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Environmental Imaging Solutions

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

**Monthly Report: December 2019**

**Equinor Wind US**

**APEM Ref: P00004197**

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1.1	03/18/2020	All	All	Amendments following internal review	LJ
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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 December 7<sup>th</sup>, 2019 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 December 2019 survey are presented here.
- A total of 147 birds were recorded in the December 2019 survey area. The most abundant group recorded was fulmars (n=35), followed by waterfowl (n=32); auks (n=28); gannets (n=28); gulls (n=13); and loons (n=11).
- A total of 64 birds (44%) were recorded in flight during the survey. These consisted of: northern fulmar (n=34); razorbill (n=9); black-legged kittiwake (n=6); northern gannet (n=5); great black-backed gull (n=4); herring gull (n=2); red-throated loon (n=2); and murre / razorbill (n=2). There were 83 birds (56%) recorded as sitting.
- A total of 51 marine mammals were recorded, consisting of: common dolphin (n=26); unidentified dolphin sp. (n=9); unidentified seal sp. (n=9); harbor porpoise (n=3); unidentified marine mammal sp. (n=3); and common / white-sided dolphin (n=1).
- No turtles, sharks, or rays were recorded during the December 2019 survey.
- No recorded species are Listed species (Federally or 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 December 2019 survey.

## 3. Summary of Survey

The survey was undertaken on December 7<sup>th</sup>, 2019 from 18:36 to 20:37 (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 the 7<sup>th</sup> December 2019, the cloud cover was recorded as 10-80% (few to mostly), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Wind speed was recorded as 10 knots from a westerly direction. The outside air temperature at the survey altitude was recorded as 29 to 31°F. The sea state was 2-3 (smooth to moderate) and the water turbidity was 2 (moderately 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, sharks, rays, and turtles. 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.

