Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy

Winter 2018-2019 Taxonomic Analysis Summary Report

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ENVIRONMENTAL CONSULTANTS

APEM

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Introduction

The third winter survey for the NYSERDA offshore planning area (OPA) was started on February 3, 2019, and completed on February 17, 2019. The survey took eight days to complete with poor weather conditions causing occasional down days as well as short survey days on days when surveys were undertaken. These surveys are designed to characterize the usage of the area by marine fauna to aid in the planning for offshore wind.

Methods

Data were collected for the OPA including a 300-m buffer. The survey collected imagery covering a 3,145.41 km^2 area of the OPA and 300-m buffer using a transect design (Table 1), which amounts to 319,941 images. Of the 319,941 images analyzed, 314,221 were blank (Table 2). The target extraction identified 16,415 objects within imagery collected in the OPA and 300-m buffer survey area (Table 3). These targets were categorized into six groups representing avian (birds), marine mammals, sharks, large bony fish individuals (excluding fish shoals), vessels, and fixed structures. Each group was assigned to taxonomic experts for identification. Large bony fish and fish shoals are the topic of a separate report. Targets extracted that were identified as trash or other floating debris were removed from the dataset. No bats were found in imagery. Species listed as "Endangered" on the state threatened and endangered list and as "Endangered" or "Threatened" under the federal Endangered Species Act were flagged for review.

Table 1. Total Images and Area Surveyed

Area	Total Number of Images Collected	km^2 of Analyzed Images within the Survey Area	Percent Coverage	Survey Area (km^2)
OPA	319,941	3,145.41	7.19%	43,745.20

Table 2. Blank Images Detected

Area	Total Images Analyzed	Blank Images			
		Number Detected	Number Sent for QA	Total Percent QA	Total Percent Blank
OPA	319,941	314,221	31,437	10%	98.21%

Table 3. Targets Sent for Identification

Group	# Individuals
Avian	15,094
Marine Mammals	1,306
Sharks	1
Large Bony Fish**	6
Vessels	6
Fixed Structures	2
Total	**16,415**

**Large bony fish and fish shoals are the topic of a separate report

Quality Control

Biologists highly experienced in their species groups made all initial identifications. A second taxonomic expert re-identified a minimum of 20% of all avian and marine mammal images and taxonomic agreement had to meet a minimum of 90% concurrence (Table 4). Failure to do so would trigger a review of 100% of identifications made by the original taxonomist. The 20% review included quality control review of 100% of ESA-listed species, and for endangered species a 100% agreement had to be reached on identifications (Table 5). Additional experts on the species concerned were called in to arbitrate identifications when concurrence could not be reached.

Results

All target extraction and quality control of target extraction were completed in March 2020. All animals were identified, and all identifications reached quality control standards. Animals were also fully georeferenced and exact locations of individuals are available for review on the data portal. A full list of identified species can be found in the Appendix.

Quality Control Results (Fall 2018)

Table 4. Quality Control Results, All Groups

Group	Number of Images	Number of Images for QC	% Agreement
Avian	15,094	3,019	100
Marine Mammals	1,306	264	100
Sharks	1	0	--
Large Bony Fish	6	0	--
Total	**16,407**	**3,283**	**100**

Table 5. Quality Control Results, Endangered Species Only

Group	Number of Images	% Agreement
Marine Mammals	4	100
Total	**4**	**100**

Identification Success

Identification success varied by species group and by depth of subsurface animals. All identifications had a level of certainty ascribed to them (e.g., possible, probable, and definite). Subsurface animals were also ranked as “breaching,” “near surface,” and “significantly submerged.” The reason for this was to be able to evaluate whether the inability to identify animals to species stemmed from image quality, angle of the animal at point of capture, or from depth in the water. Digital imagery captured from downward rather than angled sensors “sees” through the water column more effectively, and more animals are “observed.” Visual surveyors from boats and digital imagery captured by angled lenses will “see” fewer animals to a greater or lesser degree because subsurface animals are hidden by the water column. However, this improvement in reporting animal presence by downward facing lenses sometimes is at a cost of species identification because of the depth of the animal.

