



Environmental Imaging Solutions

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

Monthly Report: September Surveys I & II 2020

Equinor Wind US

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1. Executive Summary

- Two digital aerial wildlife surveys of the Bureau of Ocean Energy Management (BOEM) Lease Area Outer Continental Shelf – Atlantic (OCS-A) 0520, off the Massachusetts coast were conducted on September 14th and September 24th, 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 September 2020 surveys are presented here.
- A total of 157 birds were recorded in the survey area during the first September survey. The most abundant group recorded was shearwaters (n=150), followed by gulls (n=6), and jaegers (n=1).
 - A total of 46 birds (29%) were recorded in flight during the survey. These consisted of Cory's shearwater (n=37), great shearwater (n=7), great black-backed gull (n=1), and parasitic jaeger (n=1). There were 111 birds (71%) recorded as sitting.
 - A total of three large bony fish consisting of ocean sunfish (n=3) were recorded.
 - A total of four sharks consisting of dusky shark (n=1), unidentified Carcharhinidae shark species (n=1), white shark (n=1), and unidentified shark species (n=1) were recorded.
 - No marine mammals, turtles, or rays were recorded.
- A total of 86 birds were recorded in the survey area during the second September survey. The most abundant group recorded was gulls (n=76), followed by shearwaters (n=4), fulmars (n=4), and gannets (n=1) and passerines (n=1).
 - A total of 12 birds (14%) were recorded in flight during the survey. These consisted of herring gull (n=5), Cory's shearwater (n=3), northern fulmar (n=2), great black-backed gull (n=1), and unidentified passerine species (n=1). There were 74 birds (86%) recorded as sitting.
 - One large bony fish consisting of unidentified sunfish species (n=1) was recorded.
 - A total of six sharks consisting of basking shark (n=2), dusky shark (n=1), blue shark (n=1), white shark (n=1), and unidentified shark species (n=1) were recorded.
 - No marine mammals, turtles, or rays were recorded.
- Basking shark and dusky shark are Listed species (Federally Listed as Threatened or Endangered, 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 first and second September 2020 surveys.

3. Summary of Survey

The first September survey was undertaken on September 14th, 2020 from 17:44 to 19:39 (UTC), and the second September survey was undertaken on September 24th, 2020 from 14:40 to 16:35 (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.

Prior to the first September survey, an additional survey was flown in September as a part of the 'August' survey block. This was due to adverse weather conditions delaying the final August survey and as a result it was flown at the earliest possible opportunity thereafter. For the purposes of these reports, the delayed survey was considered as part of the August surveys and so has been described in the previous report.

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** and **Figure 2**). Coverage of images analyzed was calculated to be approximately 10% of the survey area.

On September 14th, 2020, the cloud cover was recorded as 100% (overcast), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Wind speed was recorded as 29 knots from a northerly direction. The outside air temperature at the survey altitude was recorded as 68°F. The sea state was 2 (smooth), and the water turbidity was 1 (slightly turbid). On September 24th, 2020, the cloud cover was recorded as 80% (broken), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Wind speed was recorded as 10 knots from a northwesterly direction. The outside temperature at the survey altitude was recorded as 68-70°F. The sea state was 1 (calm / rippled), and the water turbidity was 0 (clear). Both surveys were conducted at an altitude of approximately 1,360 ft at a speed of approximately 150 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.

