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Environmental Imaging Solutions

**Digital Aerial Wildlife Survey of BOEM Lease Area OCS-A 520**

**Monthly Report: November 2020**

**Equinor Wind US**

**APEM Ref: P00004197**

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## 1. Executive Summary

- A digital aerial wildlife survey of the Bureau of Ocean Energy Management (BOEM) Lease Area Outer Continental Shelf – Atlantic (OCS-A) 0520, off the Massachusetts coast was conducted on November 4<sup>th</sup>, 2020 using APEM Inc.'s high-resolution camera system to capture digital still imagery.
- Images collected have been analyzed by APEM Inc. (hereafter referred to as APEM) and quality assured by Normandeau Associates (hereafter referred to as Normandeau). Raw counts of all species and incidental observations recorded during the November 2020 survey are presented here.
- A total of 386 birds were recorded in the November 2020 survey area. The most abundant group recorded was gulls (n=209), followed by shearwaters (n=80); loons (n=30); gannets (n=21); shorebirds (n=13) and auks (n=13); waterfowl (n=11); fulmars (n=6); and storm petrels (n=1), cormorant / shags (n=1), and terns (n=1).
- A total of 165 birds (43%) were recorded in flight during the survey. These consisted of black-legged kittiwake (n=46), Bonaparte's gull (n=42), Manx shearwater (n=26), northern gannet (n=19), great shearwater (n=17), herring gull (n=6), red-throated loon (n=1), unidentified storm petrel species (n=1), northern fulmar (n=1), unidentified shearwater species (n=1), Sabine's gull (n=1), unidentified small gull species (n=1), great black-backed gull (n=1), Forster's tern (n=1), and murre / razorbill (n=1). There were 221 birds (57%) recorded as sitting.
- A total of 72 marine mammals were recorded, consisting of common dolphin (n=53), unidentified dolphin species (n=14), harbor porpoise (n=2), unidentified marine mammal species (n=2), and harbor seal (n=1).
- Three sharks, consisting of white shark (n=2), and unidentified shark species (n=1) were also recorded.
- No turtles, large bony fish, or rays were recorded.
- No Listed species were recorded (Federally or Massachusetts State Listed as Threatened or Endangered).

## 2. Introduction

APEM and Normandeau were contracted by Equinor Wind US to provide a full year of digital aerial wildlife surveys of the Massachusetts Lease Area OCS-A 0520. Surveys will be carried out on a monthly basis from December 2019 through November 2020, except for April, May, August, and September, when two surveys per month shall be carried out in order to coincide with potential use of the area by roseate tern (*Sterna dougallii*).

The aims and objectives of the work are to assess the abundance and distribution of birds, marine mammals, sharks, rays, and turtles present in the Lease Area OCS-A 0520 over the course of a full year. The surveys will provide the baseline information required for conducting impact assessments and are consistent with the survey guidelines for providing avian, marine mammal, and sea turtle information for renewable energy development on the OCS (BOEM 2017 and 2019).

The Survey Area referred to herein is comprised of the Lease Area OCS-A 0520, plus a 2 km (c. 1 NM) buffer surrounding it with an approximately 4 km (c. 2 NM) buffer towards the northeast end.

Images were captured using a grid-based survey design with a 1.5 cm ground sampling distance (GSD). Images were analyzed by APEM and quality assurance was undertaken by Normandeau. This report describes the results of the November 2020 survey.

## 3. Summary of Survey

The survey was undertaken on November 4<sup>th</sup>, 2020 from 17:15 to 19:15 (UTC). Data collected were 1.5 cm GSD digital still images using a GPS-linked bespoke flight management system to ensure the tracks were flown with a high degree of accuracy.