Avian

Avian species-level identifications varied by species group depending on size, coloration, and flight activity. Birds that are both small and sitting are generally more difficult to identify, and groups that contain multiple species that are morphologically similar are also difficult to distinguish. In this survey

we found large numbers of auks (n=2,729) of which there are several morphologically similar species commonly found in the study area, and 61% could be confidently identified to species (Table 6). We also found a large number of ducks (n=5,007) of which there are multiple species to be found in the area with females all looking very similar. This species group is easier to identify in flight, but despite 98% of the birds found were sitting, an 88% identification success was reached (Table 6). We encountered only three phalaropes of which two species are commonly found in the project area and one of which we were able to identify (Table 6). Cormorants are difficult to distinguish, with two species expected in the area but we encountered only one individual. All bird identifications were classified to species or species group (Table 7). Total identification success was 88%.

This season had moderate bird activity with 15,094 individuals recorded representing 24 species (see Table 7). Gulls (n=5,696) and ducks (n=5,007) were the most numerous groups present, followed by auks (n=2,729), gannets (n=1,233), loons (n=355), fulmars (n=59), skuas (n=5), grebes (n=4), phalaropes (n=3), shearwaters (n=2), and a solitary cormorant.

Avian flight height data will be presented in detail in the annual report. Over 17% of birds were flying (Table 7).

Table 6. Avian Groups Identified, Percent ID Success to Species, and Percent Sitting (rounded)

Group	# Individuals	% ID Success	% Sitting
Duck	5,007	88	98
Loon	355	96	99
Grebe	4	100	100
Fulmar	59	100	8
Shearwater	2	50	50
Gannet	1,233	100	67
Cormorant	1	0	100
Phalarope	3	33	100
Skua	5	100	0
Auk	2,729	61	96
Gull	5,696	98	68
Total	15,094		
		Overall % ID Success	**Overall % Sitting**
Total Individuals	**15,094**	**88%**	**83%**

Table 7. Number of Avian Species Identified and Number and

Avian Group/ Species	OPA		
	# Individuals	# Flying	% Flying
Duck	**5,007**	**82**	**2**
Common Eider	7	0	0
Surf Scoter	43	3	7
White-winged Scoter	4,241	72	2
Black Scoter	70	3	4
Scoter unid.	583	0	0
Long-tailed Duck	41	4	10
Bufflehead	12	0	0
Red-breasted Merganser	1	0	0
species unknown	9	0	0
Loon	**355**	**4**	**1**
Red-throated Loon	88	4	5
Common Loon	252	0	0
species unknown	15	0	0
Grebe	**4**	**0**	**0**
Horned Grebe	4	0	0
Fulmar	**59**	**54**	**92**
Northern Fulmar	59	54	92
Shearwater	**2**	**1**	**50**
Manx Shearwater	1	1	100
species unknown	1	0	0
Gannet	**1,233**	**408**	**33**
Northern Gannet	1,233	408	33
Cormorant	**1**	**0**	**0**
species unknown	1	0	0
Phalarope	**3**	**0**	**0**
Red Phalarope	1	0	0
Red/Red-necked Phalarope	2	0	0
Skua	**5**	**5**	**100**
Great Skua	5	5	100
Auk	**2,729**	**106**	**4**
Dovekie	1,008	69	7
Common/Thick-billed Murre	1	1	100
Razorbill	9	0	0
Murre/Razorbill	983	29	3
Atlantic Puffin	648	6	1
species unknown	80	1	1
Gull	**5,696**	**1,842**	**32**
Black-legged Kittiwake	174	147	84
Bonaparte's Gull	17	16	94
Ring-billed Gull	22	15	68

Avian Group/ Species	OPA		
	# Individuals	# Flying	% Flying
Herring Gull	3,506	1,043	30
Lesser Black-backed Gull	9	2	22
Great Black-backed Gull	1,845	606	33
species unknown - Large	77	9	12
species unknown - Small	24	1	4
species unknown	22	3	14
Total	**15,094**	**2,502**	**17**

Turtles

No turtles were found in imagery.