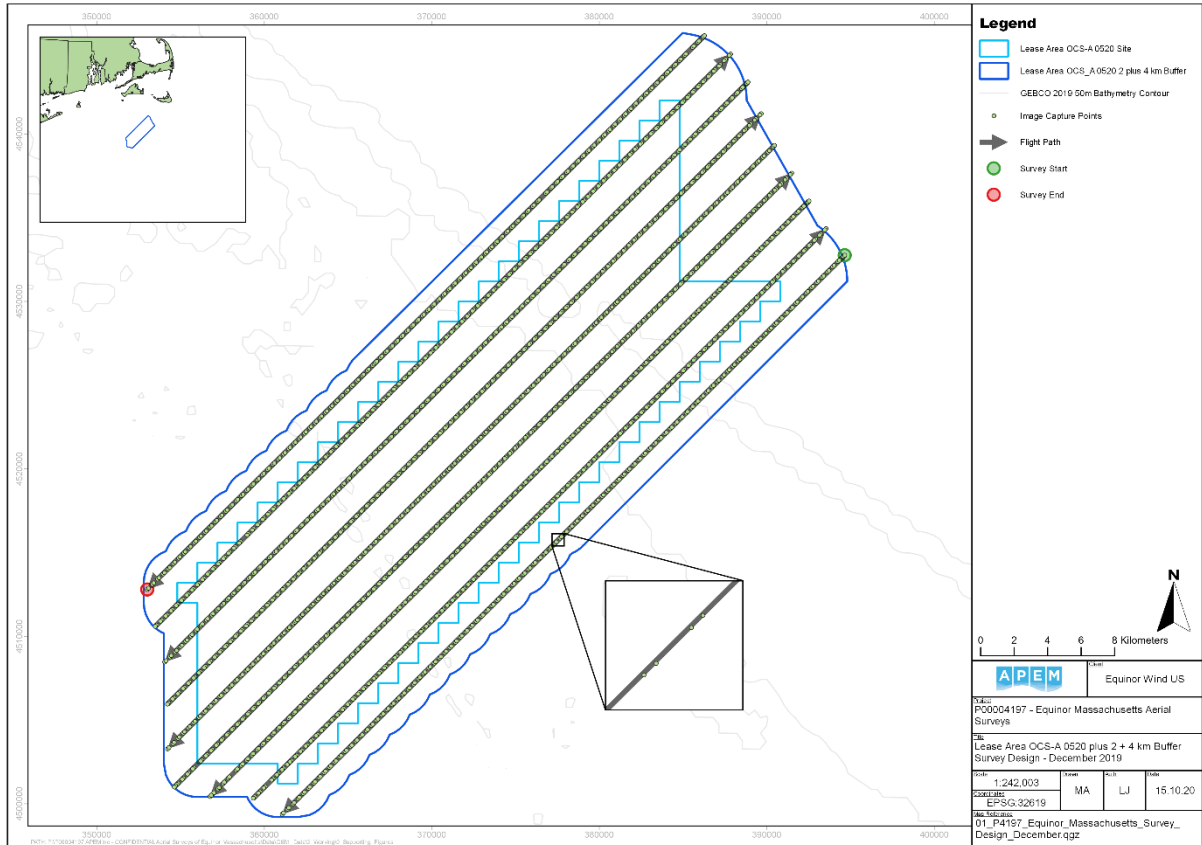


Figure 1 Survey design of Lease Area OCS-A 0520 plus 2 km / 4 km buffer

## 4. Abundance and Distribution

### 4.1 Species Abundance

The numbers of marine wildlife species recorded during the December 2019 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 December 2019 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer

Group	Species	Flying	Sitting	Total
Waterfowl	Scoter sp. – unidentified	0	32	<b>32</b>
Loon	Red-throated Loon	2	8	<b>10</b>
	Common Loon	0	1	<b>1</b>
Fulmar	Northern Fulmar	34	1	<b>35</b>
Gannet	Northern Gannet	5	23	<b>28</b>
Gull	Black-legged Kittiwake	6	0	<b>6</b>
	Small Gull sp. – unidentified	0	1	<b>1</b>
	Great Black-backed Gull	4	0	<b>4</b>
	Herring Gull	2	0	<b>2</b>
Auk	Common / Thick-billed Murre	0	1	<b>1</b>
	Razorbill	9	12	<b>21</b>
	Murre* / Razorbill	2	3	<b>5</b>
	Atlantic Puffin	0	1	<b>1</b>
<b>Total Birds</b>		<b>64</b>	<b>83</b>	<b>147</b>

