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Environmental Imaging Solutions

**Year 2 Digital Aerial Wildlife Survey of BOEM Lease Area OCS-A  
520**

**Monthly Report (Year 2): September I 2021**

**Equinor Wind US**

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Matthew Arundale, Simon Warford, Julia Robinson-Willmott, and Derek Fair

**Client:** Scott Lundin

**Address:** Equinor Wind US  
1 Lincoln Street  
Boston  
Massachusetts  
02111

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**Project Director:** Gillian Sutherland

**Project Manager:** Derek Fair

**Key Contributors:** Matthew Arundale, Simon Warford, Julia Robinson-Willmott  
(Normandeau Associates)

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APEM, Inc.  
2603 NW 13<sup>th</sup> Street  
#402  
Gainesville  
Florida  
FL 32609

Tel: (352) 559-9155

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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 September 7<sup>th</sup>, 2021 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 first September 2021 survey are presented here.
- A total of 14 birds were recorded in the first September 2021 Survey Area. The most abundant group recorded was shorebirds (n=6), followed by shearwaters (n=3), gannets (n=2), and storm petrels (n=1), gulls (n=1), and unclassified birds (n=1).
- A total of three birds (21%) were recorded in flight during the survey. These consisted of Cory's shearwater (n=1), storm petrel species (n=1), and unidentified bird species (n=1). There were 11 birds (79%) recorded as sitting.
- Ninety-seven marine mammals were recorded during the survey, consisting of common dolphin (n=95), and unidentified dolphin species (n=2).
- Two turtles were recorded during the survey, consisting of loggerhead turtle (n=1), and Kemp's ridley turtle (n=1).
- Sixteen sharks were recorded during the survey, consisting of unidentified shark species (n=6), blue shark (n=5), unidentified Carcharhinidae shark species (n=2), white shark (n=2), and scalloped hammerhead (n=1).
- Four large bony fish were recorded during the survey, consisting of, ocean sunfish (n=2), mahi-mahi (n=1), and unidentified billfish species (n=1).
- No rays were recorded.
- The loggerhead turtle, Kemp's ridley turtle, and scalloped hammerhead are ESA-Listed species (Federally Listed as Threatened or Endangered and Massachusetts State Listed as Threatened, Federally and Massachusetts State Listed as Endangered, and Federally Listed as Threatened or Endangered respectively).

## 2. Introduction

APEM and Normandeau were contracted by Equinor Wind US to provide combined spring through fall digital aerial wildlife surveys of the Massachusetts Lease Area OCS-A 0520. This will comprise the second year of surveys following the initial Year 1 surveys undertaken from March 2020 to November 2021. Surveys will be carried out on a monthly basis from March 2021 through October 2021, 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 the spring to fall period. 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 September 2021 survey.

## 3. Summary of Survey

The survey was undertaken on September 7<sup>th</sup>, 2021 from 17:03 to 19:07 (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 September 7<sup>th</sup>, 2021, the cloud cover was recorded as 0-5% (clear – few), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Wind speed was recorded as 10-15 knots from a westerly direction. The outside air temperature at the survey altitude was recorded as 65-69°F. The sea state was 1 (calm [rippled]), and the water turbidity was 0 (clear). The survey was 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.

