



Environmental Imaging Solutions

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

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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 June 14th, 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 June 2020 survey are presented here.
- A total of 118 birds were recorded in the June 2020 survey area. The most abundant group recorded was shearwaters (n=95), followed by gulls (n=11), storm-petrels (n=9), terns (n=2), and gannets (n=1).
- A total of 54 birds (46%) were recorded in flight during the survey. These consisted of great shearwater (n=13); sooty shearwater (n=12); unidentified storm-petrel species (n=9); unidentified shearwater species (n=8); great black-backed gull (n=6); 'commic' / Forster's tern (n=2); herring gull (n=2); Cory's shearwater (n=1); and northern gannet (n=1). There were 64 birds (54%) recorded as sitting.
- A total of 30 marine mammals were recorded, consisting of common dolphin (n=13); unidentified dolphin species (n=6); common bottlenose dolphin (n=4); common minke whale (n=1); fin whale (n=1); humpback whale (n=1); unidentified beaked whale species (n=1); gray seal (n=1); unidentified seal species (n=1); and unidentified marine mammal species (n=1).
- A total of 23 large bony fish, consisting of ocean sunfish (22); and Atlantic bluefin tuna (n=1) were also recorded, as well as 29 sharks, consisting of blue shark (n=21); basking shark (n=3); unidentified shark species (n=3); shortfin mako (n=1); and unidentified Carcharhinidae shark species (n=1)
- No turtles or rays were recorded during the June survey.
- Fin whale, humpback whale, Atlantic bluefin tuna, shortfin mako, and basking shark are Listed species (Federally Listed as Endangered, Massachusetts State Listed as 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 June 2020 survey.

3. Summary of Survey

The survey was undertaken on June 14th, 2020 from 17:59 to 19:51 (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 June 14th, 2020, the cloud cover was recorded as 0-10% (clear to few), visibility was greater than 10 km (6.2 miles), and no precipitation was recorded. Wind speed was recorded as 30 knots from a northeasterly direction. The outside air temperature at the survey altitude was recorded as 63 to 64°F. The sea state was 2-3 (smooth to slightly moderate), and the water turbidity was 1 (slightly 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, 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.