\*Murre refers to either Common or Thick-billed Murre

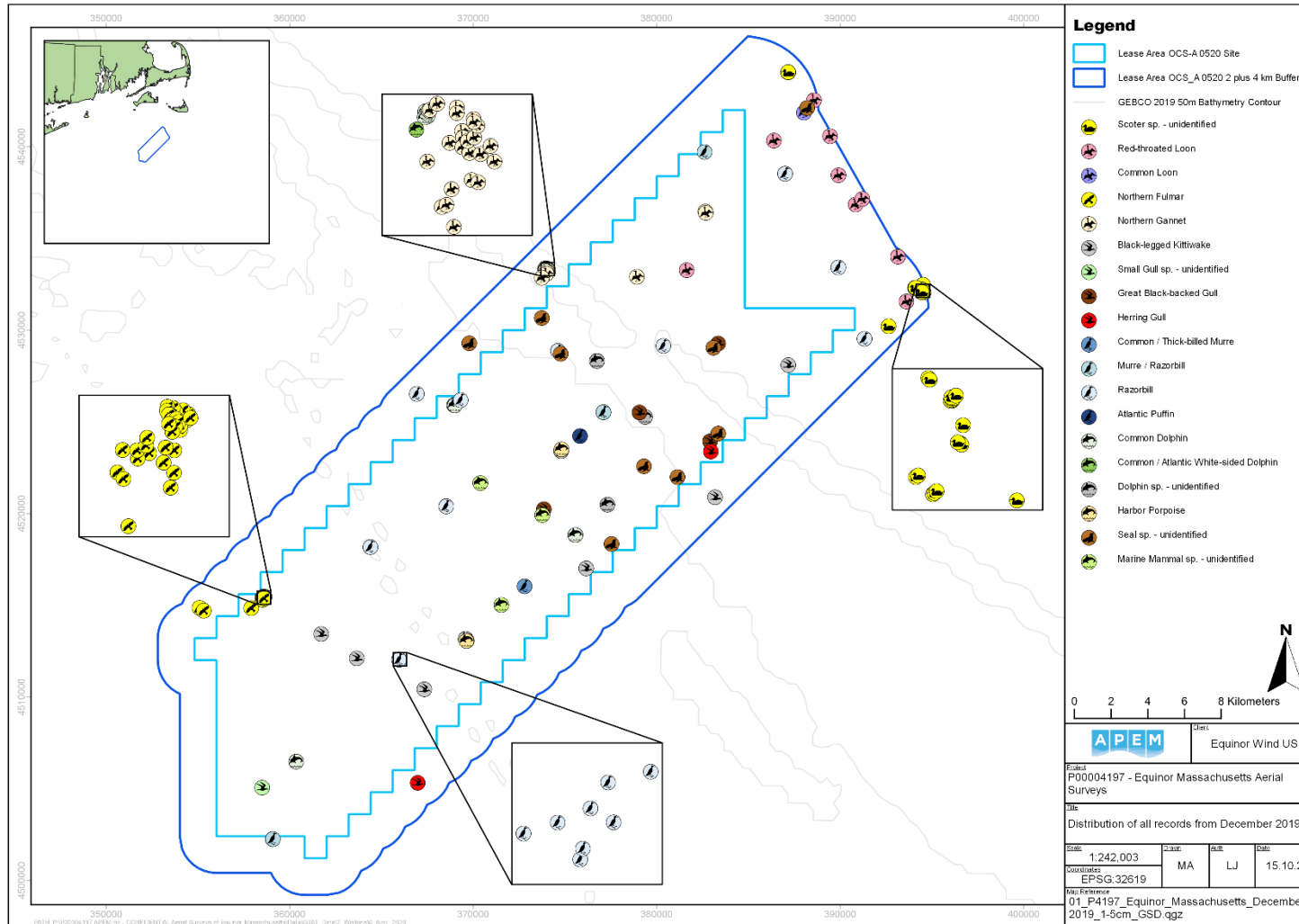
**Table 2** Total number of individuals of marine mammals and other fauna recorded during the December 2019 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer

Group	Species	Submerged	Surfacing	Total
Marine Mammal	Common Dolphin	24	2	<b>26</b>
	Common / Atlantic White-sided Dolphin	0	1	<b>1</b>
	Dolphin sp. – unidentified	9	0	<b>9</b>
	Harbor Porpoise	2	1	<b>3</b>
	Seal sp. – unidentified	2	7	<b>9</b>
	Marine Mammal sp. – unidentified	2	1	<b>3</b>
<b>Total</b>		<b>39</b>	<b>12</b>	<b>51</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 December 2019 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.

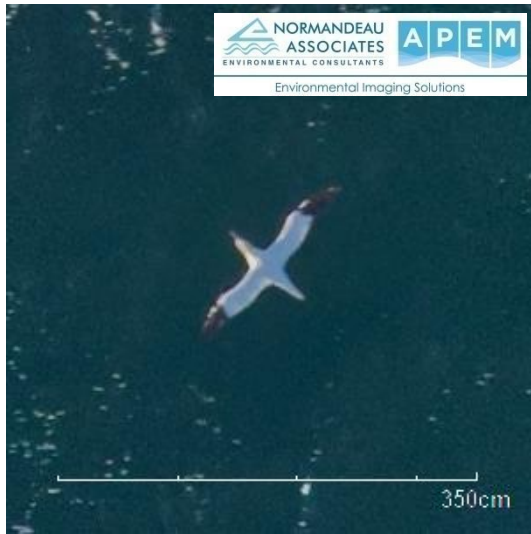
## 5. Shipping Observations

No vessels were recorded visually from the aircraft or in the imagery during the December 2019 survey.