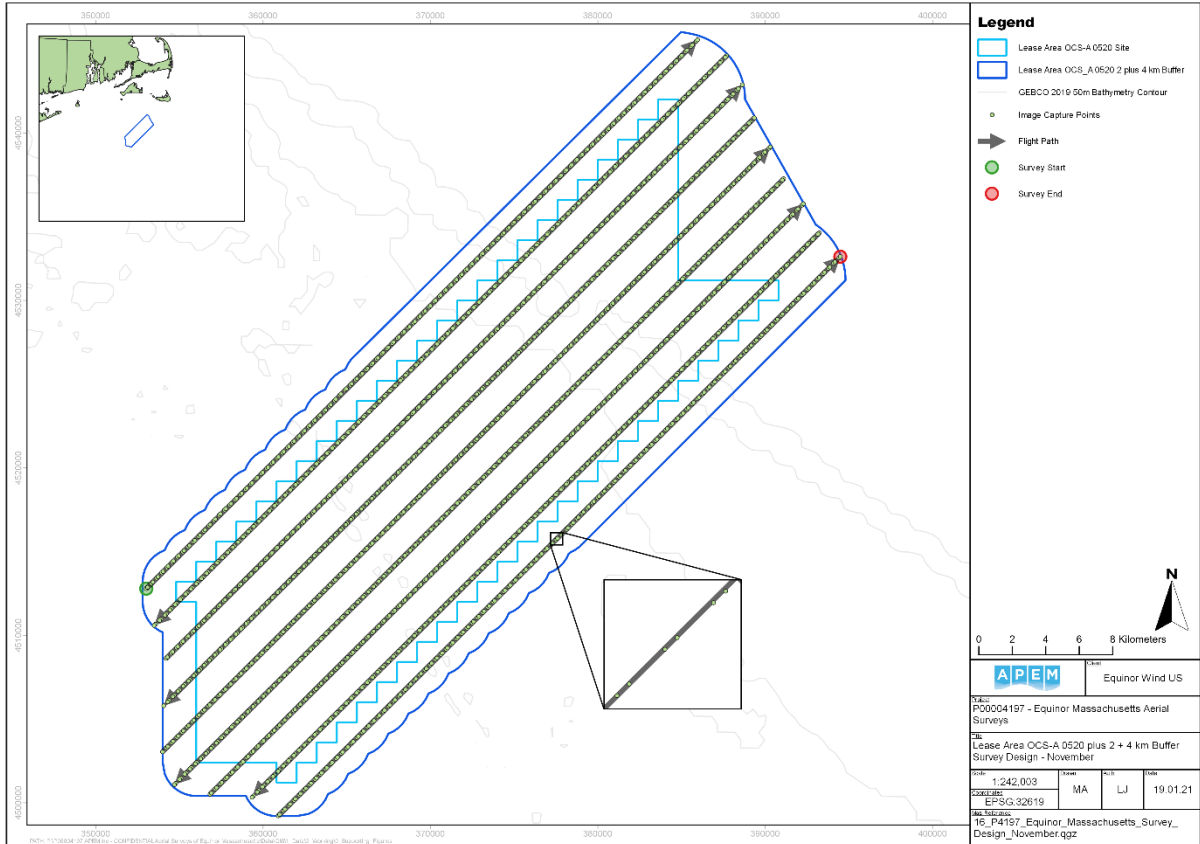
The digital aerial survey captured images along nine lines spaced approximately 1.9 km across-track and 0.5 km along-track between image nodes within the survey area (**Figure 1**). Coverage of images analyzed was calculated to be approximately 10% of the survey area.

On November 4<sup>th</sup>, 2020, the cloud cover was recorded as 0% (clear), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Wind speed was recorded as 10 knots from a southerly direction. The outside air temperature at the survey altitude was recorded as 46 to 52°F. The sea state was 2 (smooth), and the water turbidity was 1 (slightly turbid). The survey was conducted at an altitude of approximately 1,350 ft at a speed of approximately 120 knots.

No health and safety issues were reported during the survey.

APEM analyzed the images to enumerate birds to species level, and to enumerate any other non-avian marine fauna. Normandeau provided quality assurance (QA) of the data to check for missed animals in 10% of images recorded as empty, and quality assured 20% of the bird species identification undertaken by APEM (and 100% of Listed species). Normandeau also identified 100% of the species of non-avian marine fauna including marine mammals, turtles, sharks, and rays. Birds and marine fauna identified from the images were 'snagged' (i.e. located within the images) and categorized to species when possible, otherwise to the species grouping.

Data reported are raw counts of animals that have not yet been subject to extrapolation for population estimates. Design-based population estimates will be provided in the annual report.