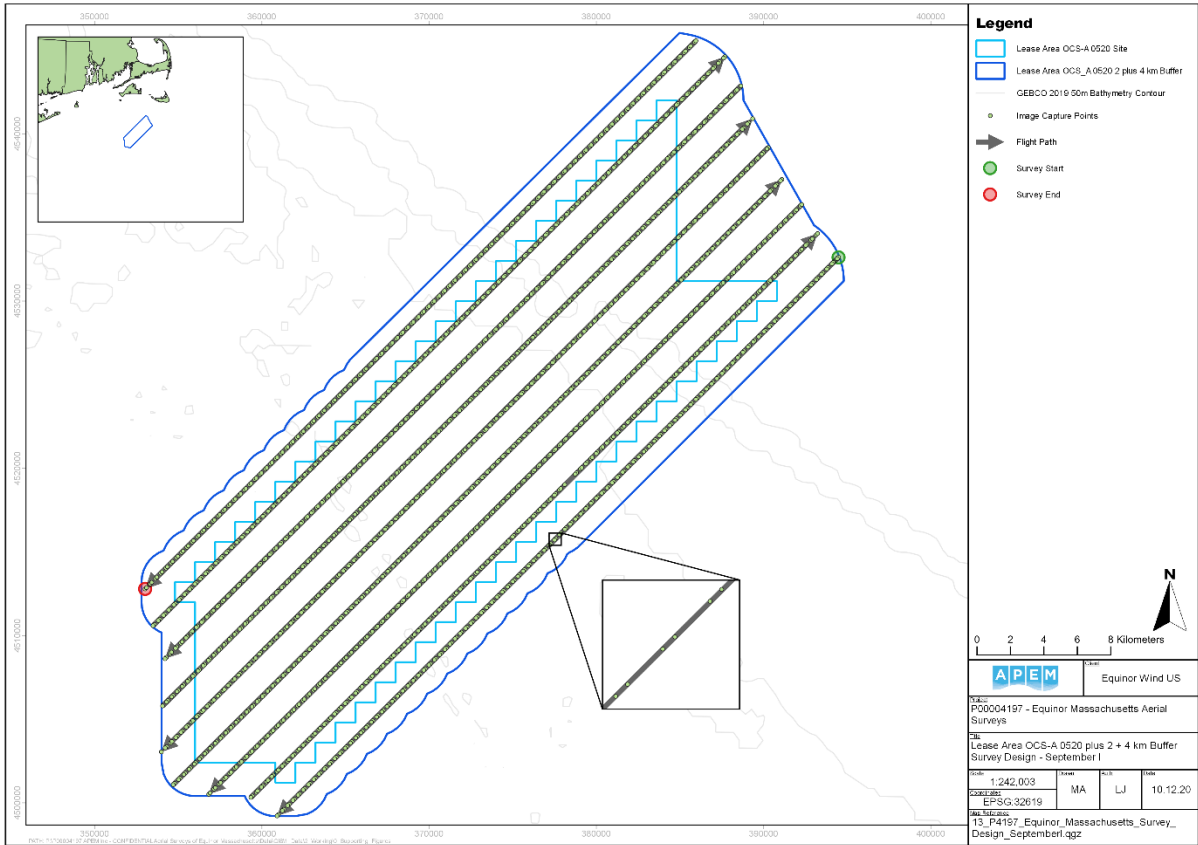


Figure 1 September I Survey Design of Lease Area OCS-A 0520 plus 2 km / 4 km buffer

