
Environmental Imaging Solutions

**Ornithological and Marine Fauna Aerial Survey of Lease Area OCS-
A 0512**

Monthly Report: September 2018

Equinor

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1. Executive Summary

- An aerial survey of Equinor's Lease Area OCS-A 0512 lease area and a 4 km (2.5 miles) buffer in the New York Bight was conducted on the 27th and 29th of September 2018 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 2018 survey are presented here.
- A total of 55 marine animals (47 birds, three turtles, three rays, one large bony fish, and one marine mammal) were recorded in the Survey Area in September 2018. The most abundant species group recorded was gulls (n=26), followed by shearwaters (n=21), turtles (n=3) rays (n=3), large bony fish (n=1), and marine mammals (n=1).
- A total of 33 birds (70%) were recorded in flight during this survey. These consisted of Cory's shearwater (n=13), herring gull (n=10), great black-backed gull (n=5), large shearwater species (n=3), great shearwater (n=1), and ring-billed gull (n=1). There were 14 birds recorded as sitting (30%).
- Loggerhead sea turtle (n=3) was recorded. This species is considered a Listed Species (Federally listed as Threatened or Endangered, New York State listed as Threatened).

2. Introduction

APEM and Normandeau were contracted by Equinor to provide monthly aerial digital survey data of the Lease Area OCS-A 0512 from November 2017 until October 2018.

The aims and objectives of the work required by Equinor were to assess the abundance and distribution of primarily birds present in the Lease Area OCS-A 0512, and also to gather information on other marine fauna such as marine mammals, sharks, rays, and turtles. These surveys will provide the baseline information required for conducting impact assessments and will meet the U.S. Bureau of Ocean Energy Management's (BOEM's) regulatory requirements for environmental review of Wind Energy Areas.

The Survey Area referred to herein comprise of the Lease Area OCS-A 0512 (its proposed turbine array footprint) plus a 4 km (2.5 mile) buffer surrounding it. The Survey Area data in this report represent the total number of birds, other marine fauna, and incidental occurrences recorded across all images (including those that may fall outside the proposed Lease Area OCS-A 0512 plus buffer region).

To meet the objectives of the project, 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 September 2018 survey.

3. Summary of Survey

The survey was undertaken on the 27th and 29th of September 2018. 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 aerial digital survey captured images along 28 lines spaced approximately 0.8 km across-track and 0.6 km along-track between image nodes within the Lease Area OCS-A 0512 plus 4 km buffer. Coverage was calculated to be approximately 10% generated from 1,550 image capture points.

On the 27th of September 2018, the cloud cover was recorded as 40 to 100% (scattered-overcast), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Winds of 10-22 knots blew initially from the south west and later from an easterly direction. The outside air temperature at the survey altitude was recorded as 61 to 64°F. The sea state was 1 to 3 (calm-moderate) and the water turbidity was 1 (slightly turbid).

On the 29th of September 2018, the cloud cover was recorded as 0 to 5% (clear-few), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Winds of 15-20 knots blew from a north-westerly direction. The outside air temperature at the survey altitude was recorded as 64 to 65°F. The sea state was 2 to 3 (smooth-moderate) and the water turbidity was 1 (slightly turbid).

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 of the data to check for missed animals in 10% of images recorded as empty and also quality assured 20% of the bird species identification undertaken by APEM (and 100% of Listed species). Normandeau identify 100% of the species of non-avian marine fauna including marine mammals, sharks, rays, turtles. Birds and marine fauna identified from the images were 'snagged' (i.e. located within the images) and categorised usually to species, but sometimes 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 following the completion of the October 2018 survey.

4. Abundance and Distribution

4.1 Species Abundance

A total of 47 birds (Table 1), three turtles, three rays, one marine mammal, and one bony fish species (Table 2) were recorded in the Survey Area in September 2018. The most abundant group recorded was gulls (n=26), followed by shearwaters (n=21), turtles (n=3), rays (n=3), marine mammals (n=1), and bony fish species (n=1).

