate Tern	20	87.7 (84.1, 91.7)	87.5 (84, 91)	85.9 (82.4, 89.5)	85.2 (81.5, 88.6)	82.7 (79.2, 86.2)	83.2 (79.7, 86.7)

Table 7: Monthly wind farm operational data (mean and 95 perc. range) is given for each wind farm specification.

Species	Turbine model	Jul Op.	Aug Op.	Sep Op.	Oct Op.	Nov Op.	Dec Op.
Roseate Tern	15	80.9 (77.7, 84.5)	79.6 (76.4, 82.9)	81.4 (78.2, 84.9)	85 (81.4, 88.6)	87.4 (83.6, 91)	87.7 (84, 91.2)
Roseate Tern	20	80.8 (77.4, 84.2)	79.8 (76.4, 83.1)	81.3 (77.7, 84.5)	85 (81.8, 88.4)	87.3 (83.4, 91.1)	87.7 (84.1, 91.5)

Results for the SCRAM simulation

Table 8: The predicted mean and 95 perc. prediction intervals of the number of collisions per month and the total summed monthly number of collisions and 95 perc. prediction interval. Results are not shown for months that do not have movement data.

Species	Turbine model	month	Mean number of collisions	Lower pred. interval	Upper pred. interval
Roseate Tern	15	Jan			
Roseate Tern	15	Feb			
Roseate Tern	15	Mar			
Roseate Tern	15	Apr			
Roseate Tern	15	May			
Roseate Tern	15	Jun	0	0	0.001
Roseate Tern	15	Jul	0.007	0.002	0.014
Roseate Tern	15	Aug	0.024	0.012	0.049
Roseate Tern	15	Sep	0.006	0	0.031
Roseate Tern	15	Oct			
Roseate Tern	15	Nov			
Roseate Tern	15	Dec			
Roseate Tern	15	annual	0.037	0.018	0.077
Roseate Tern	20	Jan			
Roseate Tern	20	Feb			
Roseate Tern	20	Mar			
Roseate Tern	20	Apr			
Roseate Tern	20	May			
Roseate Tern	20	Jun	0.001	0.001	0.001
Roseate Tern	20	Jul	0.001	0.001	0.001
Roseate Tern	20	Aug	0.001	0.001	0.001
Roseate Tern	20	Sep	0.001	0.001	0.001
Roseate Tern	20	Oct			
Roseate Tern	20	Nov			
Roseate Tern	20	Dec			
Roseate Tern	20	annual	0.004	0.004	0.004

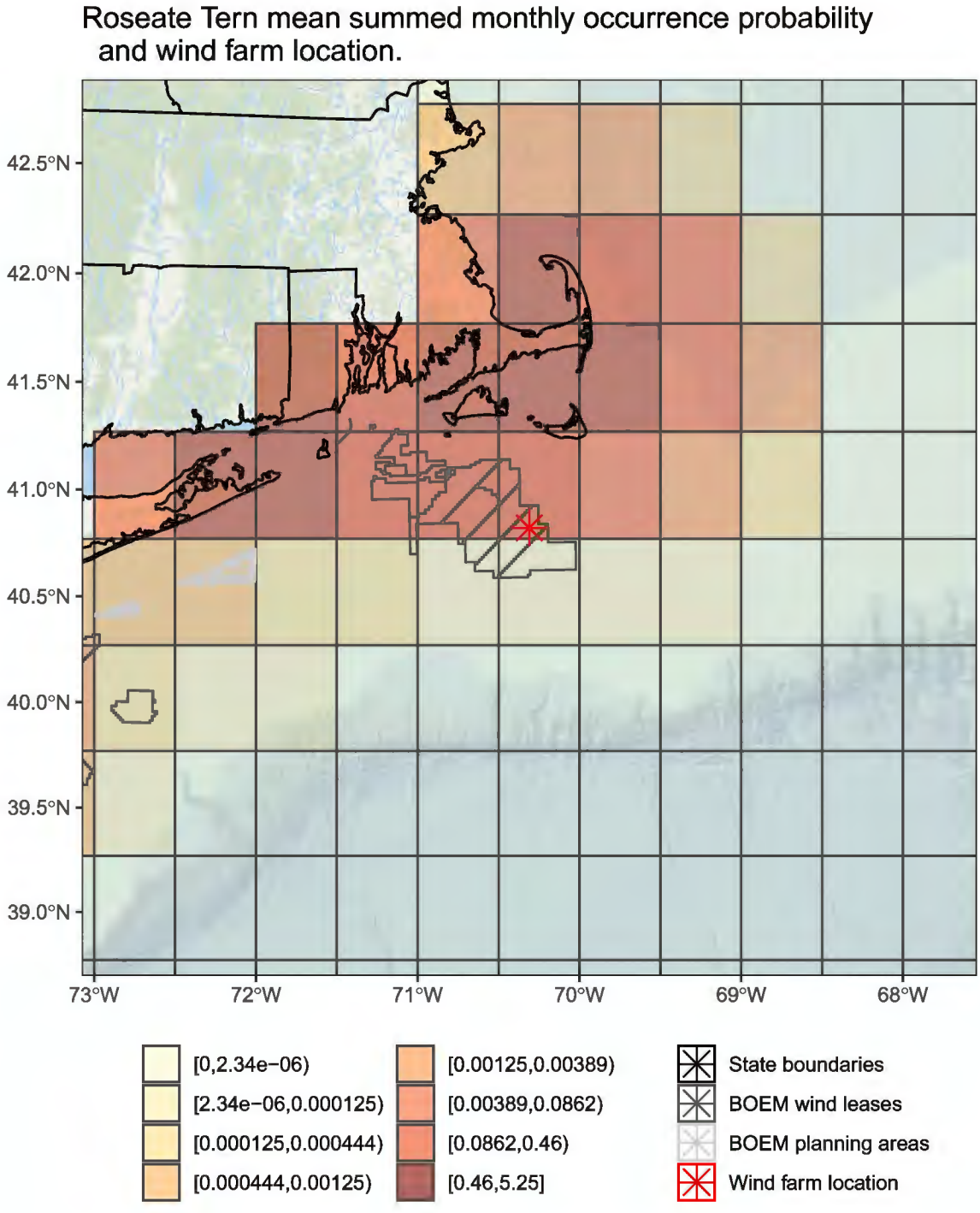


Figure 1: A map of the species occurrence probabities and wind farm location.

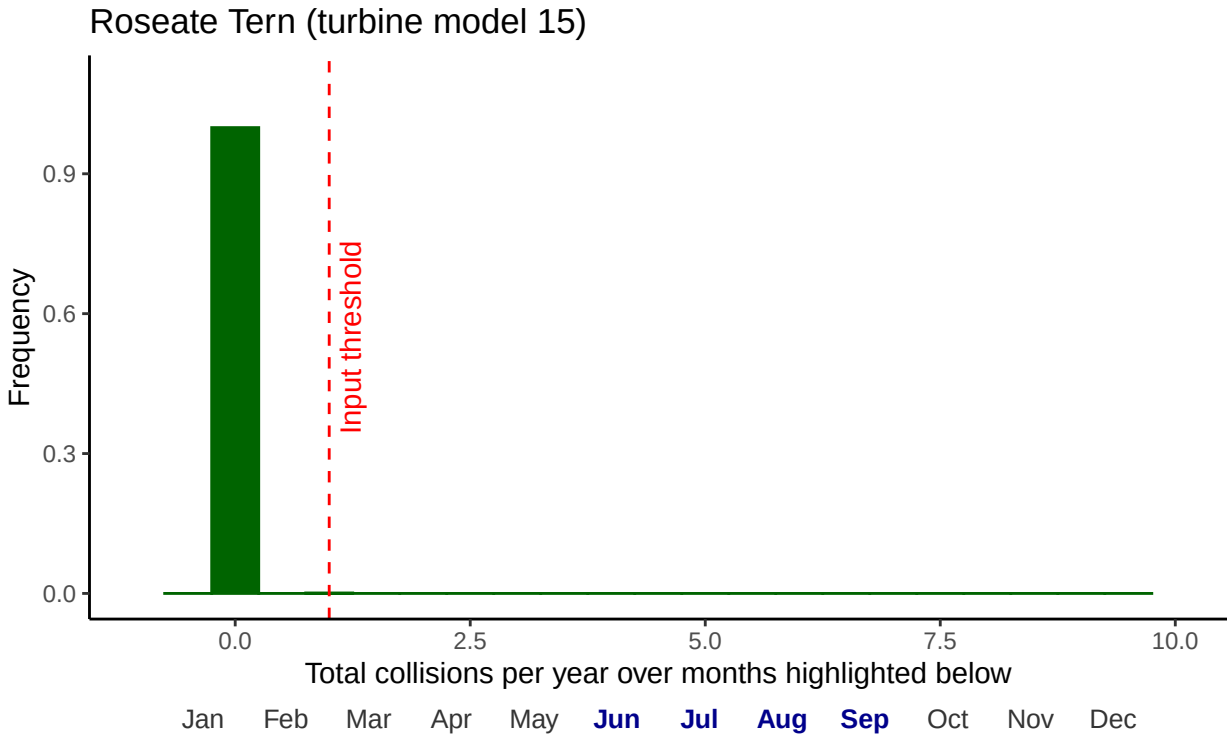


Figure 2: A frequency histogram of the total number of collisions per year. The heights of the bars show the relative frequency of each value. Months for which movement data were provided or available are shown in bold; only bold months are shown in histogram of annual collisions.