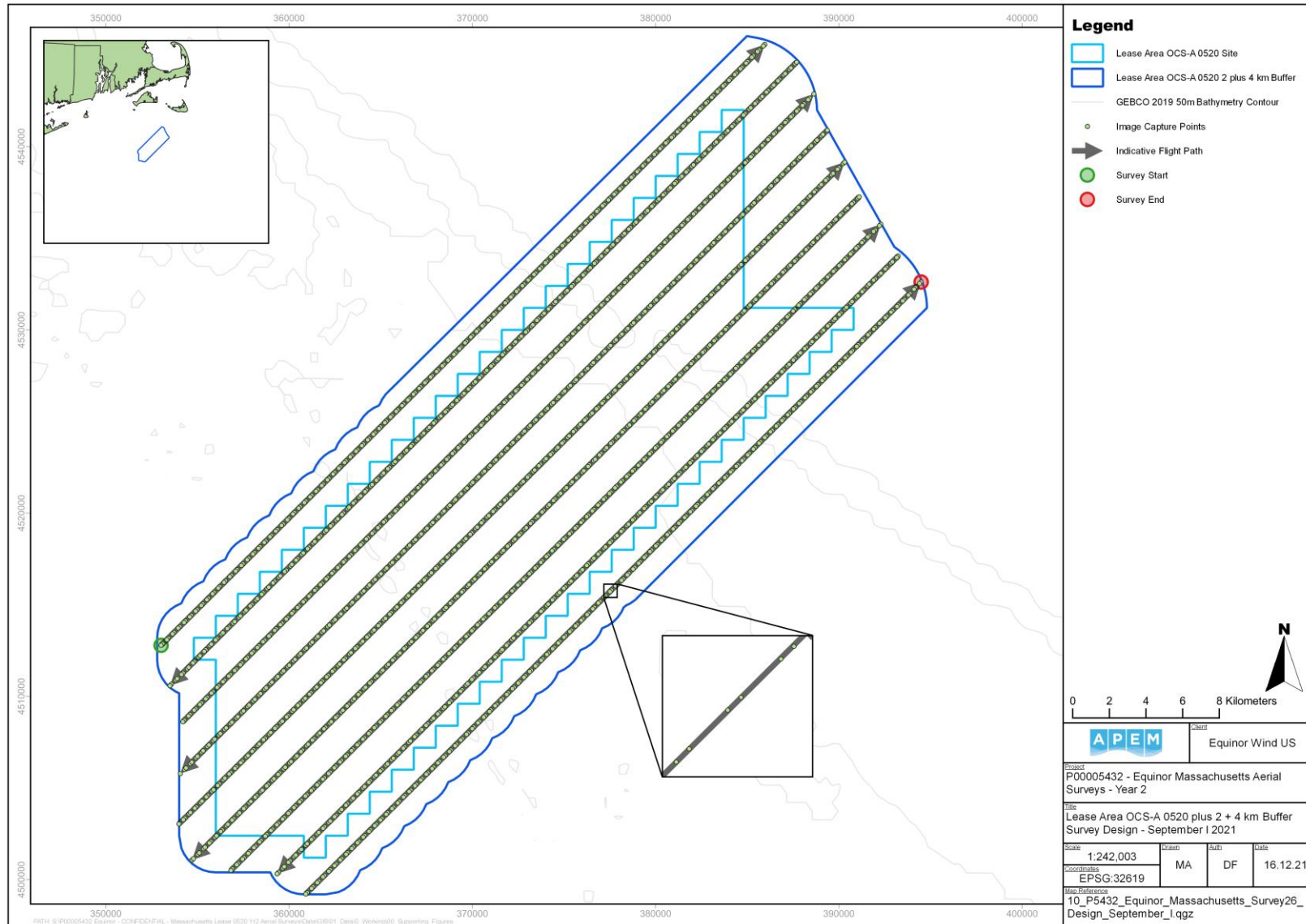


Figure 1 Survey design of Lease Area OCS-A 0520 plus 2 km / 4 km buffer

## 4. Abundance and Distribution

### 4.1 Species Abundance

The numbers of marine wildlife species recorded during the first September 2021 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 first September 2021 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer**

Group	Species	Flying	Sitting	Total
Shorebird	Red Phalarope	0	6	<b>6</b>
Gull	Large Gull species	0	1	<b>1</b>
Storm Petrel	Storm Petrel species	1	0	<b>1</b>
Shearwater	Cory's Shearwater	1	2	<b>3</b>
Gannet	Northern Gannet	0	2	<b>2</b>
Unclassified Bird	Unidentified Bird species	1	0	<b>1</b>
<b>Total Birds</b>		<b>3</b>	<b>11</b>	<b><u>14</u></b>