Marine Mammals

There were 1,306 marine mammals recorded during the Winter 2018–2019 survey (Table 8). Most of these were dolphins (n=1,284) consisting of six identified species or groups, as follows:

- Common dolphin (n=472)
- Risso's dolphin (n=29)
- Striped dolphin (n=270)
- Bottlenose dolphin (n=74)
- Common/white-sided dolphin (n=2)
- Harbor porpoise (n=43)
- Species unknown (n=394)

Eight unidentified seals were found (see Table 8).

Of four whales, two were sperm whales, one was a fin whale, and one was a sei whale (see Table 8).

Of the 1,284 dolphins, 815 (63%) were significantly submerged. Despite this high number of submerged individuals, 57% were identifiable to species. Of the 394 dolphins not identified to species or species group, 307 (78%) were classed as significantly submerged (Table 8).

Ten individual animals could not be classified beyond marine mammal and six were significantly submerged (Table 8).

Table 8. Marine Mammal Species Identified*

Species	# Individuals		Significantly Submerged	
	Group	Species	Number	Percent of total
Seal	**8**		**1**	**13**
species unknown		8	1	13
Whale	**4**		**2**	**50**
Fin Whale		1	1	100
Sei Whale		1	0	0
Sperm Whale		2	1	50
Dolphin	**1,284**		**815**	**63**
Common Dolphin		472	244	52

Species	# Individuals		Significantly Submerged	
	Group	Species	Number	Percent of total
Risso's Dolphin		29	19	66
Striped Dolphin		270	165	61
Bottlenose Dolphin		74	57	77
Common/White-sided Dolphin		2	0	0
Harbor Porpoise		43	23	53
species unknown		394	307	78
Unid. Mammal	**10**		**6**	**60**
species unknown		10	6	60
Total	**1,306**		**824**	**63**

*Highlighted species are classified as endangered

Rays and Sharks

No rays or sharks were found in the imagery.

Endangered Species

There were four species identified as state or federally threatened or endangered species (Table 9). These were fin whale (n=1), sei whale (n=1), and sperm whale (n=2) (Table 9).

Table 9. Threatened and Endangered Species Identified*

Species	# Individuals
Whale	**4**
Fin Whale	1
Sei Whale	1
Sperm Whale	2
TOTAL	**4**

*Highlighted species are classified as endangered

Spatial Distribution of Animals Treated as Threatened or Endangered

All animals have had their location mapped, and we have very precise location data. Graphical presentation of locations of animals spread over such a broad area is difficult as the size of the icon representing the animal suggests a greater spatial use than is real. A better idea of spatial use can be obtained by using the map tool in ReMOTe (remote.normandeau.com), which allows for zoom.

The following images show the location of the federally listed endangered species encountered in the Winter 2018–2019 Survey.