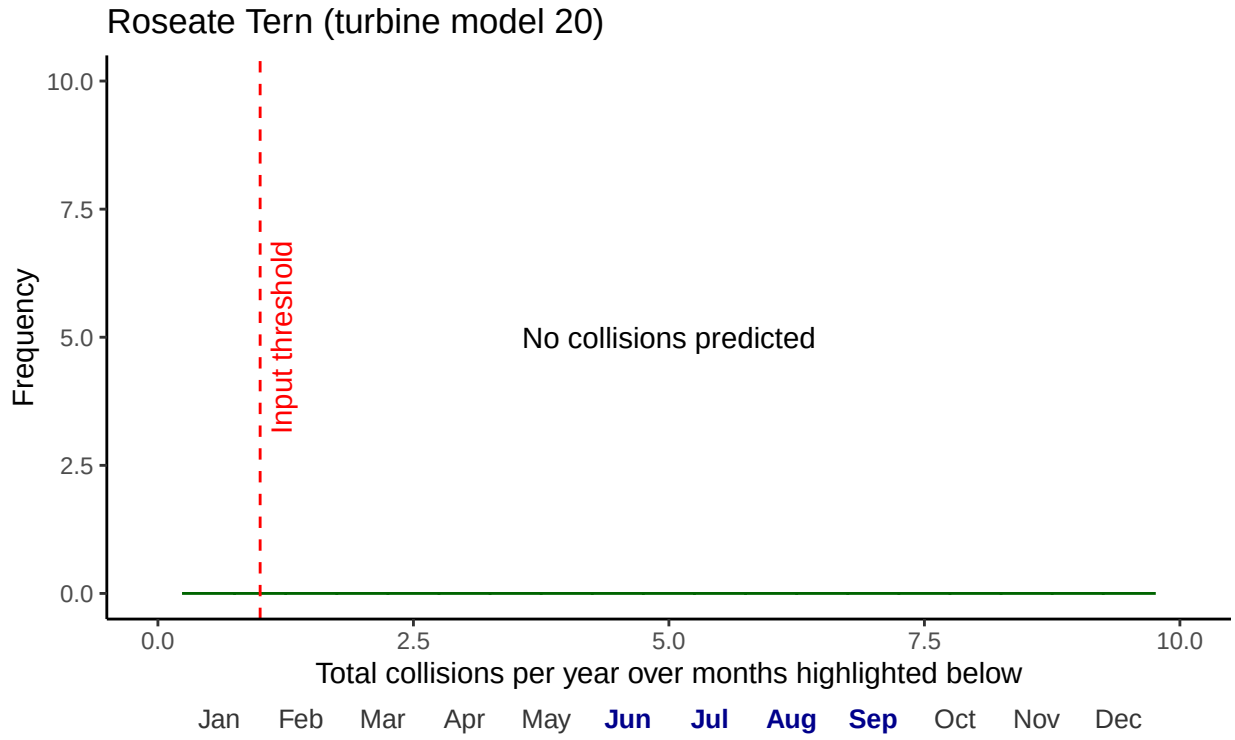
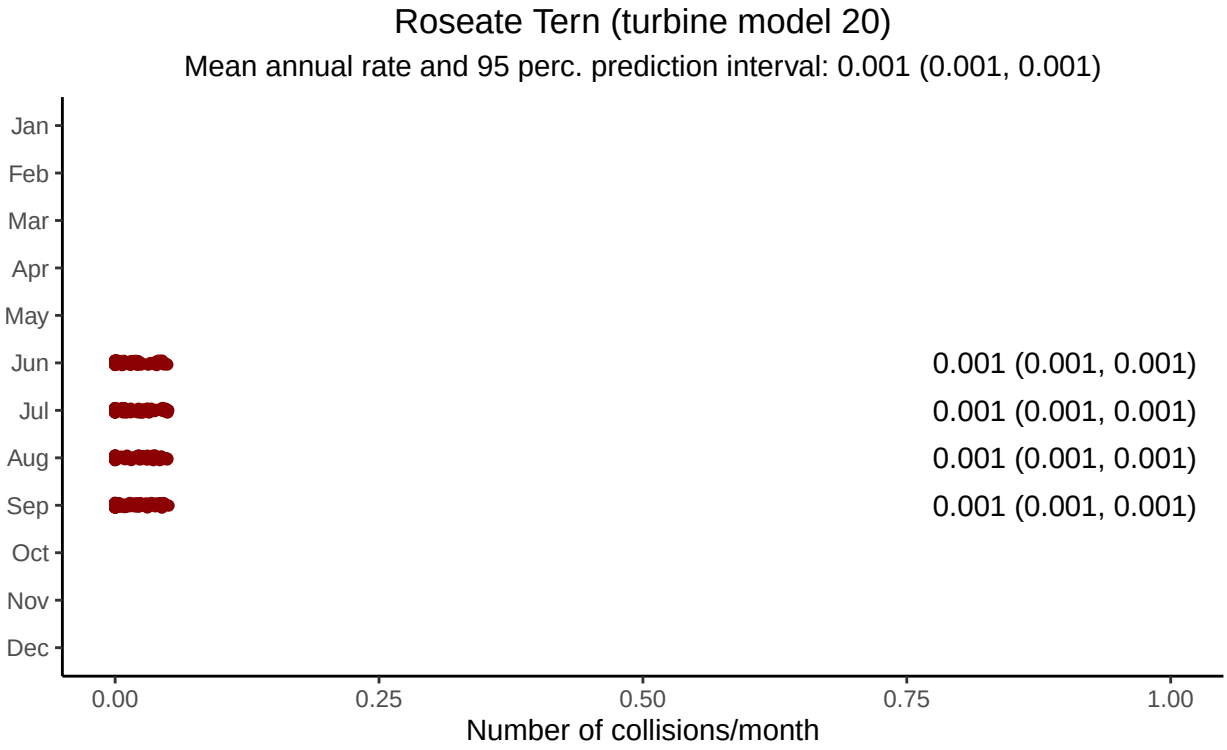


Figure 3: A frequency histogram of the total number of collisions per year. The heights of the bars show the relative frequency of each value. Months for which movement data were provided or available are shown in bold; only bold months are shown in histogram of annual collisions.