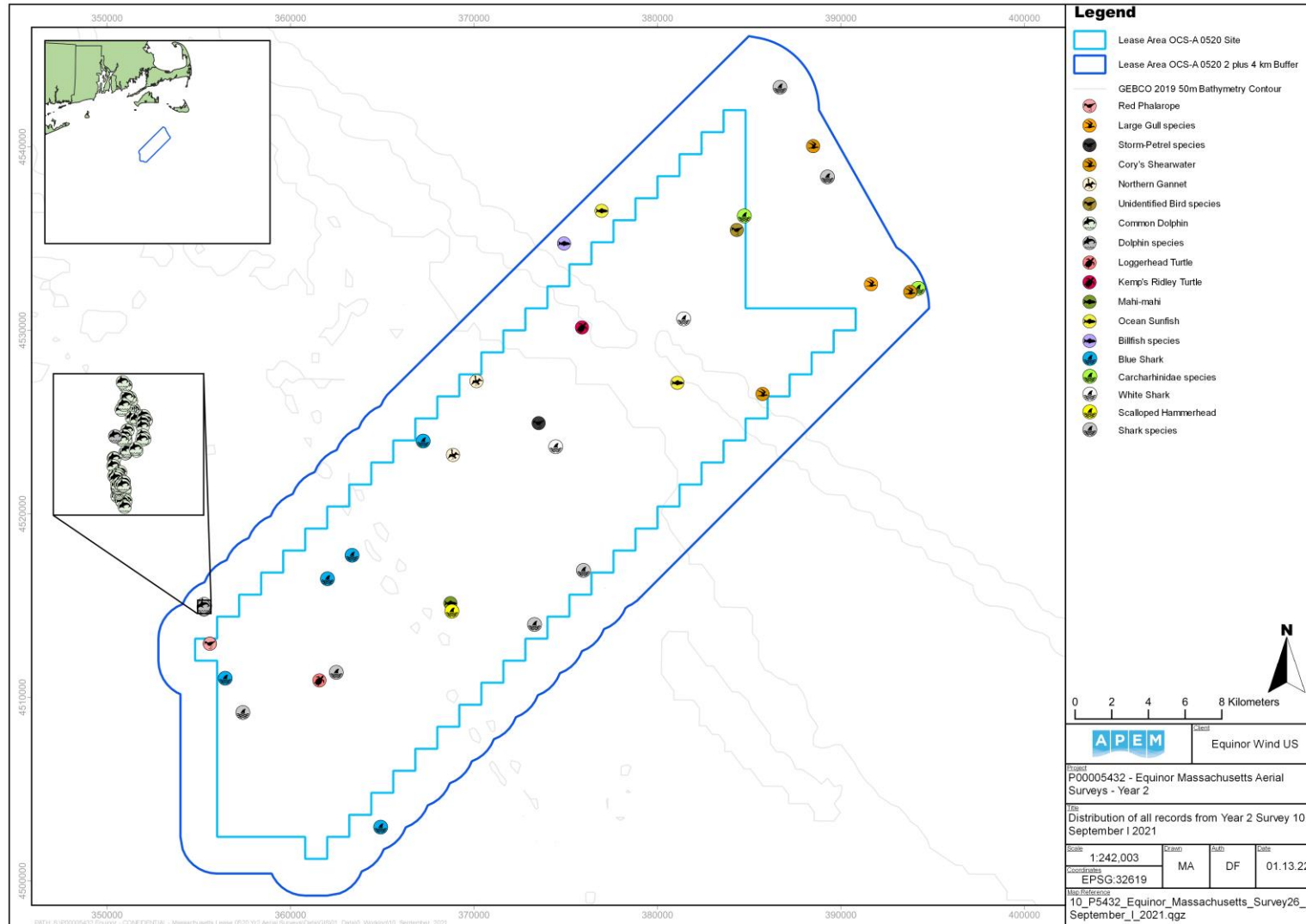
**Table 2 Total number of individuals of marine megafauna recorded during the first September 2021 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer**