**Figure 1** Survey design of Lease Area OCS-A 0520 plus 2 km / 4 km buffer

## 4. Abundance and Distribution

### 4.1 Species Abundance

The numbers of marine wildlife species recorded during the November 2020 survey are presented in **Table 1** and **Table 2**. Species scientific names are provided in Appendix I. Example individuals recorded during the surveys are provided in Appendix II.

**Table 1 Total number of individuals of birds recorded during the November 2020 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer**

Group	Species	Flying	Sitting	Total
Waterfowl	Surf Scoter	0	9	<b>9</b>
	White-winged Scoter	0	1	<b>1</b>
	Long-tailed Duck	0	1	<b>1</b>
Loon	Red-throated Loon	1	21	<b>22</b>
	Common Loon	0	8	<b>8</b>
Storm Petrel	Storm Petrel sp. – unidentified	1	0	<b>1</b>
Fulmar	Northern Fulmar	1	5	<b>6</b>
Shearwater	Great Shearwater	17	12	<b>29</b>
	Manx Shearwater	26	23	<b>49</b>
	Shearwater sp. – unidentified	1	1	<b>2</b>
Gannet	Northern Gannet	19	2	<b>21</b>
Cormorant / Shag	Cormorant sp. – unidentified	0	1	<b>1</b>
Shorebird	Red Phalarope	0	13	<b>13</b>
Gull	Black-legged Kittiwake	46	19	<b>65</b>
	Sabine's Gull	1	0	<b>1</b>
	Bonaparte's Gull	42	66	<b>108</b>
	Laughing Gull	0	1	<b>1</b>
	Small Gull sp. – unidentified	1	15	<b>16</b>
	Great Black-backed Gull	1	0	<b>1</b>
	Iceland Gull	0	2	<b>2</b>
	Herring Gull	6	4	<b>10</b>
	Large Gull sp. – unidentified	0	2	<b>2</b>
	Gull sp. – unidentified	0	3	<b>3</b>
Tern	Forster's Tern	1	0	<b>1</b>
Auk	Murre / Razorbill	1	11	<b>12</b>
	Auk sp. – unidentified	0	1	<b>1</b>
<b>Total Birds</b>		<b>165</b>	<b>221</b>	<b>386</b>