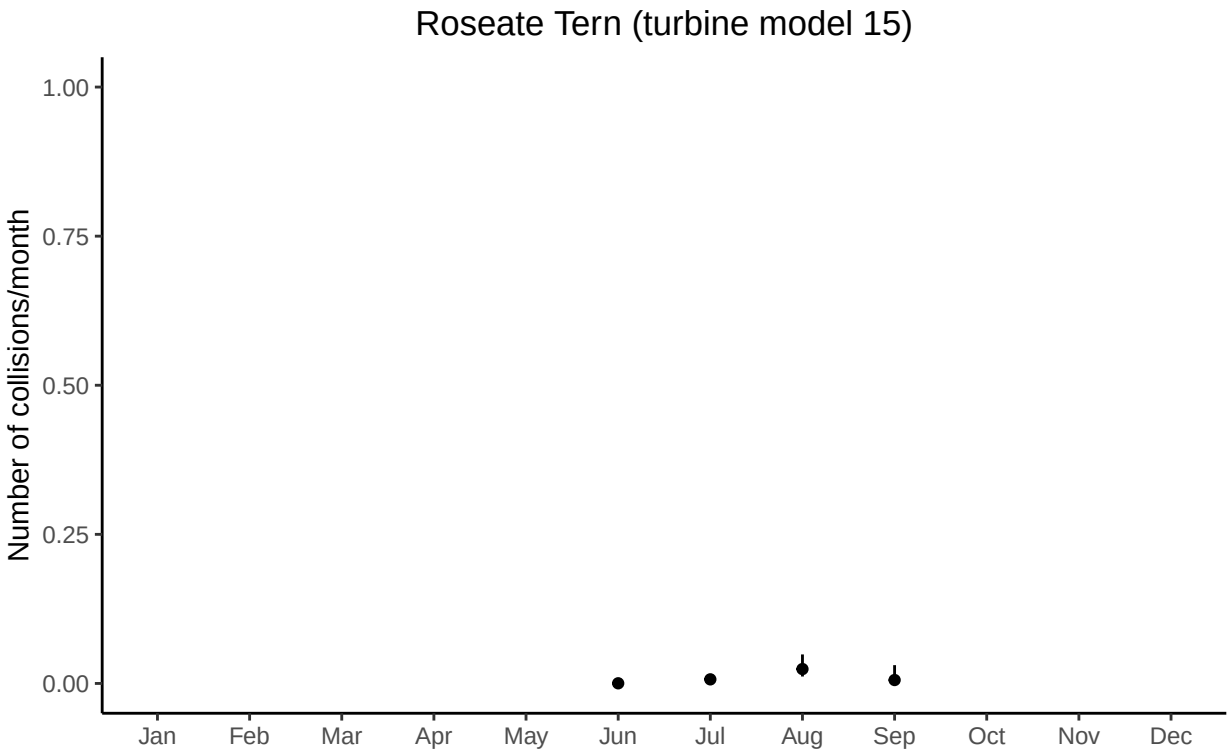


Figure 4: The predicted mean and 95 perc. prediction intervals of the number of collisions per month. Results are not shown for months that do not have movement data.

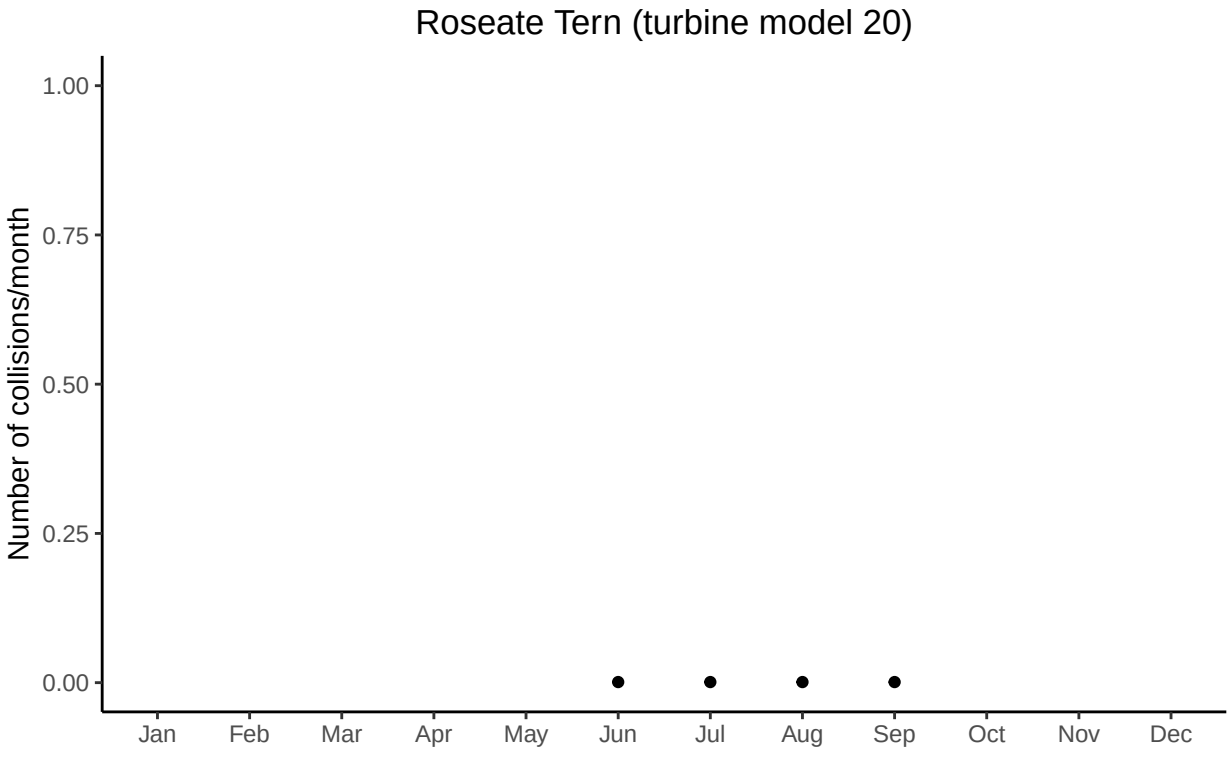


Figure 5: The predicted mean and 95 perc. prediction intervals of the number of collisions per month. Results are not shown for months that do not have movement data.

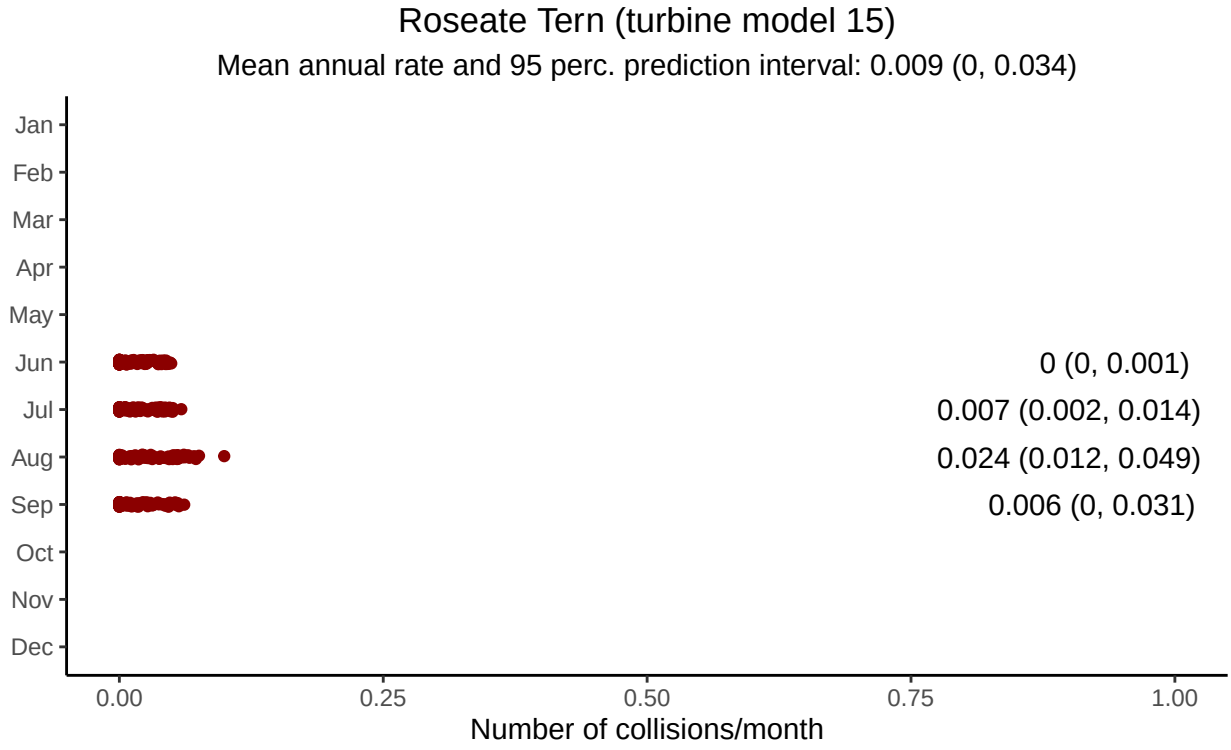


Figure 6: The mean number of collisions per month for each turbine model combination. A sample of 100 runs of the of simulation are plotted showing the typical variation among iterations. The iterations among this set that exceed the user-specified threshold for the number of collisions, if set, are shown in red; iterations below this threshold are shown in blue. Since the threshold is a yearly value, the threshold here is that value divided by 12. The annual and monthly mean (95 perc. prediction interval) for al iterations are shown at top (annual) and for each month to the right of the plot.