One Threatened¹ species, comprised of the loggerhead sea turtle (n=3), was recorded during the survey.

Table 1 Total number of individuals of the bird species (in taxonomic order) recorded during the September 2018 survey of the Lease Area OCS-A 0512 plus 4 km buffer.

Group	Species	Flying	Sitting	Total
Shearwater	Cory's Shearwater	13	1	14
	Great Shearwater	1	-	1
	Species unknown - large	3	3	6
Gull	Ring-billed Gull	1	-	1
	Herring Gull	10	2	12
	Great Black-backed Gull	5	8	13
Total Birds		33	14	47

Table 2 Total number of individuals of the non-avian species (in taxonomic order) recorded during the September 2018 survey of the Lease Area OCS-A 0512 plus 4 km buffer.

Group	Species	Surfacing	Submerged	Total
Marine Mammal	Common Minke Whale	-	1	1
Total Mammals		0	1	1
Group	Species	Surfacing	Submerged	Total
Turtle	Loggerhead Sea Turtle	2	1	3
Total Turtles		2	1	3
Group	Species	Surfacing	Submerged	Total
Rays	Cownose Ray	-	3	3
Total Rays		0	3	3
Group	Species	Surfacing	Submerged	Total
Large Bony Fish	Ocean Sunfish	-	1	1
Total Large Bony Fish		0	1	1

¹ Federally listed as Threatened or Endangered, New York State listed as Endangered.

4.2 Spatial Distribution

Figure 1 shows the location of birds recorded throughout the Survey Area. One marine mammal species; one turtle species; one large bony fish species; and one ray species were also recorded.