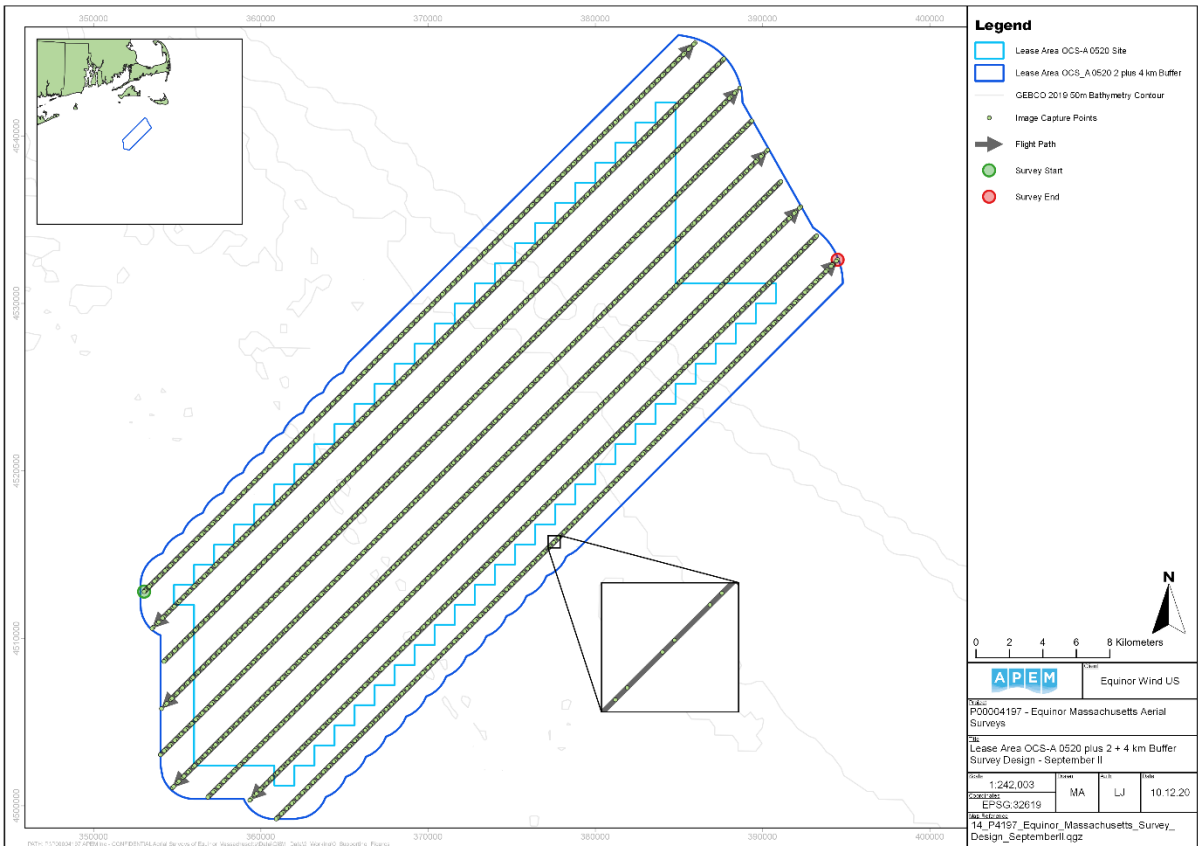


Figure 2 September II Survey Design of Lease Area OCS-A 0520 plus 2 km / 4 km buffer

4. Abundance and Distribution

4.1 Species Abundance

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

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

Group	Species	Flying	Sitting	Total
Shearwater	Cory's Shearwater	37	52	89
	Great Shearwater	7	1	8
	Large Shearwater sp. – unidentified	0	53	53
Gull	Great Black-backed Gull	1	0	1
	Herring Gull	0	4	4
	Gull sp. – unidentified	0	1	1
Jaegers	Parasitic Jaeger	1	0	1
Total Birds		46	111	<u>157</u>

Table 2 Total number of individuals of other fauna recorded during the September I 2020 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer

Group	Species	Submerged	Surfacing	Total
Large Bony Fish	Ocean Sunfish	3	0	3
Shark	Dusky Shark	1	0	1
	Carcharhinidae Shark sp. – unidentified	1	0	1
	White Shark	1	0	1
	Shark sp. – unidentified	1	0	1
Total		7	0	<u>7</u>

Table 3 Total number of individuals of birds recorded during the September II 2020 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer

Group	Species	Flying	Sitting	Total
Fulmar	Northern Fulmar	2	2	4
Shearwater	Cory's Shearwater	3	1	4
Gannet	Northern Gannet	0	1	1
Gull	Great Black-backed Gull	1	11	12
	Herring Gull	5	55	60
	Lesser Black-backed Gull	0	3	3
	Gull sp. – unidentified	0	1	1
Passerine	Passerine sp. – unidentified	1	0	1
Total Birds		12	74	<u>86</u>

Table 4 Total number of individuals of other fauna recorded during the September II 2020 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer

Group	Species	Submerged	Surfacing	Total
Large Bony Fish	Sunfish sp. – unidentified	1	0	1
Shark	Dusky Shark	1	0	1
	Blue Shark	1	0	1
	Basking Shark	2	0	2
	White Shark	1	0	1
	Shark sp. – unidentified	1	0	1
Total		7	0	7

4.2 Spatial Distribution

Figure 3 and Figure 4 show the location of all species recorded throughout the Survey Area during the September surveys.