Summary of simulation results from SCRAM: a stochastic collision risk assessment for movement data

07 October 2022

SCRAM was developed by Biodiversity Research Institute, the University of Rhode Island, and the U.S. Fish and Wildlife Service with funding from the Bureau of Ocean Energy Management.

SCRAM run details

```
## SCRAM - the Stochastic Collision Risk Assessment for Movement version 0.91 - Brachycarpus
## was run for 1000 iterations using Option 3: slower but more accurate assessment
## Project: Mayflower
## Modeler: David Bigger
## The model run was started at: Fri Oct 07 14:07:05 2022 EDT
## The model run was completed at: Fri Oct 07 14:51:51 2022 EDT
## Run 1: the probability of exceeding specified threshold (1) is < 0.001.
## Run 2: the probability of exceeding specified threshold (1) is < 0.001.
```

Model inputs used for this analysis

Table 1: Species input parameters (mean and 95 perc. range).

Species	Turbine model	Avoidance	Wing span	Body length	Speed
Piping Plover	15	0.93 (0.92, 0.94)	0.38 (0.38, 0.38)	0.18 (0.17, 0.18)	12.08 (3.44, 21.12)
Piping Plover	20	0.93 (0.92, 0.94)	0.38 (0.38, 0.38)	0.18 (0.17, 0.18)	12.08 (3.44, 21.12)

Table 2: Species monthly (Jan-Jun) population estimates ± SD and assumptions/limitations as specified by the USFWS using the most recent data.

Species	Jan	Feb	Mar	Apr	May	Jun
Piping Plover	0 ± 0	0 ± 0	4578 ± 0	4578 ± 0	4578 ± 0	4578 ± 0

Table 3: Species monthly (Jul-Dec) population estimates ± SD and assumptions/limitations as specified by the USFWS using the most recent data.

Species	Jul	Aug	Sep	Oct	Nov	Dec
Piping Plover	4578 ± 0	7423 ± 0	7423 ± 0	7423 ± 0	0 ± 0	0 ± 0

Population data assumptions/limitations:
1) Entire Atlantic coast population could be present in area during months listed.
2) Occurrence through October to include birds stopping over in mid-Atlantic (e.g. North Carolina). Number of birds still present in Atlantic likely lower.
3) Estimate of HY fledges, uses the 20-year (2002 - 2021) average productivity (unweighted).

Table 4: Wind farm input parameters (mean and 95 perc. range).

Species	Turbine model	Num. turbines	Rotor radius	Hub height (m)	Blade width (m)	Wind speed (mps)
Piping Plover	15	147 (147, 147)	110 (110, 110)	126 (126, 126)	5.77 (5.77, 5.77)	7.92 (6.88, 9)
Piping Plover	20	147 (147, 147)	140 (140, 140)	184 (184, 184)	5.77 (5.77, 5.77)	7.94 (6.71, 9.07)

Table 5: Wind farm input parameters (mean and 95 perc. range).

Species	Turbine model	Prop. upwind	Rotor speed (rpm)	Pitch (radians)	Farm width (km)	Lat.	Long.
Piping Plover	15	1 (1, 1)	3.78 (3.29, 4.3)	0.03 (0.03, 0.04)	39 (39, 39)	40.82	-70.31
Piping Plover	20	1 (1, 1)	2.98 (2.52, 3.4)	0.03 (0.03, 0.04)	39 (39, 39)	40.82	-70.31

Table 6: Monthly wind farm operational data (mean and 95 perc. range) is given for each wind farm specification.

Species	Turbine model	Jan Op.	Feb Op.	Mar Op.	Apr Op.	May Op.	Jun Op.
Piping Plover	15	87.9 (84.4, 91.4)	87.6 (84.2, 91.4)	86 (82.6, 89.5)	85.1 (81.4, 88.7)	82.8 (79.6, 86.2)	83.4 (79.8, 86.7)
Piping Plover	20	87.9 (84.5, 91.8)	87.7 (84.2, 91.1)	85.8 (82.1, 89.6)	85 (81.6, 88.3)	82.8 (79.5, 86)	83.2 (79.6, 86.7)

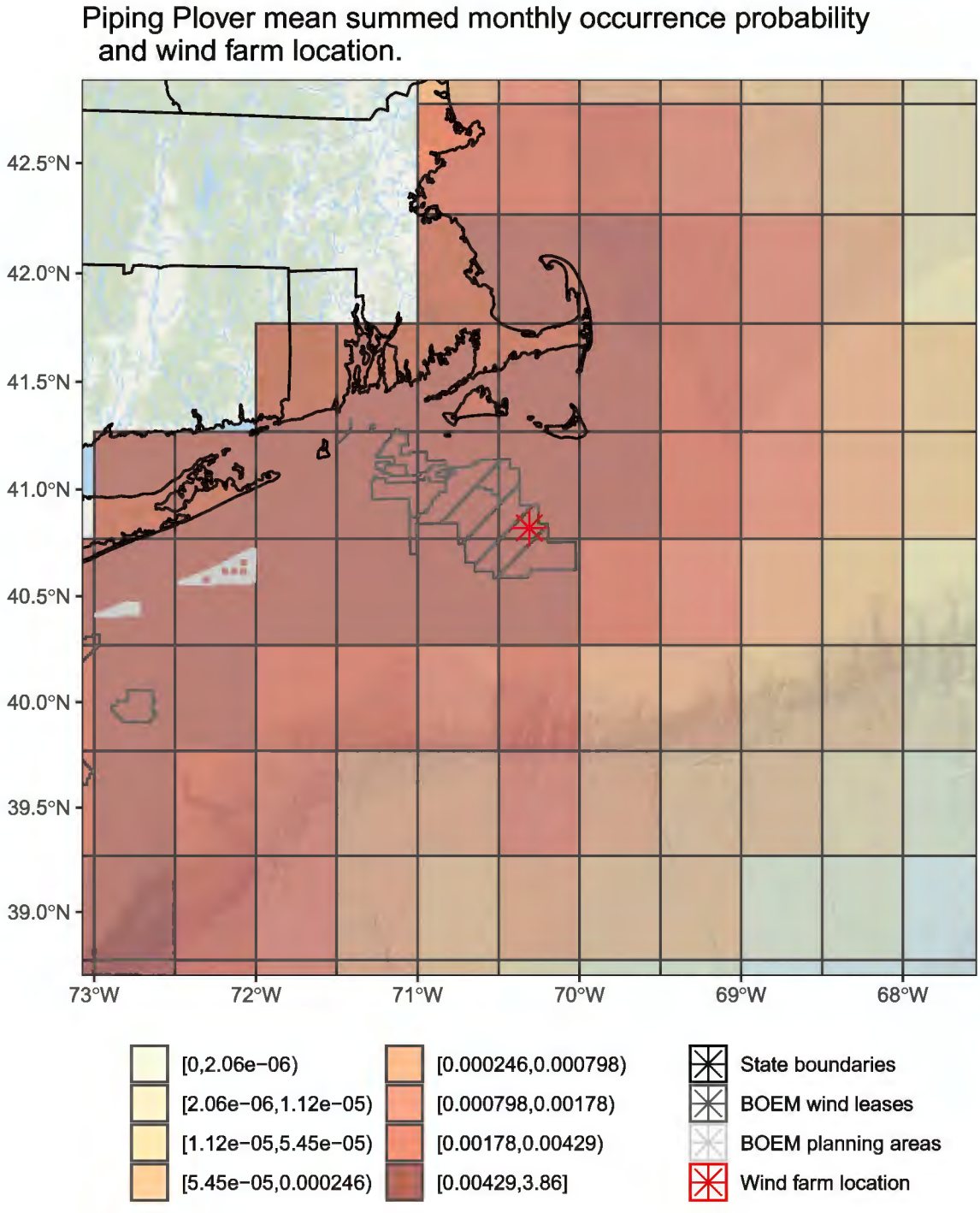
Table 7: Monthly wind farm operational data (mean and 95 perc. range) is given for each wind farm specification.