## Appendix I Species List

Common Name	Scientific Name	Family	Class
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
Northern Gannet	<i>Morus bassanus</i>	Sulidae	Aves
Black-legged Kittiwake	<i>Rissa tridactyla</i>	Laridae	Aves
Great Black-backed Gull	<i>Larus marinus</i>	Laridae	Aves
Herring Gull	<i>Larus smithsonianus</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
Atlantic Puffin	<i>Fratercula arctica</i>	Alcidae	Aves
Common Dolphin	<i>Delphinus delphis</i>	Delphinidae	Mammalia
Atlantic White-sided Dolphin	<i>Lagenorhynchus acutus</i>	Delphinidae	Mammalia
Harbor Porpoise	<i>Phocoena phocoena</i>	Phocoenidae	Mammalia

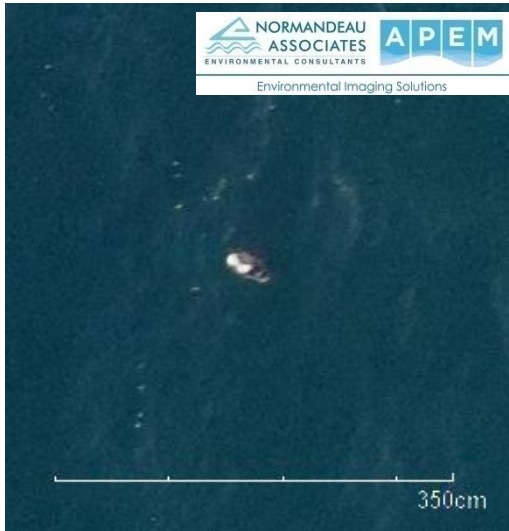
## Appendix II Example 'Snags' from the Survey



**a. Northern Gannet**



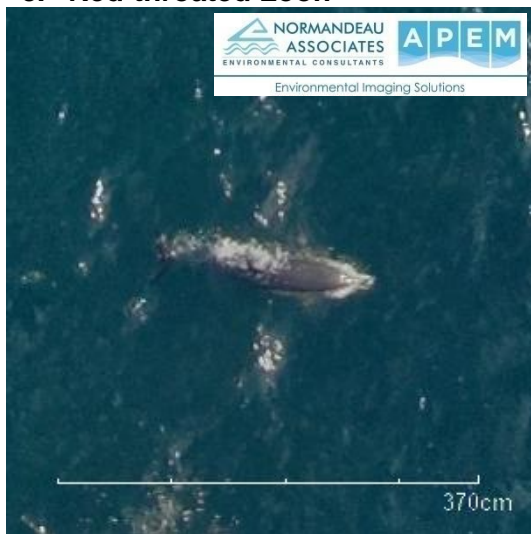
**b. Great Black-backed Gull**



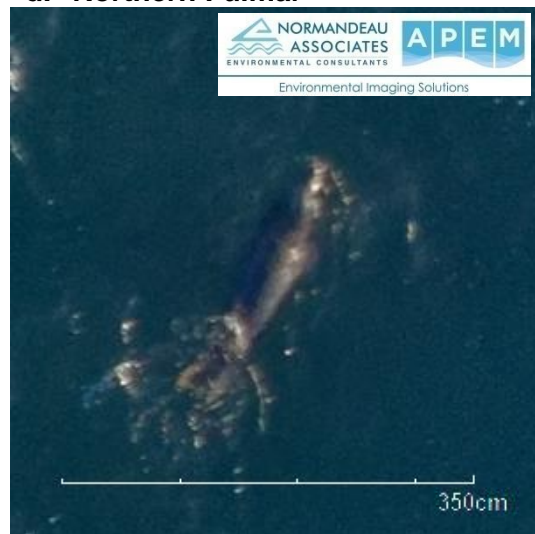
**c. Red-throated Loon**



**d. Northern Fulmar**



**e. Common Dolphin**



**f. Seal sp. – unidentified**