Figure 5 and Figure 6 show the location and direction of travel for recorded Listed species (Federally Listed as Threatened or Endangered, Massachusetts State Listed as Endangered) from the September 2020 surveys. All recorded Listed species were travelling eastwards.

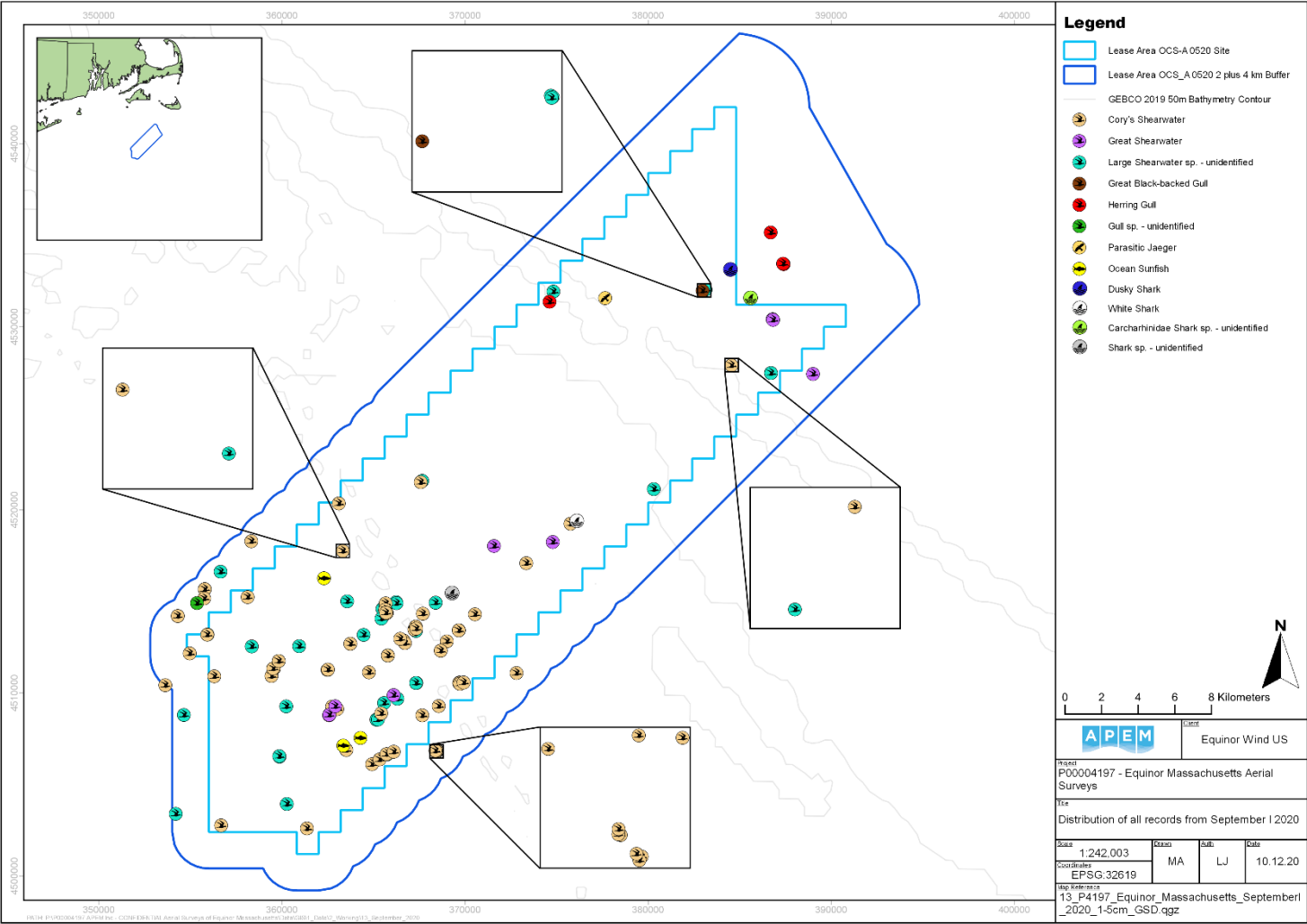


Figure 3 Distribution of all records from the September 1 2020 survey of Lease Area OCS-A 0520 plus 2 km / 4 km irregular buffer