Species	Turbine model	Jul Op.	Aug Op.	Sep Op.	Oct Op.	Nov Op.	Dec Op.
Piping Plover	15	80.9 (77.5, 84.3)	79.7 (76.3, 83)	81.3 (77.7, 84.8)	85 (81.5, 88.7)	87.5 (83.7, 91.1)	87.8 (84.2, 91.5)
Piping Plover	20	80.9 (77.3, 84.3)	79.8 (76.6, 83.2)	81.3 (77.8, 84.9)	85.1 (81.5, 88.5)	87.4 (83.8, 90.8)	87.8 (84.4, 91.4)

Results for the SCRAM simulation

Table 8: The predicted mean and 95 perc. prediction intervals of the number of collisions per month and the total summed monthly number of collisions and 95 perc. prediction interval. Results are not shown for months that do not have movement data.

Species	Turbine model	month	Mean number of collisions	Lower pred. interval	Upper pred. interval
Piping Plover	15	Jan			
Piping Plover	15	Feb			
Piping Plover	15	Mar			
Piping Plover	15	Apr			
Piping Plover	15	May	0	0	0
Piping Plover	15	Jun	0.002	0.001	0.003
Piping Plover	15	Jul	0.002	0.001	0.003
Piping Plover	15	Aug	0.001	0	0.003
Piping Plover	15	Sep	0	0	0
Piping Plover	15	Oct			
Piping Plover	15	Nov			
Piping Plover	15	Dec			
Piping Plover	15	annual	0.004	0.003	0.007
Piping Plover	20	Jan			
Piping Plover	20	Feb			
Piping Plover	20	Mar			
Piping Plover	20	Apr			
Piping Plover	20	May	0	0	0
Piping Plover	20	Jun	0.003	0.002	0.004
Piping Plover	20	Jul	0.003	0.002	0.004
Piping Plover	20	Aug	0.001	0	0.004
Piping Plover	20	Sep	0	0	0
Piping Plover	20	Oct			
Piping Plover	20	Nov			
Piping Plover	20	Dec			
Piping Plover	20	annual	0.006	0.004	0.01



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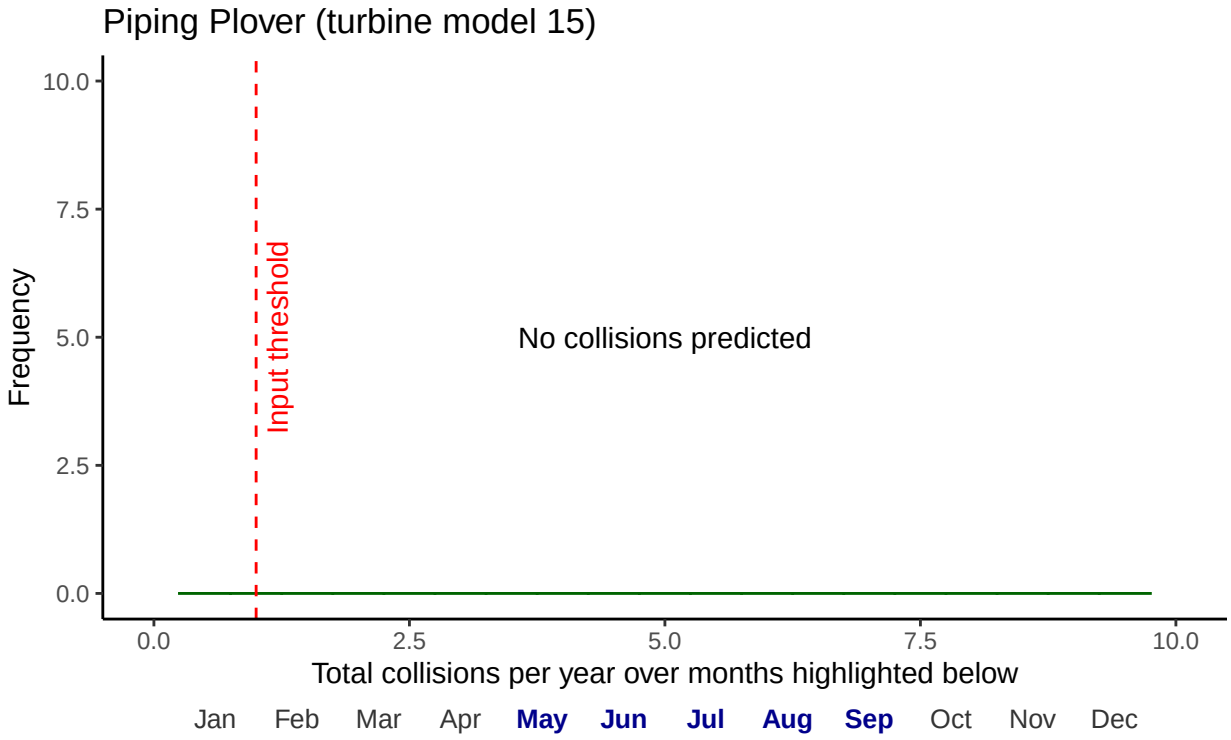

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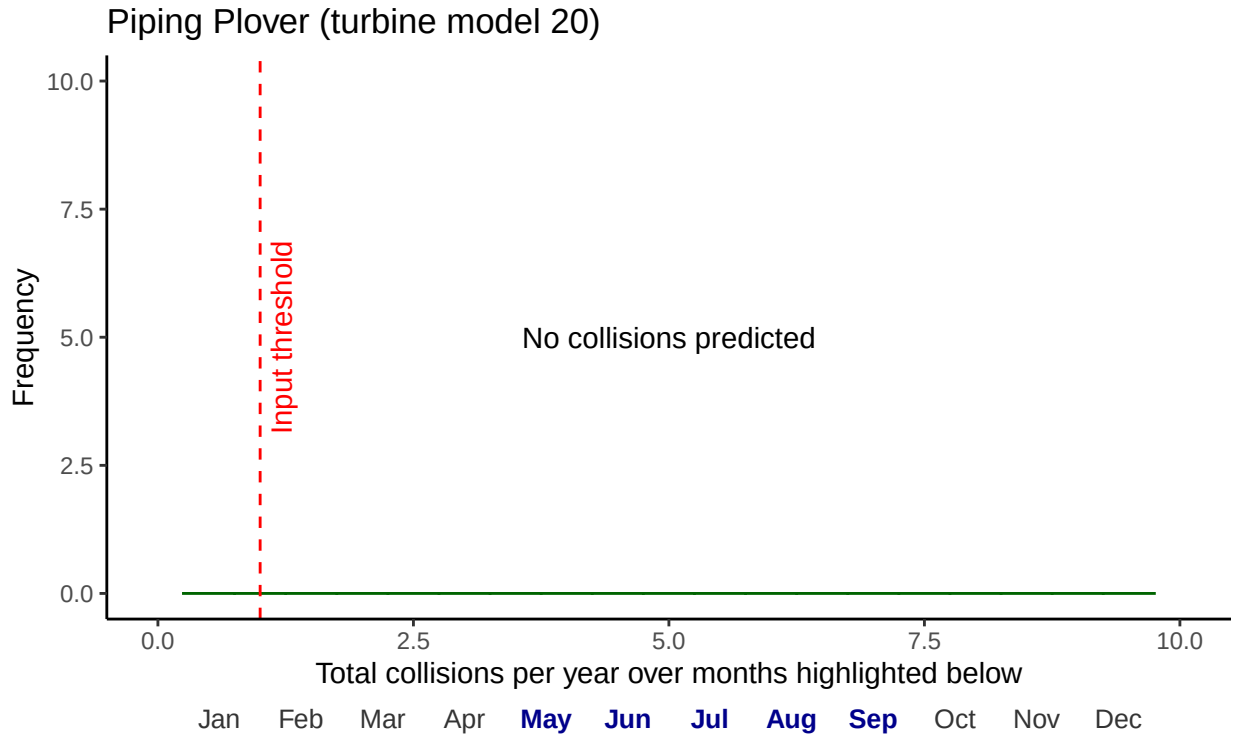