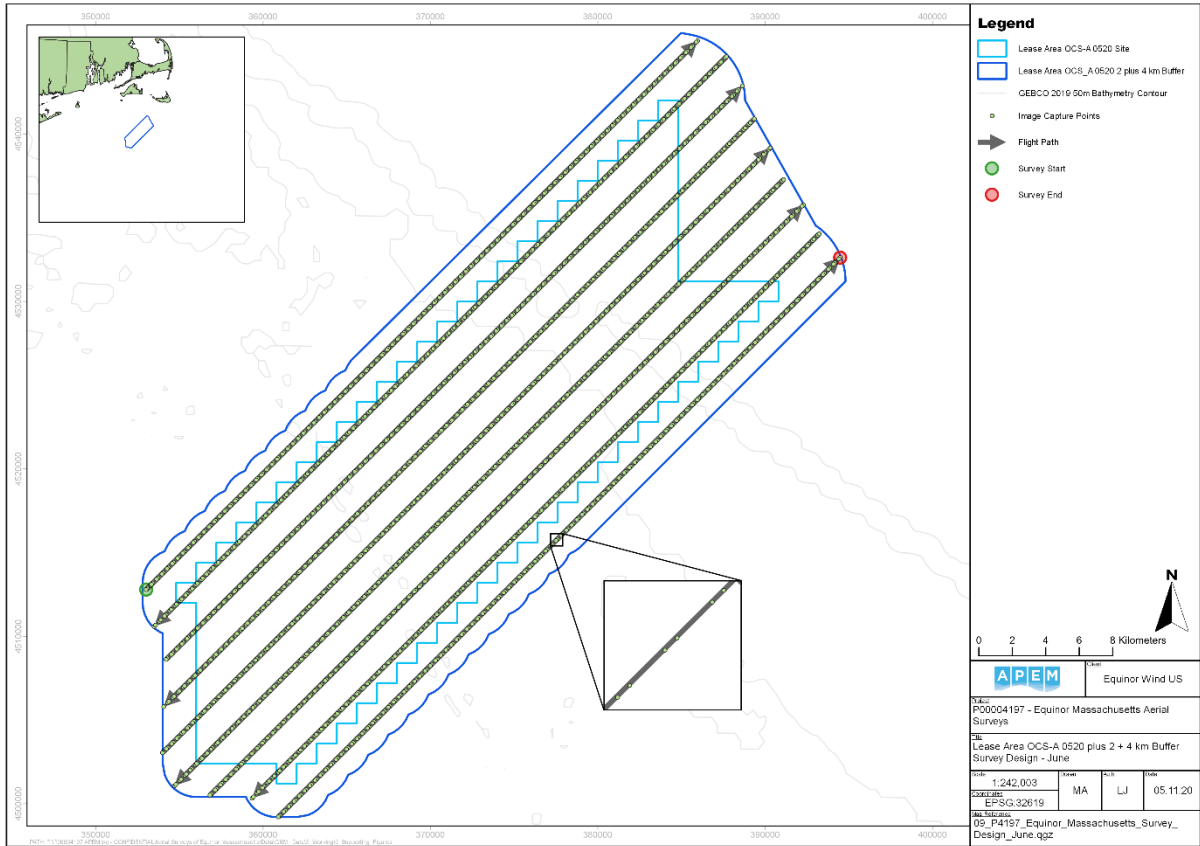


Figure 1 Survey design of Lease Area OCS-A 0520 plus 2 km / 4 km buffer

4. Abundance and Distribution

4.1 Species Abundance

The numbers of marine wildlife species recorded during the June 2020 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 June 2020 survey of the Lease Area OCS-A 0520 WEA plus 2 km / 4 km irregular buffer

Group	Species	Flying	Sitting	Total
Storm-petrel	Storm-petrel sp. – unidentified	9	0	9
Shearwater	Cory's Shearwater	1	0	1
	Sooty Shearwater	12	3	15
	Great Shearwater	13	5	18
	Large Shearwater sp. – unidentified	0	52	52
	Shearwater sp. – unidentified	8	1	9
Gannet	Northern Gannet	1	0	1
Gull	Great Black-backed Gull	6	3	9
	Herring Gull	2	0	2
Tern	'Commic'* / Forster's Tern	2	0	2
Total Birds		54	64	<u>118</u>

**'Commic' refers to either common or Arctic tern*

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

Group	Species	Submerged	Surfacing	Total
Marine Mammal	Common Minke Whale	1	0	1
	Fin Whale	1	0	1
	Humpback Whale	1	0	1
	Beaked Whale sp. – unidentified	1	0	1
	Common Dolphin	8	5	13
	Common Bottlenose Dolphin	4	0	4
	Dolphin sp. – unidentified	6	0	6
	Gray Seal	0	1	1
	Seal sp. – unidentified	1	0	1
	Marine Mammal sp. – unidentified	1	0	1
Large Bony Fish	Ocean Sunfish	22	0	22
	Atlantic Bluefin Tuna	1	0	1
Shark	Blue Shark	21	0	21
	Basking Shark	3	0	3
	Shortfin Mako	1	0	1

Group	Species	Submerged	Surfacing	Total
	Carcharhinidae Shark sp. – unidentified	1	0	1
	Shark sp. – unidentified	3	0	3
Total		76	6	<u>82</u>

4.2 Spatial Distribution

Figure 2 shows the location of all species recorded throughout the Survey Area.

Figure 3 shows the location and direction of travel for recorded Listed species (Federally Listed as Threatened or Endangered, Massachusetts State Listed as Endangered) from the June 2020 survey. A fin whale, a shortfin mako, and three basking sharks were located in the southwest of the Survey Area, the majority of which were traveling in an easterly direction. A humpback whale was recorded in the center of the Survey Area, also traveling in an easterly direction. An Atlantic bluefin tuna was also recorded in the center of the Survey Area, traveling in a southeasterly direction.