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

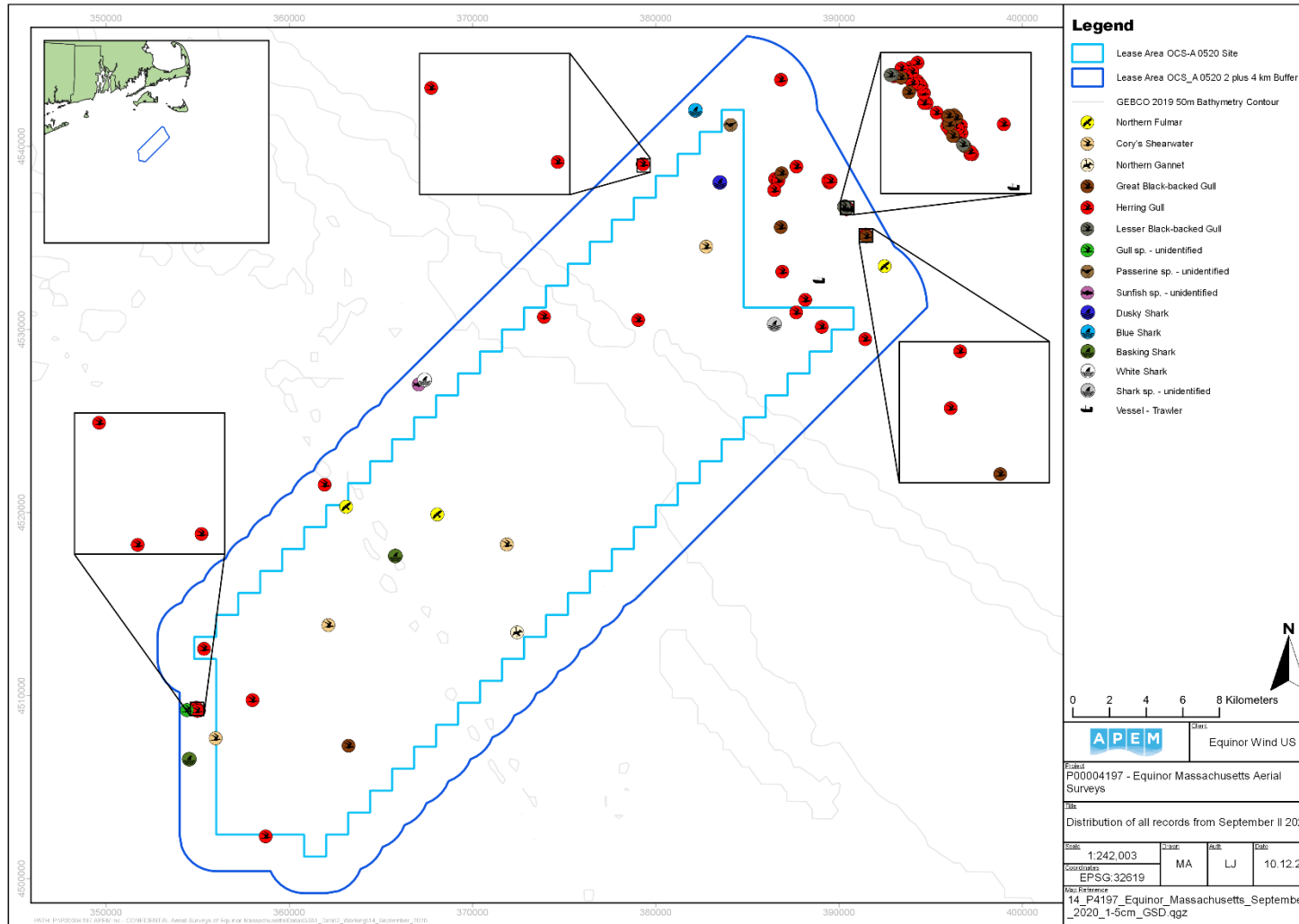


Figure 4 Distribution of all records from the September II 2020 survey of Lease Area OCS-A 0520 plus 2 km / 4 km irregular buffer