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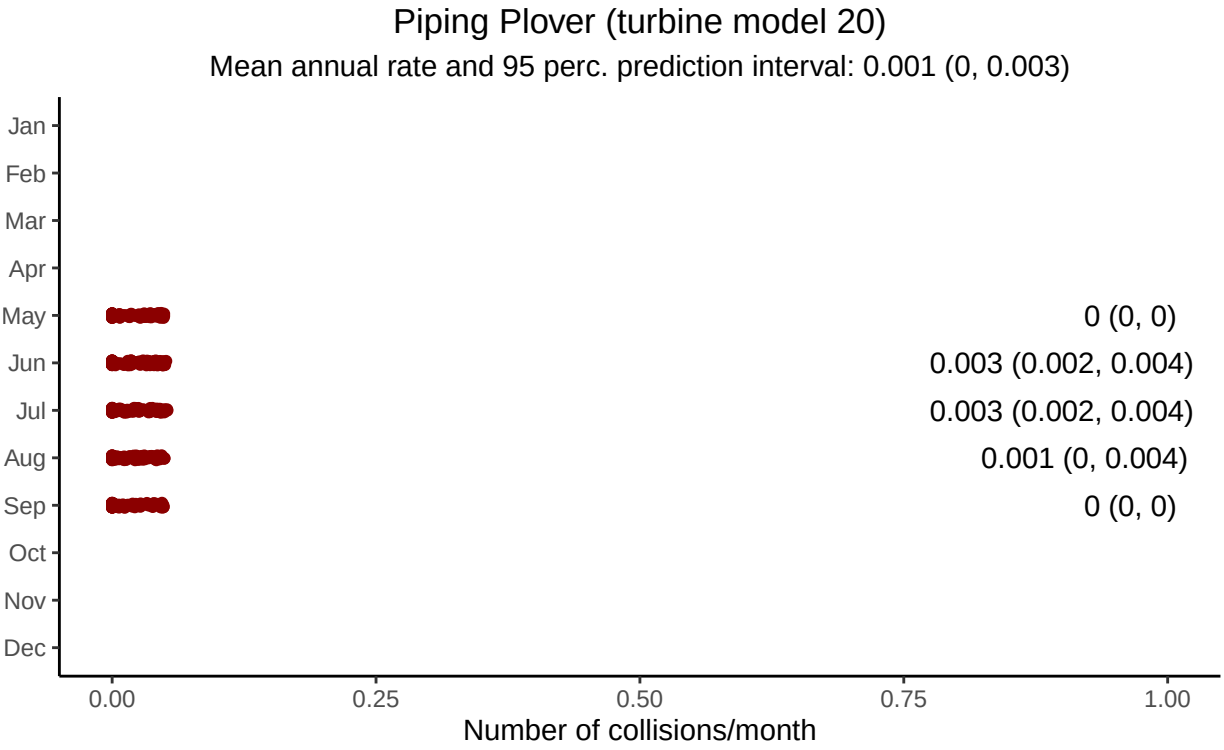


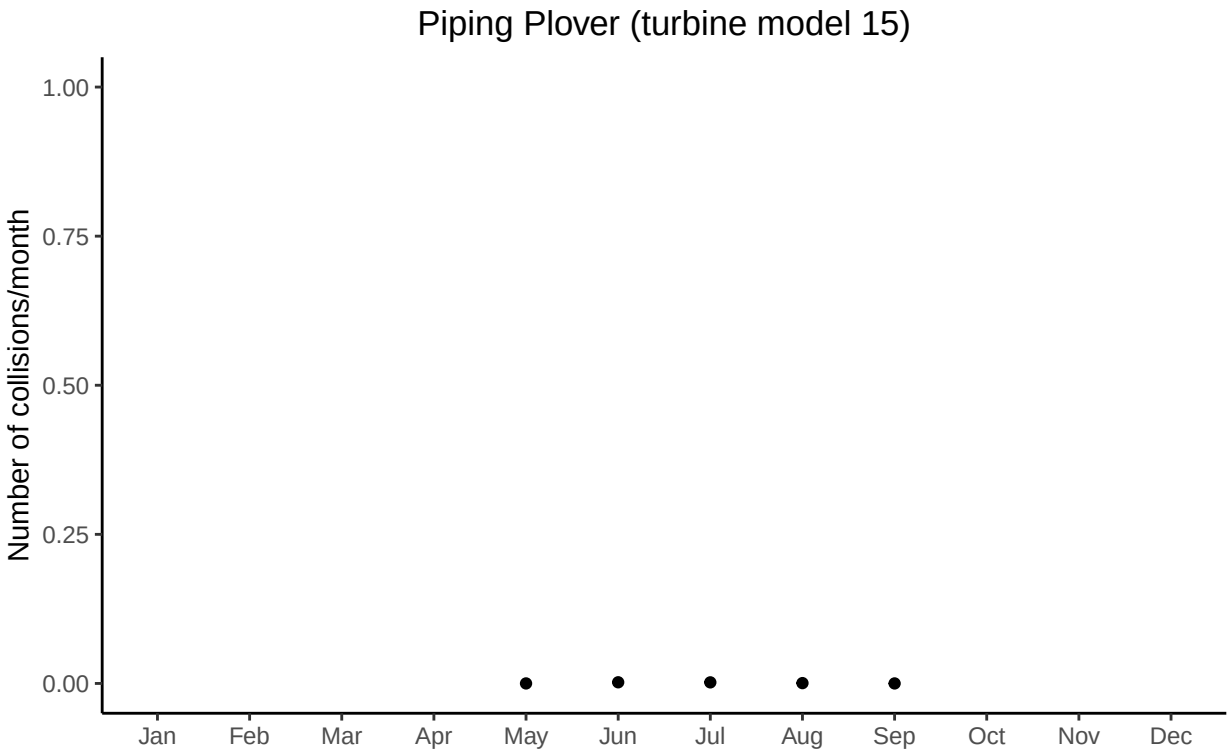
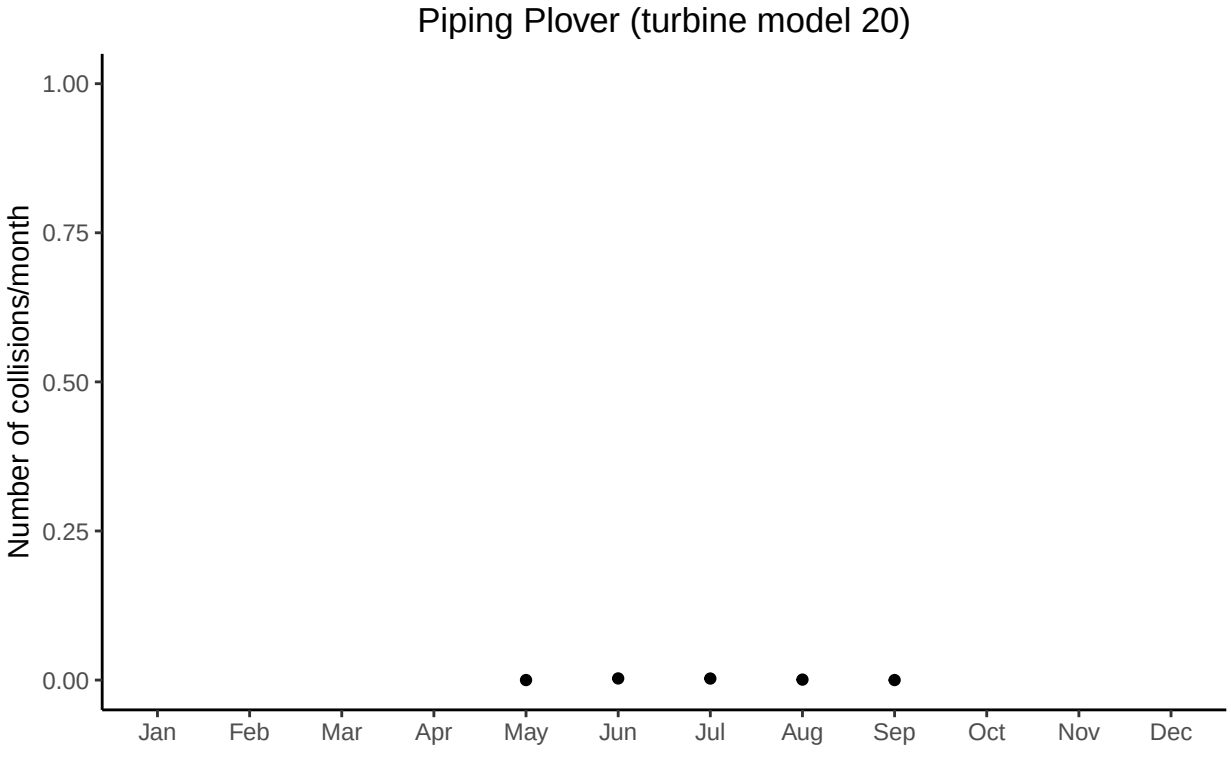


Figure 4: The predicted mean and 95 perc. prediction intervals of the number of collisions per month. Results are not shown for months that do not have movement data.