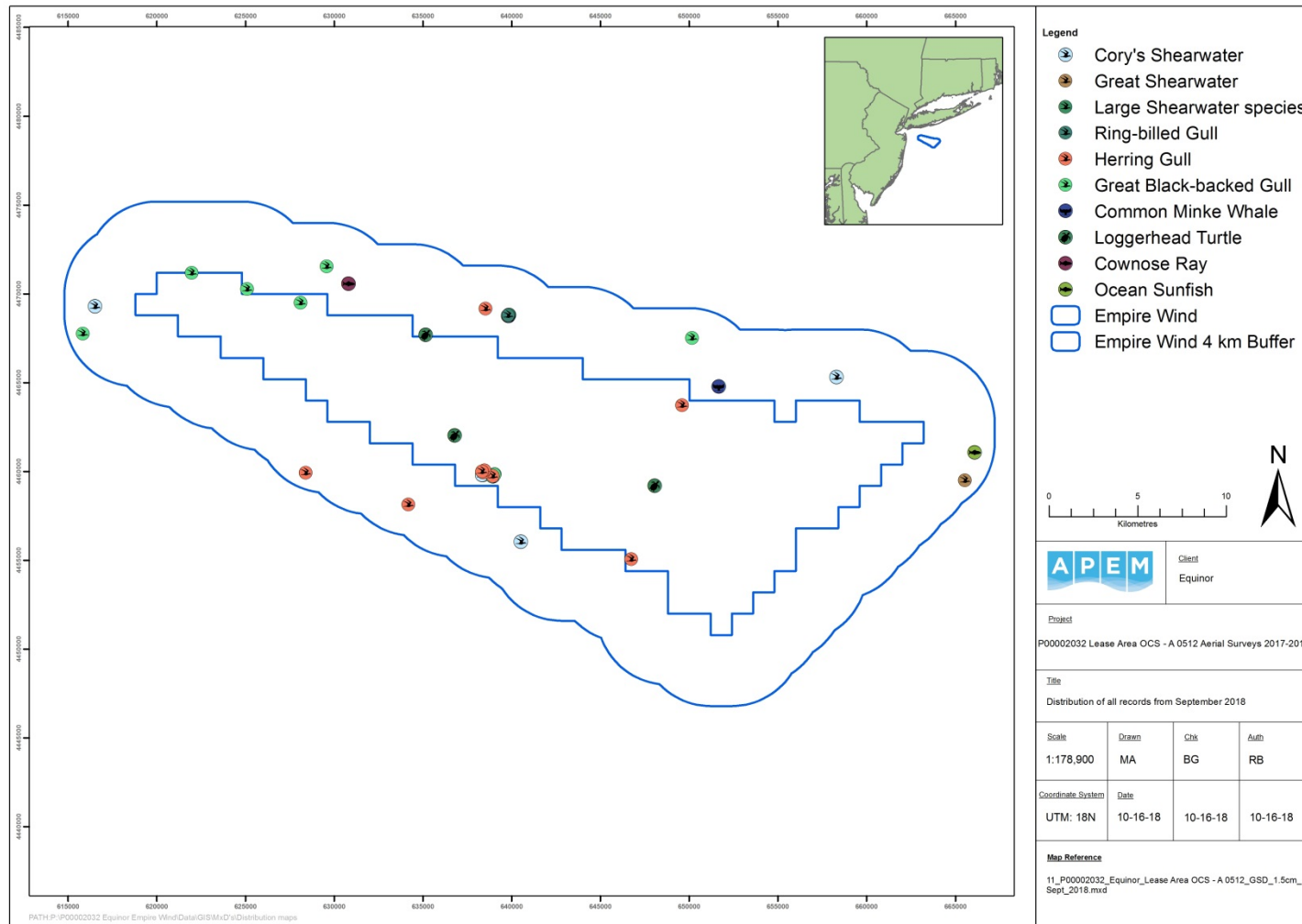


Figure 1 Distribution of all records from the September 2018 survey of Lease Area OCS-A 0512 plus 4 km (2.5 mile) buffer.

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

5. Shipping Observations

Two vessels were visually observed from the aircraft on the 27th September 2018. These were both recorded as fishing vessels and both had a northerly bearing.

Three vessels were observed visually from the aircraft on the 29th September 2018. The first was classified as a fishing vessel with a north-easterly bearing. The remaining two were classified as small speedboats with a south-easterly bearing.

6. General Conclusions

A total of 47 birds were recorded in the Survey Area in September 2018. The most abundant group recorded was gulls (n=26), followed by shearwaters (n=21).

A total of 33 birds (70%) were recorded in flight during this survey. These consisted of Cory's shearwater (n=13), herring gull (n=10), great black-backed gull (n=5), large shearwater species (n=3), great shearwater (n=1), and ring-billed gull (n=1). There were 14 birds recorded as sitting (30%).

A total of three turtles were recorded, consisting of one species; the loggerhead sea turtle (n=3). This species is considered a Listed Species (Federally listed as Threatened or Endangered, New York State listed as Threatened).

Three cownose rays, one minke whale, and one ocean sunfish were also recorded in September 2018.

Appendix I Species List in Taxonomic Order

Common Name	Scientific Name	Family	Class
Cory's Shearwater	<i>Calonectris borealis</i>	Procellariidae	Aves
Great Shearwater	<i>Ardenna gravis</i>	Procellariidae	Aves
Ring-billed Gull	<i>Larus delawarensis</i>	Laridae	Aves
Herring Gull	<i>Larus argentatus</i>	Laridae	Aves
Great Black-backed Gull	<i>Larus marinus</i>	Laridae	Aves
Common Minke Whale	<i>Balaenoptera acutorostrata</i>	Balaenopteridae	Mammalia
Loggerhead Sea Turtle	<i>Caretta caretta</i>	Cheloniidae	Reptilia
Cownose Ray	<i>Rhinoptera bonasus</i>	Rhinopteridae	Chondrichthyes
Ocean Sunfish	<i>Mola mola</i>	Molidae	Actinopterygii