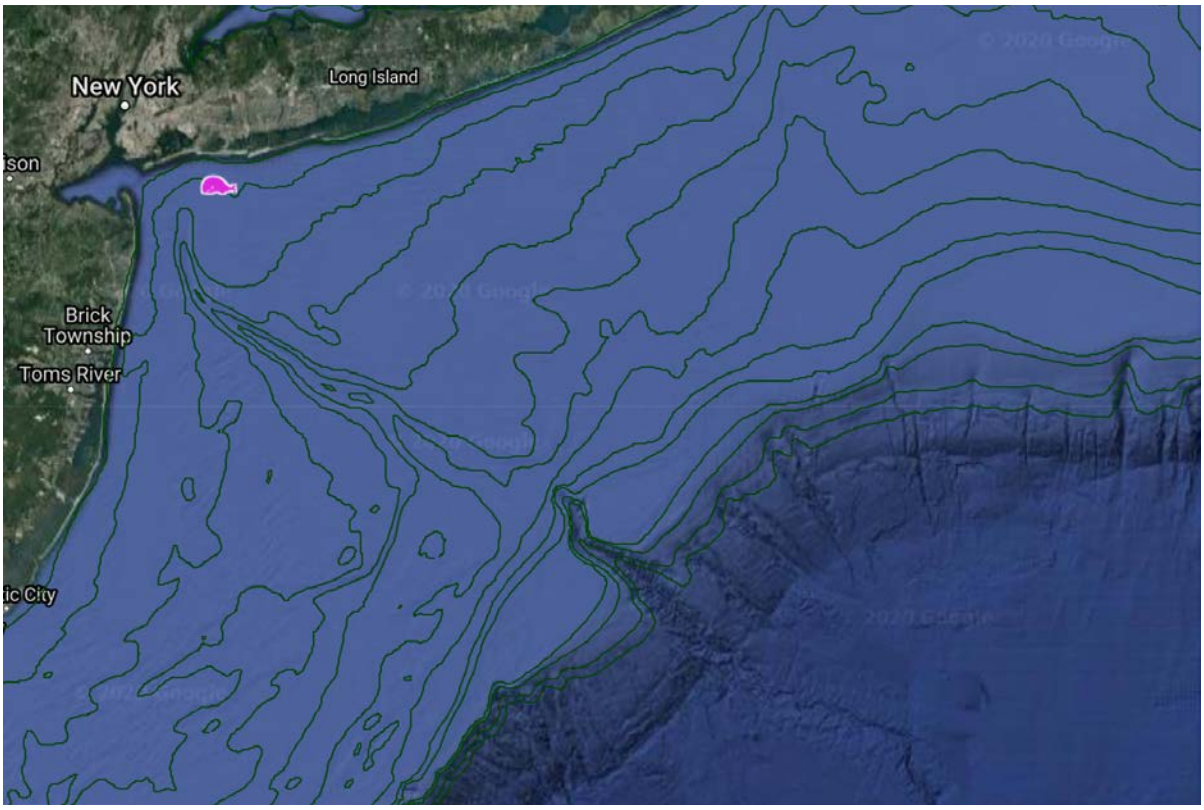

Figure 1. Fin Whale distribution during the Winter 2018–2019 survey.