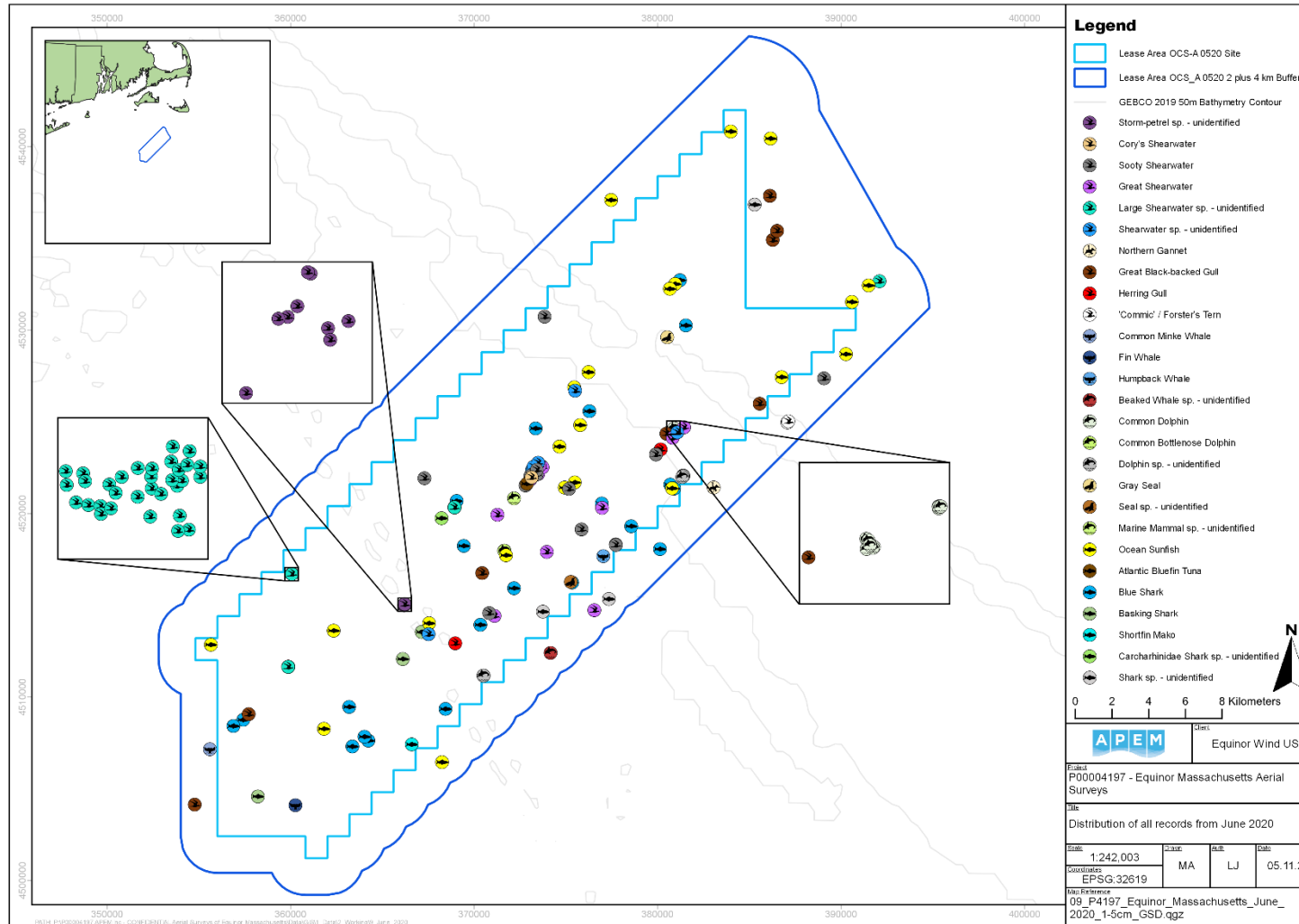


Figure 2 Distribution of all records from the June 2020 survey of Lease Area OCS-A 0520 plus 2 km / 4 km irregular buffer