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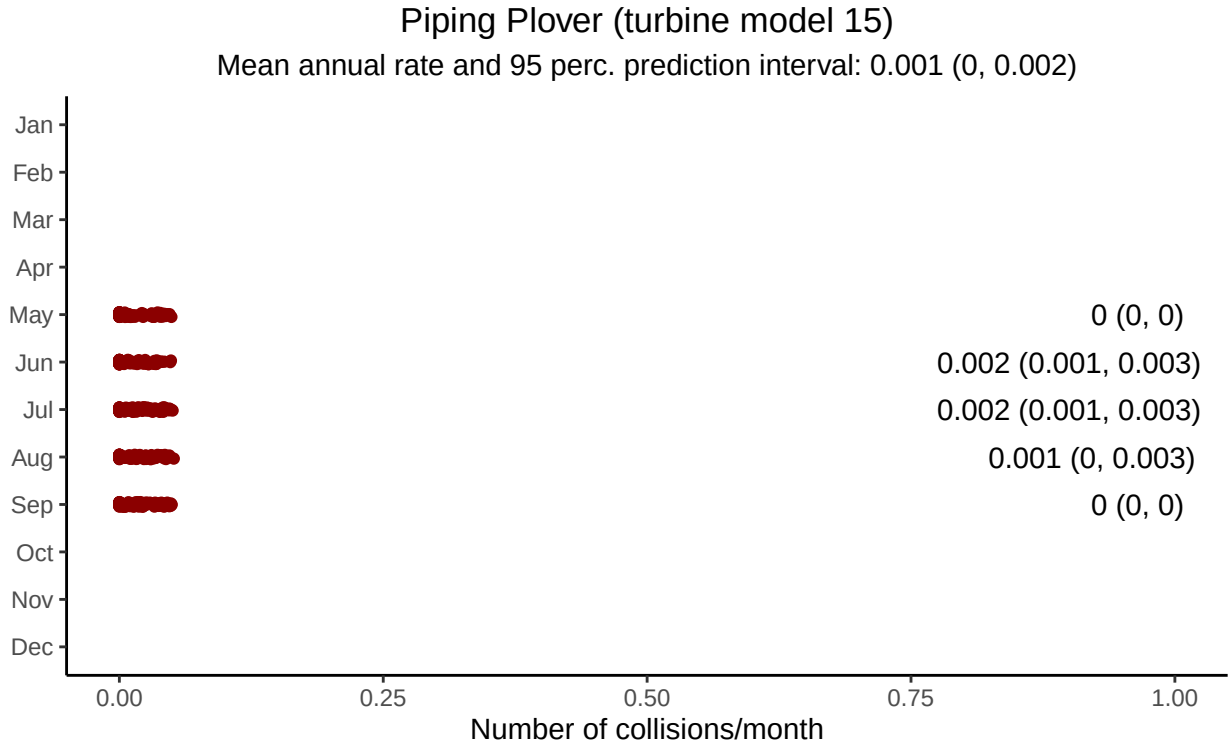

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Appendix C Draft Avian and Bat Monitoring Framework

MAYFLOWER WIND

Mayflower Wind Draft Post-Construction Avian and Bat Monitoring Framework

Document Revision A

Issue Date November 21, 2022

Table of Contents

List of Tables

Glossary

Acronym	Definition
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
cm	centimeter
COP	Construction and Operations Plan
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ft	feet
FAA	Federal Aviation Administration
GPS	Global Positioning System
kt	knots
m	meter
MA/RI WEA	Massachusetts and Rhode Island Wind Energy Area
MESA	Massachusetts Endangered Species Act
nm	nautical mile
NEPA	National Environmental Policy Act
OCS	Outer Continental Shelf
OEC	Offshore Export Cable
OSP	Offshore Substation Platform
RINHP	Rhode Island Natural Heritage Program
RSZ	Rotor swept zone
USGS	United States Geological Society
USFWS	United States Fish and Wildlife Service
WTG	Wind Turbine Generator

1. Introduction

Mayflower Wind Energy LLC (Mayflower Wind), a 50:50 joint venture between Shell New Energies US LLC and OW North America LLC, proposes an offshore wind renewable energy generation project (the Project) located in federal waters off the southern coast of Massachusetts in the Outer Continental Shelf (OCS) Lease Area OCS-A 0521 (Lease Area). The Project will consist of 149 positions to be occupied by wind turbine generators (WTGs) and offshore substation platforms (OSPs). This draft *Mayflower Wind Avian and Bat Monitoring Framework* (the Framework) pertains to the offshore portions of the Project within the Lease Area only and does not apply to the offshore export cables, cable landfall sites, or onshore portions of the Project.

For the development of the Construction and Operations Plan (COP), Mayflower Wind conducted an Avian Exposure Risk Assessment (COP Appendix I1) and a Bat Risk Assessment (COP Appendix I2). To support the development of the Avian Exposure Risk Assessment, Mayflower Wind conducted high-definition aerial surveys of the Lease Area from November 2019 through October 2020. The data collected were based on images captured using a grid-based survey design with a 1.5-centimeter (cm) resolution ground sampling distance. Digital still imagery was captured during each survey, each of which employed a global positioning system (GPS)-linked camera platform using a flight management system to ensure the survey tracks were flown with a high degree of accuracy over the Mayflower Wind Lease Area. The survey altitude was held at approximately 414.5 meters (m; 1,360 feet [ft]) to optimize coverage and minimize interference from cloud cover, and the aircraft was flown at a target ground speed of approximately 120 knots (kt) to reduce motion blur and ensure high image quality. The aerial digital survey captured images along nine lines spaced approximately 2 km across-track within the Lease Area and 1 nautical mile (nm) buffer. The captured images covered a minimum of 40% of the transect area per survey (i.e., approximately 6,233 hectares [15,403 acres]; sample area). Surveys were conducted monthly and sampling effort was increased during the migratory period for terns and other species of concern.

1.1 Avoidance and Minimization Measures

Mayflower Wind has taken steps to avoid, minimize, and mitigate impacts to birds and bats during Project construction, operation, and decommissioning. The Lease Area is located approximately 25 nm south of Martha's Vineyard and 20 nm south of Nantucket, Massachusetts. This offshore location for the siting of the WTGs and OSPs will help to avoid exposure to coastal birds and bats.

During construction, Mayflower Wind will minimize lighting, to the extent practicable, to reduce potential attraction of birds and bats to vessels and structures. Mayflower Wind will ensure that lighting on WTGs will be executed in accordance with Federal Aviation Administration (FAA) regulations and lighting on OSPs will be minimized to that required for navigation safety to reduce potential attraction of birds and bats to the extent practicable. During operations, Mayflower Wind will significantly minimize Project lighting that would attract birds and bats by implementing an Aircraft Detection Lighting System (ADLS) that is expected to limit FAA and BOEM required lighting to less than five minutes per year (see COP Appendix Y3, Aircraft Detection Lighting System Efficacy Analysis).

1.2 Monitoring Goals and Objectives

This Framework serves to outline Mayflower Wind's approach to post-construction avian and bat monitoring, overarching monitoring objectives, proposed monitoring elements, and reporting requirements. The measures proposed herein are intended to support the advancement of the understanding of bird and bat interactions and

address the uncertainty on bird and bat use (particularly for federally listed species) of the offshore environment and the potential collision impacts from operating the offshore Project components. The scope of monitoring in this draft Framework is designed to meet federal requirements 30 CFR 585.626(b)(15) and 585.633(b) and is scaled to the size and risk profile of the Project with a focus on species of conservation concern (e.g., federally- and state-listed species). This draft Framework will also support the Bureau of Ocean Energy Management's (BOEM) Endangered Species Act Section 7 Consultation and the Environmental Impact Statement (EIS).

A detailed *Avian and Bat Post-Construction Monitoring Plan* (Monitoring Plan), based on this Framework, will be developed in coordination with BOEM, U.S. Fish and Wildlife Service (USFWS), and other relevant regulatory agencies as the National Environmental Policy Act (NEPA) process for the Project progresses. Where feasible, monitoring conducted in the Lease Area will be coordinated with monitoring at other offshore wind projects in the Massachusetts and Rhode Island Wind Energy Areas (MA/RI WEAs) to facilitate integrated analyses across a broader geographic area. **Table 1** below highlights the proposed avian and bat monitoring objectives and methods.