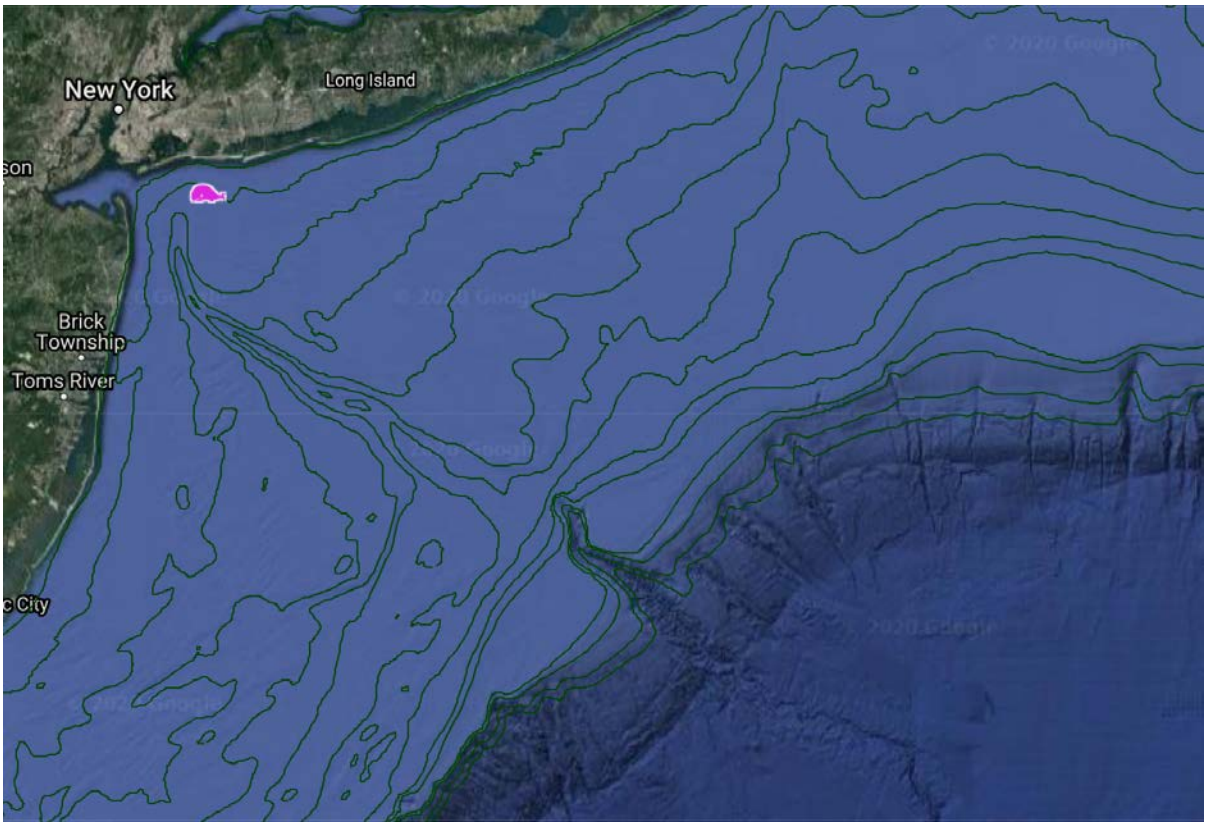

Figure 2. Sei Whale distribution during the Winter 2018–2019 survey.

