
Environmental Imaging Solutions

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

Monthly Report: August 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 16th and the 17th of August 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 August 2018 survey are presented here.
- A total of 20 birds were recorded in the Survey Area in August 2018. The most abundant group recorded was shearwaters (n=16), followed by petrels (n=2), herons (n=1) and gulls (n=1).
- A total of 16 birds (80%) were recorded in flight during this survey. These consisted of Cory's shearwater (n=11), great shearwater (n=1), black-capped petrel (n=1), great blue heron (n=1), great black-backed gull (n=1) and petrel species (n=1). There were 4 birds recorded as sitting (20%).
- A total of 13 turtles were recorded, consisting of five loggerhead turtle, four Kemp's ridley turtles, three loggerhead / Kemp's ridley turtles and one unidentified turtle species. These turtle species are listed as Endangered (Federally listed as Threatened or Endangered, and New York State listed as Endangered).
- A total of 502 cownose rays and four unidentified shark species were also recorded in August 2018.

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 August 2018 survey.

3. Summary of Survey

The survey was undertaken on the 16th and the 17th of August 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 16th of August 2018, the cloud cover was recorded as 40 to 60% (scattered to broken), visibility was greater than 6 km (3.7 miles), and no precipitation was recorded. Winds of 16-21 knots blew from a southerly direction. The outside air temperature at the survey altitude was recorded as 82 to 83°F. The sea state was 2 (smooth) and the water turbidity was 1 (slightly turbid).

On the 17th of August 2018, the cloud cover was recorded as 10 to 100% (few to overcast), visibility was greater than 6 km (3.7 miles), and no precipitation was recorded. Winds of calm to 14 knots blew from a westerly and south-westerly direction. The outside air temperature at the survey altitude was recorded as 80 to 81°F. The sea state was 1 (calm (rippled)) 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 20 birds (Table 1), 502 rays, 13 turtles and 4 sharks (Table 2) were recorded in the Survey Area in August 2018. No marine mammals were recorded. The most abundant group recorded was rays (n=502), followed by shearwaters (n=16), turtles (n=13), sharks (n=4), petrels (n=2), herons (n=1) and gulls (n=1).

The loggerhead turtle, Kemp's ridley turtle, loggerhead / Kemp's ridley turtles and the unknown turtle species recorded during the survey are classified as Endangered¹ species.

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

Group	Species	Flying	Sitting	Total
Petrel	Black-capped Petrel	1	-	1
	Species Unknown	1	-	1
Shearwater	Cory's Shearwater	11	4	15
	Great Shearwater	1	-	1
Heron	Great Blue Heron	1	-	1
Gull	Great Black-backed Gull	1	-	1
Total Birds		16	4	20

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

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

Group	Species	Surfacing	Submerged	Total
Turtle	Kemp's Ridley Turtle	-	4	4
	Loggerhead Turtle	3	2	5
	Loggerhead / Kemp's Ridley Turtle	2	1	3
	Species Unknown	-	1	1
Total Turtles		5	8	13
Group	Species	Surfacing	Submerged	Total
Shark	Species Unknown	-	4	4
Total Sharks		-	4	4
Group	Species	Surfacing	Submerged	Total
Ray	Cownose Ray	-	502	502
Total Rays		-	502	502

4.2 Spatial Distribution

Figure 1 shows the location of birds recorded throughout the Survey Area. No marine mammals were recorded.