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

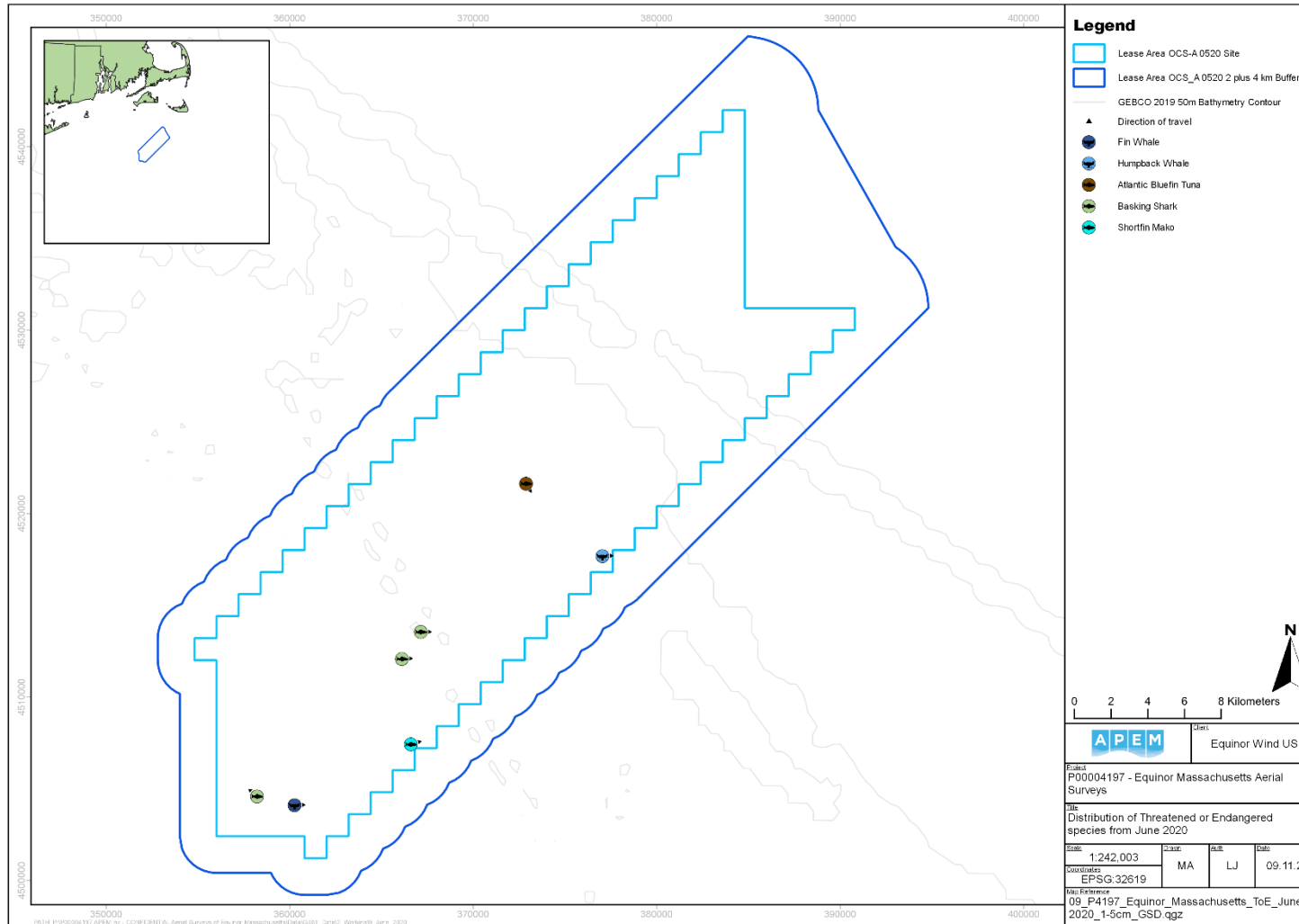


Figure 3 Distribution of Threatened or Endangered species from the June 2020 survey of Lease Area OCS-A 0520 plus 2 km / 4 km irregular buffer