Group	Species	Submerged	Surfacing	Total
Marine Mammal	Common Dolphin	95	0	<b>95</b>
	Dolphin species	2	0	<b>2</b>
Turtle	Loggerhead Turtle	1	0	<b>1</b>
	Kemp's Ridley Turtle	1	0	<b>1</b>
Large Bony Fish	Mahi-mahi	1	0	<b>1</b>
	Ocean Sunfish	2	0	<b>2</b>
	Billfish species	1	0	<b>1</b>
Shark	Blue Shark	5	0	<b>5</b>
	Carcharhinidae Shark species	2	0	<b>2</b>
	White Shark	2	0	<b>2</b>
	Scalloped Hammerhead	1	0	<b>1</b>
	Shark species	6	0	<b>6</b>
<b>Total Marine Megafauna</b>		<b>119</b>	<b>0</b>	<b><u>119</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 first September 2021 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.

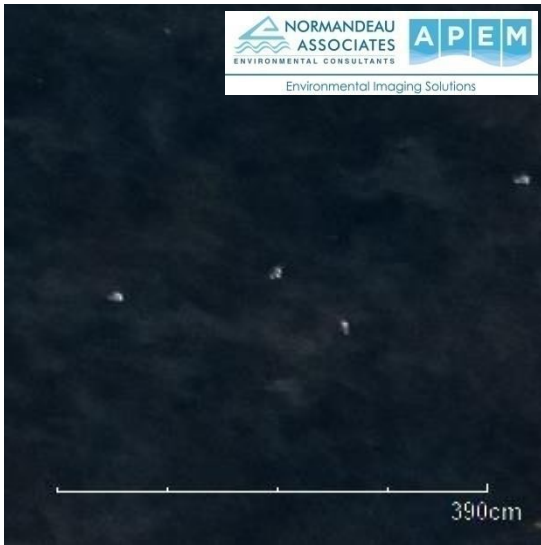
## 5. Shipping Observations

During the September 7<sup>th</sup>, 2021 survey, no vessels were recorded visually from the aircraft or in the imagery.