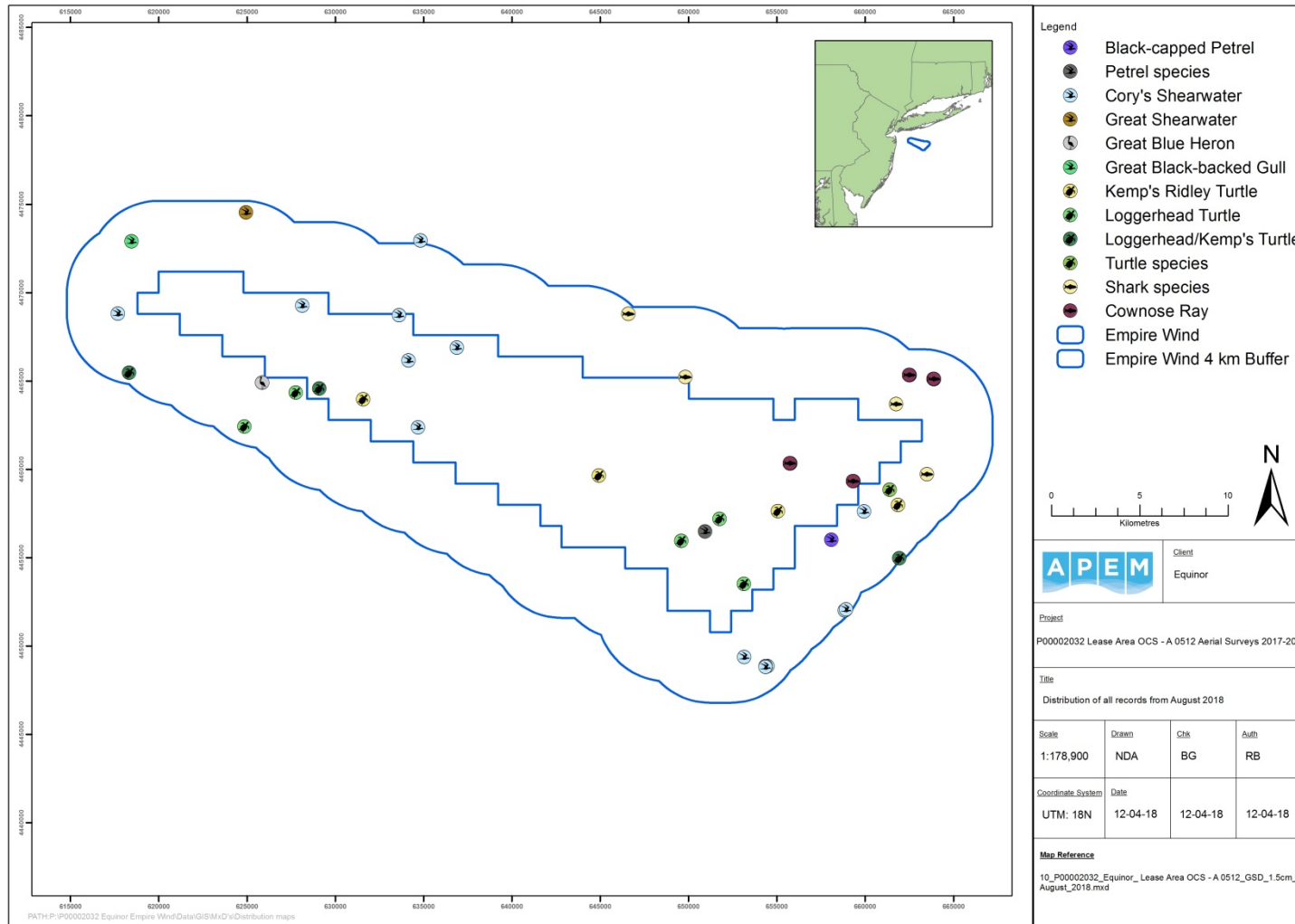


Figure 1 Distribution of all records from the August 2018 survey of Lease Area OCS-A 0512 plus 4 km (2.5 mile) buffer.

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

5. Shipping Observations

No vessels were recorded visually during the flight on the 16th August 2018. One small fishing vessel was recorded stationary (Latitude 40.25, Longitude -073.28) observed from the aircraft on the 17th August 2018.

No vessels were recorded in the imagery.

6. General Conclusions

A total of 20 birds and marine fauna were recorded in the Survey Area in August 2018. The most abundant group recorded was rays (n=502), followed by shearwaters (n=16), turtles (n=13), sharks (n=4), petrels (n=2), herons (n=1) and gulls (n=1).

A total of 16 birds (80%) were recorded in flight during this survey. These consisted of Cory's shearwater (n=11), great shearwater (n=1), black-capped petrel (n=1), great blue heron (n=1), great black-backed gull (n=1) and petrel species (n=1). There were 4 birds recorded as sitting (20%).

A total of 13 turtles were recorded, consisting of five loggerhead turtle, four Kemp's ridley turtles, three loggerhead / Kemp's ridley turtles and one unidentified turtle species. These turtle species are listed as Endangered (Federally listed as Threatened or Endangered, and New York State listed as Endangered).

Appendix I Species List in Taxonomic Order

Common Name	Scientific Name	Family	Class
Black-capped Petrel	<i>Pterodroma hasitata</i>	Procellariidae	Aves
Cory's Shearwater	<i>Calonectris diadomea</i>	Procellariidae	Aves
Great Shearwater	<i>Ardenna gravis</i>	Procellariidae	Aves
Great Blue Heron	<i>Ardea herodias</i>	Ardeidae	Aves
Great Black-backed Gull	<i>Larus marinus</i>	Laridae	Aves
Loggerhead Turtle	<i>Caretta caretta</i>	Cheloniidae	Reptilia
Kemp's Ridley Turtle	<i>Lepidochelys kempii</i>	Cheloniidae	Reptilia
Cownose Ray	<i>Rhinoptera bonasus</i>	Rhinopteridae	Chondrichthyes