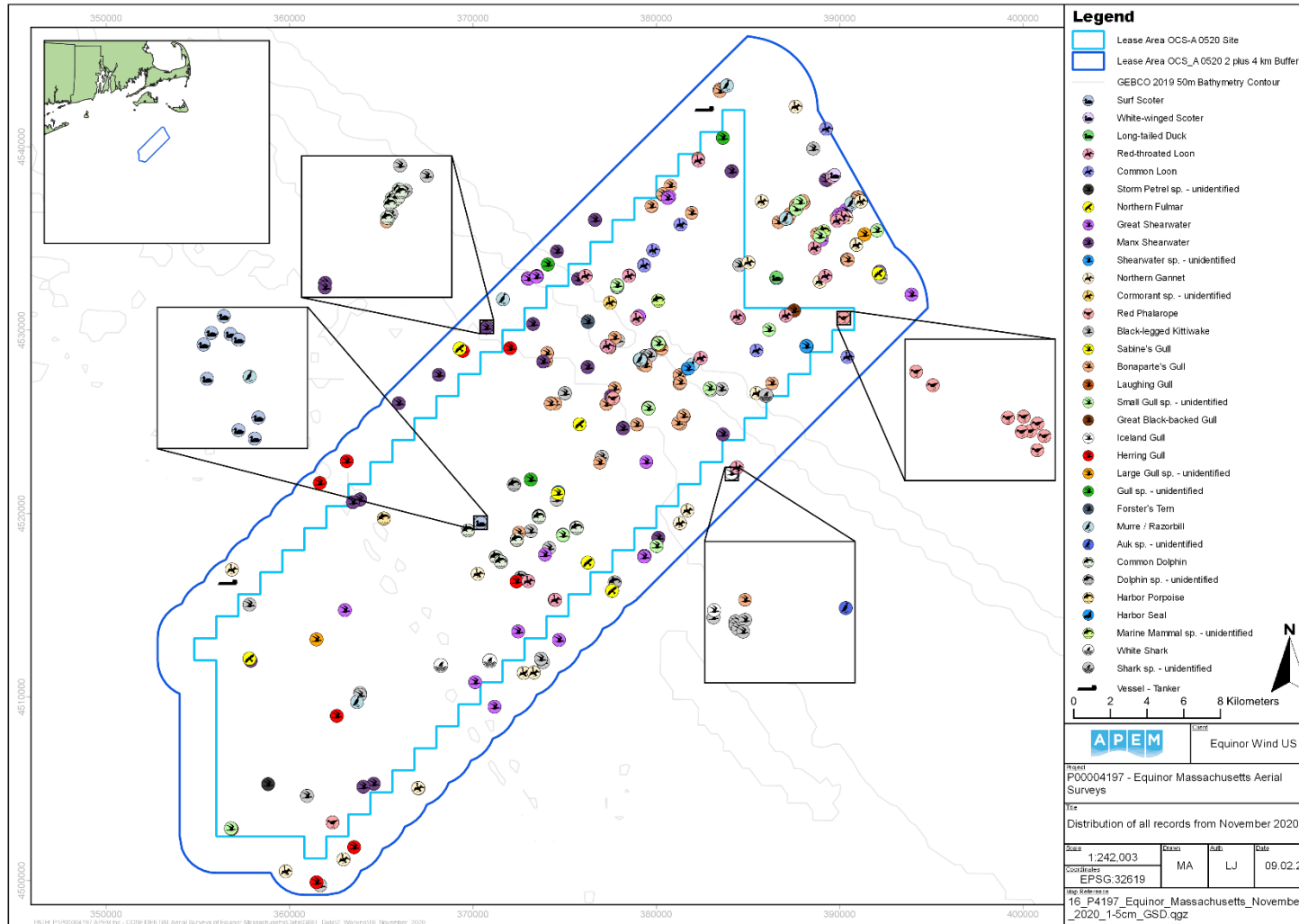


**Table 2 Total number of individuals of marine mammals and other fauna recorded during the November 2020 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer**

Group	Species	Submerged	Surfacing	Total
Marine Mammal	Common Dolphin	47	6	<b>53</b>
	Dolphin sp. – unidentified	14	0	<b>14</b>
	Harbor Porpoise	2	0	<b>2</b>
	Harbor Seal	0	1	<b>1</b>
	Marine Mammals sp. – unidentified	2	0	<b>2</b>
Shark	White Shark	2	0	<b>2</b>
	Shark sp. – unidentified	1	0	<b>1</b>
<b>Total</b>		<b>68</b>	<b>7</b>	<b><u>75</u></b>

## 4.2 Spatial Distribution

Figure 2 shows the location of all species recorded throughout the Survey Area.



**Figure 2** Distribution of all records from the November 2020 survey of Lease Area OCS-A 0520 plus 2 km / 4 km irregular buffer

Note: Individuals may appear to overlap if they are in close proximity to each other.

## 5. Shipping Observations

Two vessels, one identified as a fishing vessel, and one unidentified, were recorded visually from the aircraft during the November 4<sup>th</sup>, 2020 survey. Two vessels, both identified as tankers, were recorded in the imagery.