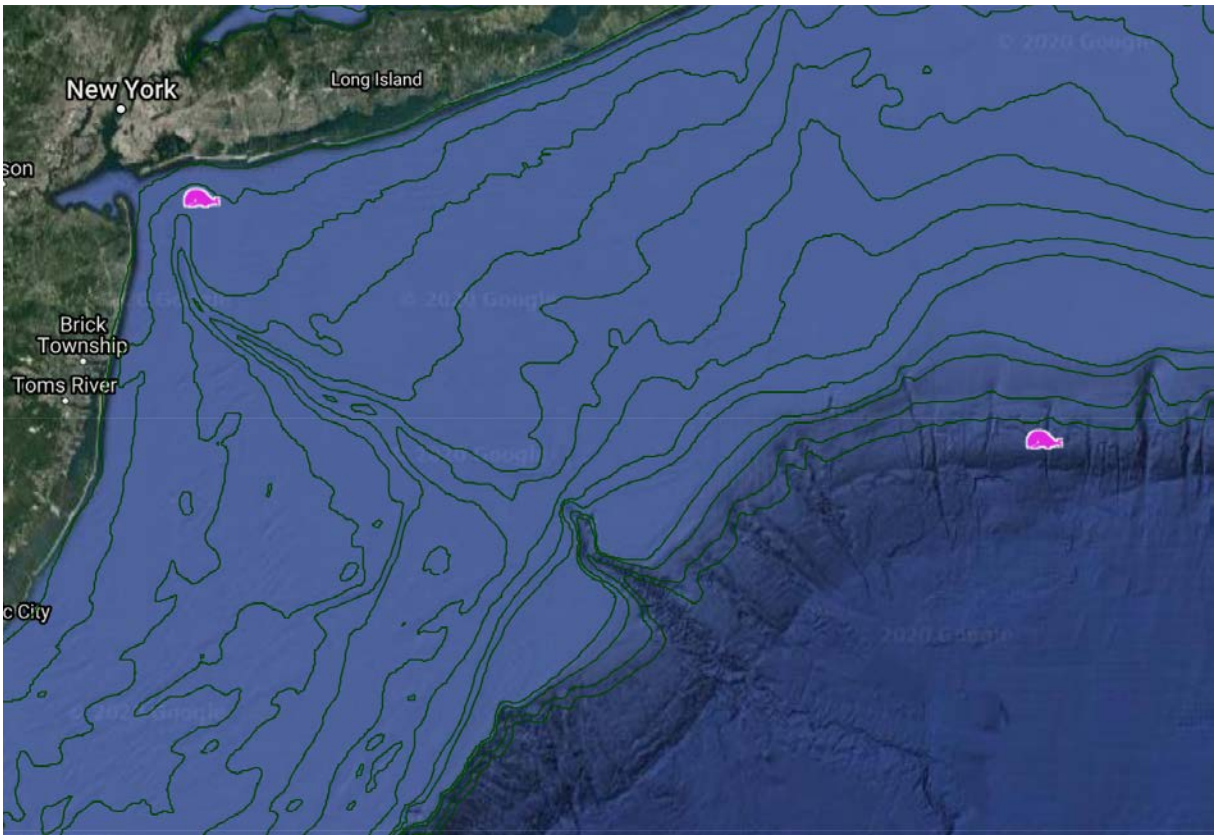

Figure 3. Sperm Whale distribution during the Winter 2018–2019 survey.

APPENDIX: List of Species Found in Imagery during the Winter 2018–2019 Survey in Taxonomic Order

Common Name	Scientific Name	Class	Family
Birds			
Common Eider	*Somateria mollissima*	Aves	Anatidae
Surf Scoter	*Melanitta perspicillata*	Aves	Anatidae
White-winged Scoter	*Melanitta fusca*	Aves	Anatidae
Black Scoter	*Melanitta americana*	Aves	Anatidae
Long-tailed Duck	*Clangula hyemalis*	Aves	Anatidae
Bufflehead	*Bucephala albeola*	Aves	Anatidae
Red-breasted Merganser	*Mergus serrator*	Aves	Anatidae
Red-throated Loon	*Gavia stellata*	Aves	Gaviidae
Common Loon	*Gavia immer*	Aves	Gaviidae
Horned Grebe	*Podiceps auritus*	Aves	Podicipedidae
Northern Fulmar	*Fulmarus glacialis*	Aves	Procellariidae
Manx Shearwater	*Puffinus puffinus*	Aves	Procellariidae
Northern Gannet	*Morus bassanus*	Aves	Sulidae
Red Phalarope	*Phalaropus fulicarius*	Aves	Scolopacidae
Great Skua	*Stercorarius skua*	Aves	Stercorariidae
Dovekie	*Alle alle*	Aves	Alcidae
Razorbill	*Alca torda*	Aves	Alcidae
Atlantic Puffin	*Fratercula arctica*	Aves	Alcidae
Black-legged Kittiwake	*Rissa tridactyla*	Aves	Laridae
Bonaparte's Gull	*Chroicocephalus philadelphia*	Aves	Laridae
Ring-billed Gull	*Larus delawarensis*	Aves	Laridae
Herring Gull	*Larus argentatus*	Aves	Laridae
Lesser Black-backed Gull	*Larus fuscus*	Aves	Laridae
Great Black-backed Gull	*Larus marinus*	Aves	Laridae
Marine Mammals			
Fin Whale	*Balaenoptera physalus*	Mammalia	Balaenopteridae
Sei Whale	*Balaenoptera borealis*	Mammalia	Balaenopteridae
Sperm Whale	*Physeter macrocephalus*	Mammalia	Physeteridae
Common Dolphin	*Delphinus delphis*	Mammalia	Delphinidae
Risso's Dolphin	*Grampus griseus*	Mammalia	Delphinidae
Striped Dolphin	*Stenella coeruleoalba*	Mammalia	Delphinidae
Bottlenose Dolphin	*Tursiops truncatus*	Mammalia	Delphinidae
Harbor Porpoise	*Phocoena phocoena*	Mammalia	Phocoenidae
Sharks			
Basking Shark	*Cetorhinus maximus*	Chondrichthyes	Cetorhinidae
Large Bony Fish*			
Mahi-Mahi			
Ocean Sunfish	*Mola Mola*	Actinopterygii	Molidae

*Large bony fish and fish shoals are the topic of a separate report