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

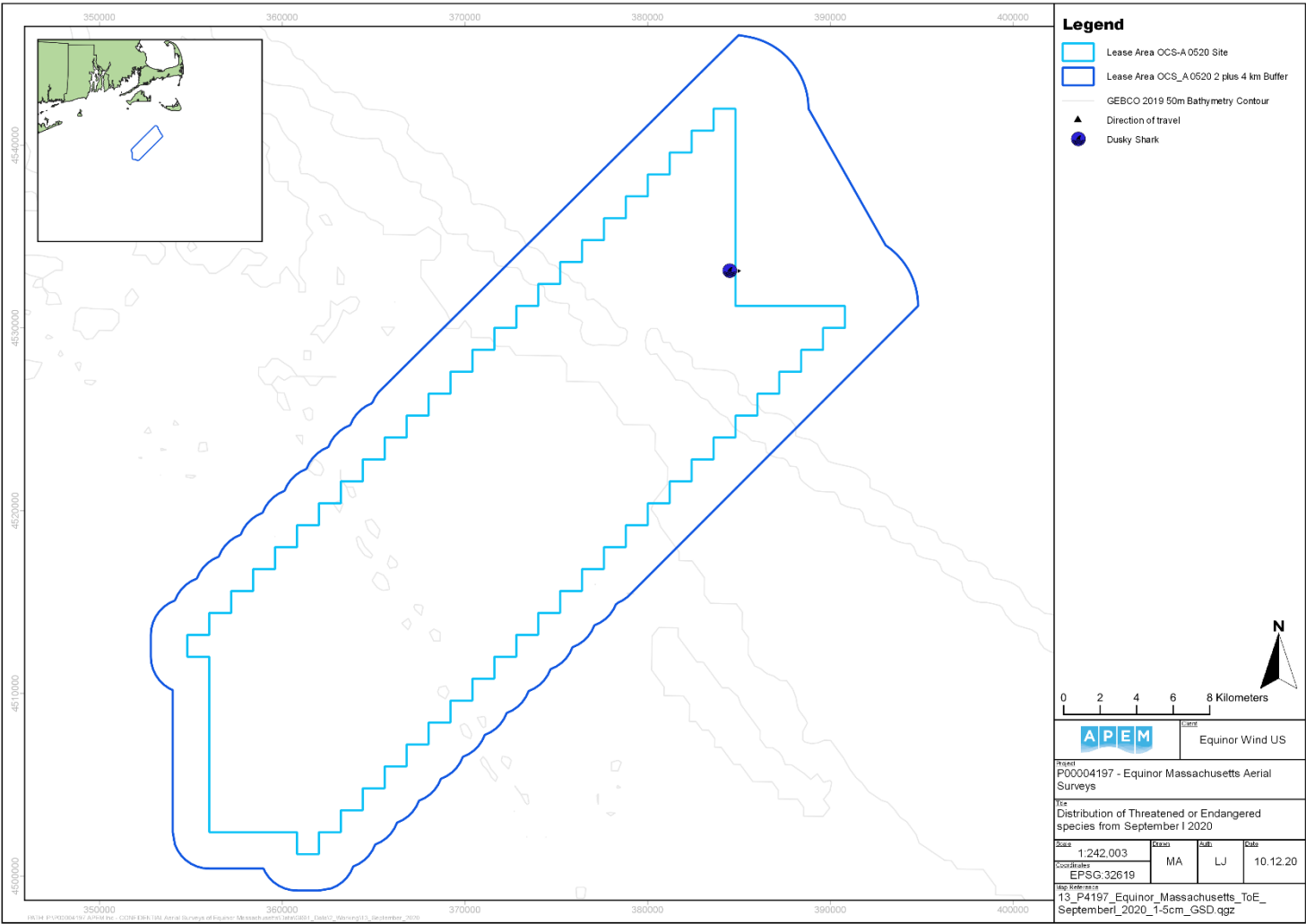


Figure 5 Distribution of Threatened or Endangered species from the September 1 2020 survey of Lease Area OCS-A 0520 plus 2 km / 4 km irregular buffer