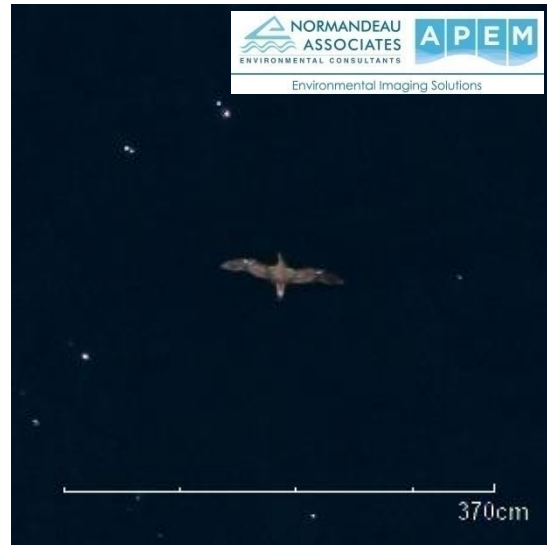
## Appendix I Species List

Common Name	Scientific Name	Family	Class
Red Phalarope	<i>Phalaropus fulicarius</i>	Scolopacidae	Aves
Cory's Shearwater	<i>Calonectris borealis</i>	Procellariidae	Aves
Northern Gannet	<i>Morus bassanus</i>	Sulidae	Aves
Common Dolphin	<i>Delphinus delphis</i>	Delphinidae	Mammalia
Loggerhead Turtle	<i>Caretta caretta</i>	Cheloniidae	Reptilia
Kemp's Ridley Turtle	<i>Lepidochelys kempii</i>	Cheloniidae	Reptilia
Mahi-mahi	<i>Coryphaena hippurus</i>	Coryphaenidae	Actinopterygii
Ocean Sunfish	<i>Mola mola</i>	Molidae	Actinopterygii
Blue Shark	<i>Prionace glauca</i>	Carcharhinidae	Chondrichthyes
White Shark	<i>Carcharodon carcharias</i>	Lamnidae	Chondrichthyes
Scalloped Hammerhead	<i>Sphyrna lewini</i>	Sphyrnidae	Chondrichthyes

## Appendix II Example 'Snags' from the Survey



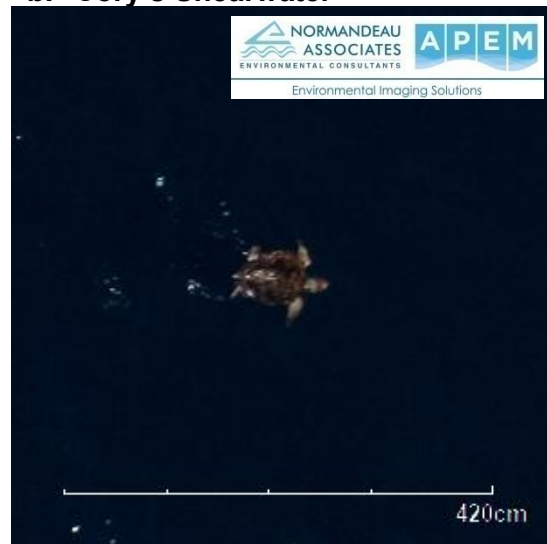
**a. Red Phalaropes**



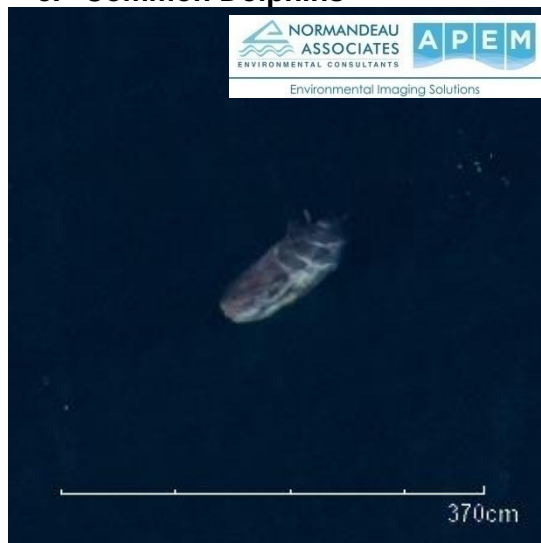
**b. Cory's Shearwater**



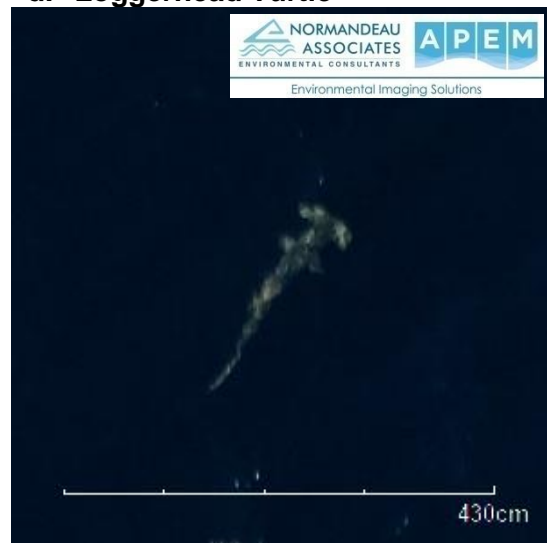
**c. Common Dolphins**



**d. Loggerhead Turtle**



**e. Ocean Sunfish**



**f. Scalloped Hammerhead**