Table 1. Monitoring Objectives, General Approaches to be Used, and Types of Data Generated

Taxa	Monitoring Objective	Approach	Duration	Time of Year	Data Output
Bats	Monitor occurrence of bats	Acoustics	2 years	Late winter/ early spring – late fall/early winter	Presence; temporal & weather patterns
Birds	Monitor use by ESA-listed birds	Radio-tags	Up to 3 years	Spring, Summer, Fall	Presence; temporal & weather patterns
Birds	Monitor use by nocturnal migratory birds	Radar	Up to 2 years	TBD	Presence; temporal & weather patterns
Birds	Monitor movement of marine birds around WTGs	Radar	Up to 2 years	TBD	Species, flight height, activity, avoidance behavior
Both	Document mortality	Incidental Observations	Project lifetime	All year	Incidence, identification

2. Bat Acoustic Monitoring

Although little is known about bat migration and movements over marine habitats, both historical and contemporary records have documented bat offshore activity in North America. Several bat species have been observed roosting on ships and offshore installations at sea (Stantec, 2018; Thompson et al., 2015; Ahlén et al., 2009) or at remote islands (Johnson et al., 2011; Cryan & Brown, 2007), suggesting some level of movements over water. Mayflower Wind plans to conduct bat acoustic monitoring to assess bat activity within the Lease

Area, targeting key data gaps related to species presence/composition, temporal patterns of activity, and correlation with weather and atmospheric conditions.

Acoustic monitoring of bat presence will be conducted for 2 years post-construction. Appropriate bat detector devices will be installed on various offshore Project components in the Lease Area in early spring or late winter and removed in late fall or early winter after migration, or the most appropriate period. Mayflower Wind will work with BOEM, USFWS, and other relevant regulatory agencies to determine the optimal monitoring locations and durations. The detector devices will record calls of both cave-hibernating bats, including the northern long-eared bat (*Myotis septentrionalis*), and migratory tree bats. The resulting information can be used to identify bats to species. All acoustic data recorded will be processed with approved software to filter out poor-quality data and identify the presence of bat calls. High-frequency calls can then be classified by an experienced acoustician to the highest resolution possible (e.g., species, genus, family).

Collected bat call data will be identified and analyzed to understand relationships with time of day, season, and weather/atmospheric conditions to the extent practicable. The results will provide information on bat presence offshore and the conditions under which they may occur near offshore Project components.

3. Motus Tracking Network and Use by ESA-Listed Birds Study

A total of 83 marine bird species are known to regularly occur off the coast of the eastern United States (Nisbet et al., 2013). Mayflower Wind has conducted an Avian Exposure Risk Assessment (COP Appendix I1) to identify marine and coastal bird species listed as threatened or endangered under the Endangered Species Act (ESA), Massachusetts Endangered Species Act (MESA) (including Special Concern species) and/or Rhode Island Natural Heritage Program (RINHP) that may be present within the Offshore Project Area. To gain a better understanding of the presence and movements of ESA-listed birds in the Lease Area, Mayflower Wind plans to install offshore automated telemetry receiving stations (Motus receivers) and contribute funding to radio-tagging efforts to address this existing data gap. The exact species to be studied will be determined in consultation with federal agencies and will depend on existing, ongoing field efforts. The Motus receivers will also provide opportunistic presence/absence data on other species carrying Motus tags, such as migratory songbirds and bats.

Movements of radio-tagged ESA-listed birds in the vicinity of the Lease Area will be monitored for up to three years post-construction, during the spring, summer, and fall. Motus receivers will be installed within the Lease Area to determine the presence/absence of ESA-listed species. The specific number and location of offshore receiver stations will be selected in accordance with research needs. Mayflower Wind will work with USFWS to determine appropriate funding and support to be provided to researchers working with ESA-listed birds.

ESA-listed bird presence/absence in the Lease Area will be analyzed by comparing detections within the Lease Area to coastal receiver towers. All detections can be analyzed to understand relationships with time of day, season, and weather.

4. Radar Monitoring: Nocturnal Migrants

Nocturnal migrants, including songbirds and shorebirds, are documented to fly offshore (Adams et al. 2015, Loring et al. 2021). Breeding songbirds that occur in the region are mostly neotropical migrants, flying north to south along the U.S. Atlantic Coast to the tropical regions of Mexico, the Caribbean, and Central and South America.

During migration, songbirds mostly travel at night at high altitudes and regularly cross large bodies of water, including the Mediterranean Sea and the Gulf of Mexico (Bruderer & Lietchi, 1999; Gauthreaux & Belser, 1999). Various songbird species may traverse the Lease Area during migration periods. During migration, most songbirds fly at altitudes between 295 to 1,969 ft (90 and 600 m) (NYSERDA, 2015), with a large proportion of migratory movements occurring above the rotor swept zone (RSZ) of most offshore WTGs. However, flight heights vary according to species and conditions. For shorebird species, evidence suggests that many species migrate at flight heights over 2,000 feet (610 m), which are above the RSZ of most offshore WTGs (approximately 837 ft [255 m]) as described in Senner et al. (2018) and Green (2004). It is therefore expected that shorebird occurrence in the Lease Area for most species is possible but is expected to be uncommon and limited to spring and fall migration periods.

Since nocturnal migration events are episodic and cannot be detected during daytime surveys, there is uncertainty on the timing and intensity of migration offshore. Similar to other MA/RI WEA offshore wind projects, Mayflower Wind is considering conducting a one-to-two-year radar study to record the passage rates (flux) of migrants and their flight heights. Specific radar system(s), location, time of year, and methodology will be determined in consultation with USFWS closer to the commencement of Project operations. The results of such radar monitoring could be related to time of year and weather conditions, to increase the understanding on when nocturnal migrants may have higher collision risk.

5. Radar Monitoring: Marine Bird Avoidance

Some marine birds, including loons and sea ducks, have been shown to exhibit avoidance of offshore wind farms (Furness et al., 2013). Loons are among the species identified as most vulnerable to displacement (Heinänen et al., 2020; Furness et al., 2013; Garthe & Hüppop, 2004). Sea ducks are also vulnerable to displacement. Avoidance behavior has been documented for several species, including black scoter and common eider (Desholm & Kahlert, 2005, Larsen & Guillemette, 2007) and studies have also documented sea ducks increasing their altitude to avoid WTGs at night (Desholm & Kahlert, 2005). Mayflower Wind is considering conducting up to 2 years of radar study to collect data on macro (and potentially meso) avoidance rates. The radar would run continuously to collect data at times when birds vulnerable to displacement are present. These data on macro-avoidance would support understanding of both displacement and collision vulnerability.

6. Documentation of Dead and Injured Birds and Bats

Several factors influence the risk of collision with offshore wind project components for birds, including behavior, season, weather, and lighting. In general, species using marine habitats have exhibited lower collision rates than those documented at terrestrial wind facilities, although data from offshore operational sites are very limited (Adams et al., 2017; Thaxter et al., 2017). Mayflower Wind will implement a reporting system to document dead or injured birds or bats found incidentally on vessels and offshore Project structures during construction, operation, and decommissioning. The location will be marked using GPS, an Incident Reporting Form will be filled out, and digital photographs will be taken. Any animals detected that could be ESA-listed will have their identity confirmed by consulting biologists, and a report will be submitted to the designated staff at Mayflower Wind who will then report it to BOEM, USFWS, and other relevant regulatory agencies. Carcasses with federal or research bands or tags will be reported to the U.S. Geological Survey (USGS) Bird Band Laboratory at https://www.pwrc.usgs.gov/bbl/.

7. Adaptive Monitoring

Over the course of monitoring, Mayflower Wind will work with BOEM, USFWS, MassWildlife, Rhode Island Department of Environmental Management (RIDEM), and other relevant regulatory agencies to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring based on an ongoing assessment of monitoring results. Potential triggers for adaptive monitoring may include, but are not limited to, equipment failure, an unexpected impact to birds or bats identified through monitoring, or new opportunities to collaborate with other projects in the region. The Monitoring Plan will include a series of potential adaptive monitoring actions, developed in coordination with BOEM, USFWS, and other relevant regulatory agencies.

8. Reporting

Mayflower Wind will submit an annual Monitoring Report to BOEM summarizing post-construction monitoring activities, preliminary results as available, and any proposed changes in the monitoring program. Mayflower Wind will consult with BOEM and USFWS, as necessary, to discuss the report and adaptive changes to the Monitoring Plan.

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