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

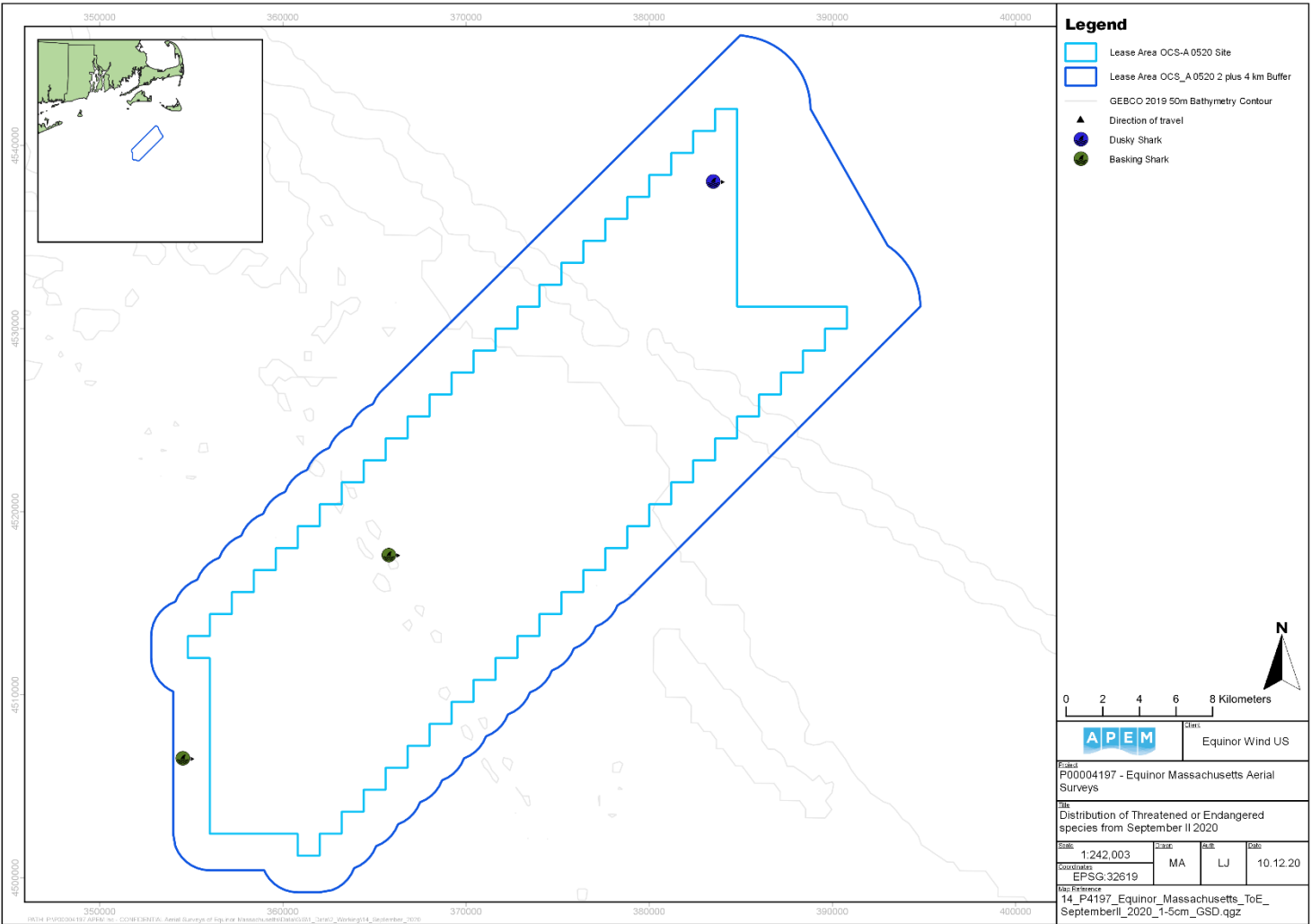


Figure 6 Distribution of Threatened or Endangered species from the September II 2020 survey of Lease Area OCS-A 0520 plus 2 km / 4 km irregular buffer

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

5. Shipping Observations

A single vessel, identified as a supply vessel, was recorded visually from the aircraft during the September 14th, 2020 survey. No vessels were recorded in the imagery.