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

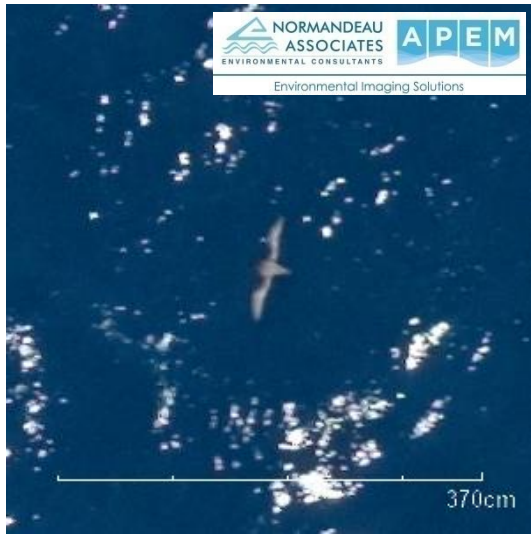
5. Shipping Observations

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

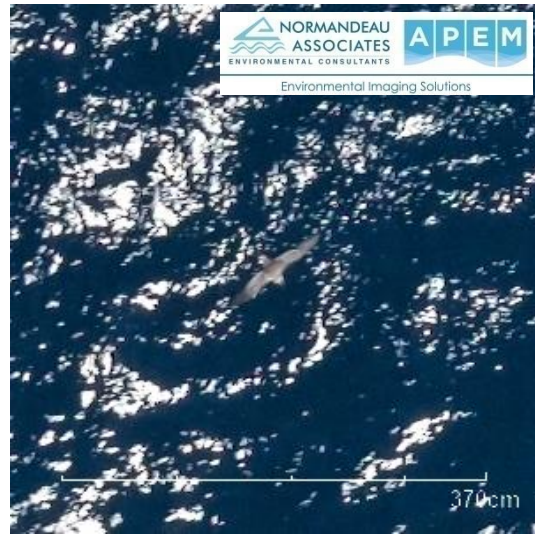
Appendix I Species List

Common Name	Scientific Name	Family	Class
Cory's Shearwater	<i>Calonectris borealis</i>	Procellariidae	Aves
Sooty Shearwater	<i>Ardenna grisea</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
Common Tern	<i>Sterna hirundo</i>	Laridae	Aves
Arctic Tern	<i>Sterna paradisaea</i>	Laridae	Aves
Common Minke Whale	<i>Balaenoptera acutorostrata</i>	Balaenopteridae	Mammalia
Fin Whale	<i>Balaenoptera physalus</i>	Balaenopteridae	Mammalia
Humpback Whale	<i>Megaptera novaeangliae</i>	Balaenopteridae	Mammalia
Common Dolphin	<i>Delphinus delphis</i>	Delphinidae	Mammalia
Common Bottlenose Dolphin	<i>Tursiops truncatus</i>	Delphinidae	Mammalia
Gray Seal	<i>Halichoerus grypus</i>	Phocidae	Mammalia
Ocean Sunfish	<i>Mola mola</i>	Molidae	Actinopterygii
Atlantic Bluefin Tuna	<i>Thunnus thynnus</i>	Scombridae	Actinopterygii
Blue Shark	<i>Prionace glauca</i>	Carcharhinidae	Chondrichthyes
Basking Shark	<i>Cetorhinus maximus</i>	Cetorhinidae	Chondrichthyes
Shortfin Mako	<i>Isurus oxyrinchus</i>	Lamnidae	Chondrichthyes

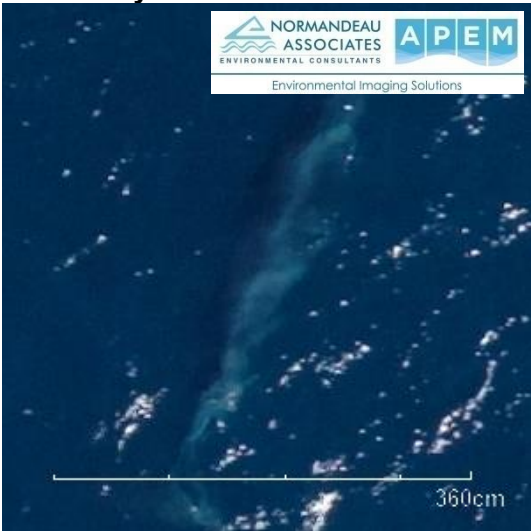
Appendix II Example 'Snags' from the Survey



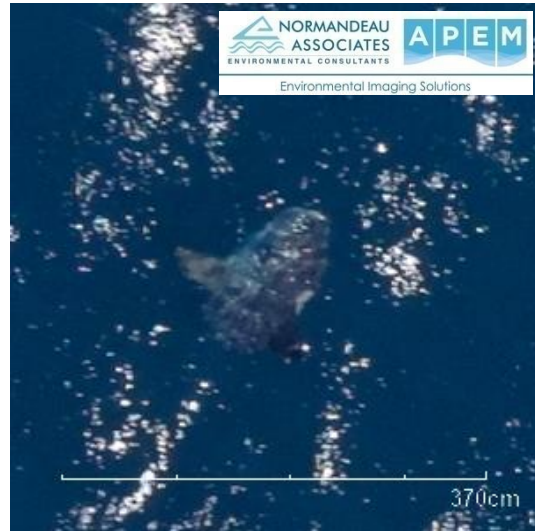
a. Sooty Shearwater



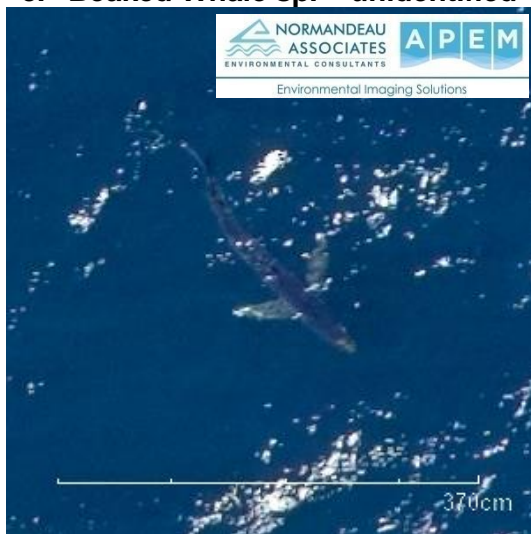
b. Great Shearwater



c. Beaked Whale sp. – unidentified



d. Ocean Sunfish



e. Blue Shark



f. Basking Shark