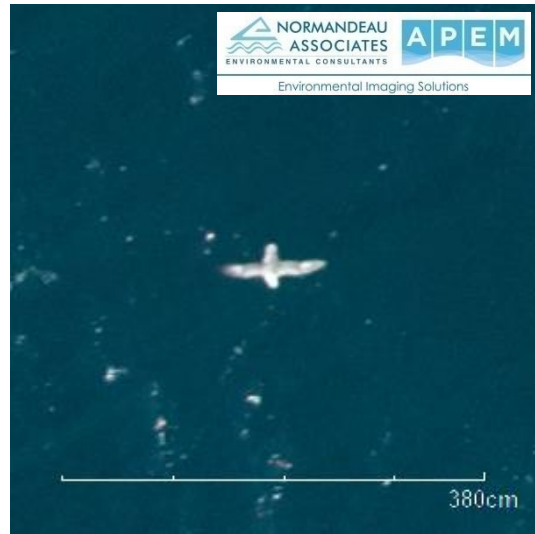
## Appendix I Species List

Common Name	Scientific Name	Family	Class
Surf Scoter	<i>Melanitta perspicillata</i>	Anatidae	Aves
White-winged Scoter	<i>Melanitta deglandi</i>	Anatidae	Aves
Long-tailed Duck	<i>Clangula hyemalis</i>	Anatidae	Aves
Red-throated Loon	<i>Gavia stellata</i>	Gaviidae	Aves
Common Loon	<i>Gavia immer</i>	Gaviidae	Aves
Northern Fulmar	<i>Fulmarus glacialis</i>	Procellariidae	Aves
Great Shearwater	<i>Ardenna gravis</i>	Procellariidae	Aves
Manx Shearwater	<i>Puffinus puffinus</i>	Procellariidae	Aves
Northern Gannet	<i>Morus bassanus</i>	Sulidae	Aves
Red Phalarope	<i>Phalaropus fulicarius</i>	Scolopacidae	Aves
Black-legged Kittiwake	<i>Rissa tridactyla</i>	Laridae	Aves
Sabine's Gull	<i>Xema sabini</i>	Laridae	Aves
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	Laridae	Aves
Laughing Gull	<i>Leucophaeus atricilla</i>	Laridae	Aves
Great Black-backed Gull	<i>Larus marinus</i>	Laridae	Aves
Iceland Gull	<i>Larus glaucoides</i>	Laridae	Aves
Herring Gull	<i>Larus smithsonianus</i>	Laridae	Aves
Forster's Tern	<i>Sterna forsteri</i>	Laridae	Aves
Thick-billed Murre	<i>Uria lomvia</i>	Alcidae	Aves
Common Murre	<i>Uria aalge</i>	Alcidae	Aves
Razorbill	<i>Alca torda</i>	Alcidae	Aves
Common Dolphin	<i>Delphinus delphis</i>	Delphinidae	Mammalia
Harbor Porpoise	<i>Phocoena phocoena</i>	Phocoenidae	Mammalia
Harbor Seal	<i>Phoca vitulina</i>	Phocidae	Mammalia
White Shark	<i>Carcharodon carcharias</i>	Lamnidae	Chondrichthyes

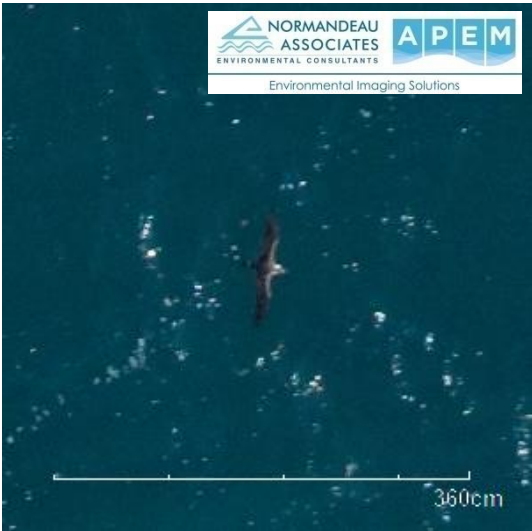
## Appendix II Example 'Snags' from the Survey



**a. Red-throated Loon**



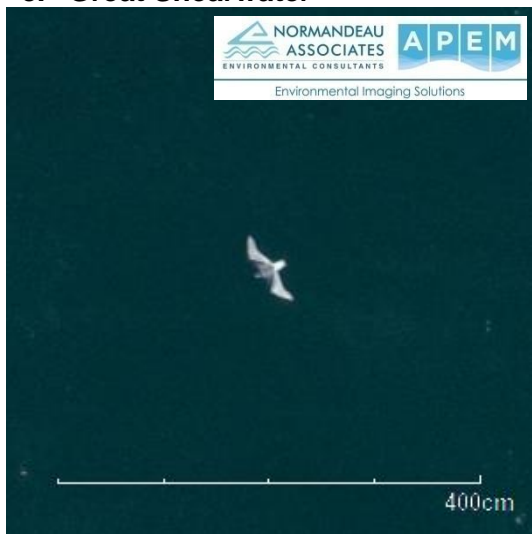
**b. Northern Fulmar**



**c. Great Shearwater**



**d. Manx Shearwater**



**e. Sabine's Gull**



**f. Iceland Gull**