A single vessel, identified as a fishing vessel, was recorded visually from the aircraft during the September 24th, 2020 survey. Two vessels, both identified as trawlers, were recorded within the imagery.

Appendix I Species List

Common Name	Scientific Name	Family	Class
Northern Fulmar	<i>Fulmarus glacialis</i>	Procellariidae	Aves
Cory's Shearwater	<i>Calonectris borealis</i>	Procellariidae	Aves
Great Shearwater	<i>Ardenna gravis</i>	Procellariidae	Aves
Northern Gannet	<i>Morus bassanus</i>	Sulidae	Aves
Great Black-backed Gull	<i>Larus marinus</i>	Laridae	Aves
Herring Gull	<i>Larus smithsonianus</i>	Laridae	Aves
Lesser Black-backed Gull	<i>Larus fuscus</i>	Laridae	Aves
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Stercoraridae	Aves
Ocean Sunfish	<i>Mola mola</i>	Molidae	Actinopterygii
Dusky Shark	<i>Carcharhinus obscurus</i>	Carcharhinidae	Chondrichthyes
Blue Shark	<i>Prionace glauca</i>	Carcharhinidae	Chondrichthyes
Basking Shark	<i>Cetorhinus maximus</i>	Cetorhinidae	Chondrichthyes
White Shark	<i>Carcharodon carcharias</i>	Lamnidae	Chondrichthyes

Appendix II Example 'Snags' from the Survey



a. Cory's Shearwater



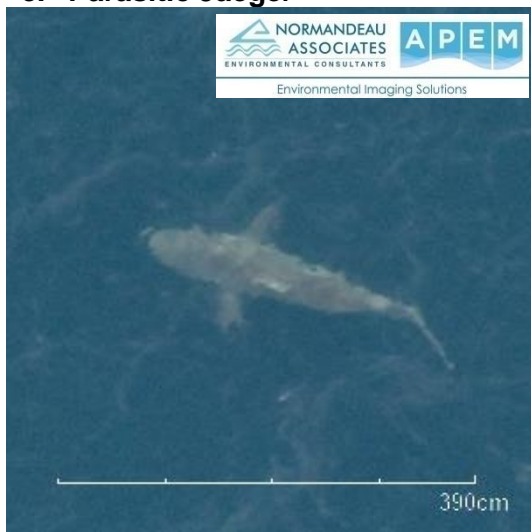
b. Great Black-backed Gull



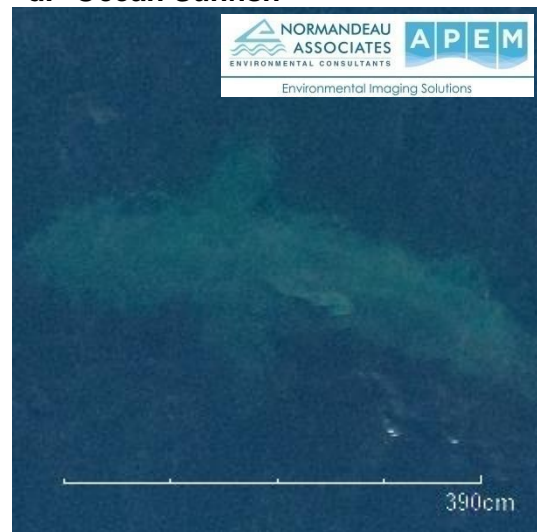
c. Parasitic Jaeger



d. Ocean Sunfish



e. Dusky Shark



f. Basking Shark