

Aerial Surveys for Protected Marine Species in the Cape Hatteras Region: 2016 Annual Progress Report

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Prepared by

Erin Cummings, Ryan McAlarney,
William A. McLellan, and D. Ann Pabst

Department of Biology and Marine Biology
University of North Carolina Wilmington
601 S. College Road
Wilmington, NC 28403

Submitted by:



Virginia Beach, VA



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Clymene dolphins (*Stenella clymene*). Photo collected by the University of North Carolina Wilmington under NOAA General Authorization for Scientific Research #16185 to Duke University.

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Acronyms and Abbreviations

BSS	Beaufort Sea State
km	kilometer(s)
m	meter(s)
SD	standard deviation
U.S.	United States

1. Introduction

This report forms part of a multi-institutional monitoring project intended to provide information on the species composition, population identity, density, and baseline behavior of marine mammals and sea turtles present in United States (U.S.) Navy range complexes along the U.S. Atlantic Coast. This program began in 2007, with baseline aerial and vessel surveys, as well as a passive acoustic monitoring component in Onslow Bay, North Carolina, and has since expanded to include survey areas off Jacksonville, Florida; Cape Hatteras, North Carolina; and Norfolk, Virginia. In Onslow Bay, six years of monitoring yielded a comprehensive picture of the density, distribution, and abundance of marine mammals and sea turtles and provided new insights into residency patterns among pelagic delphinid cetaceans in this region ([Read et al. 2014](#)). More than seven years of monitoring in Jacksonville have provided similar information on the density and distribution of marine mammals and sea turtles in this area. In Cape Hatteras, almost six years of surveys continue to provide information on the complex patterns of distribution and diversity of the marine mammals and sea turtles in this highly productive area. The current report builds on this past body of work and describes monitoring activities that occurred at the Cape Hatteras site in 2016.

2. Summary of Cape Hatteras Aerial Surveys

This document is an annual progress report to the U.S. Department of the Navy on aerial surveys conducted in the Cape Hatteras, North Carolina survey area from January through December 2016. The survey design is composed of 12 equal length tracklines running from east to west. The objective was to conduct two days of effort each month, each day flying a subset of the 12 tracklines that cover the area.

Survey effort occurred in 8 of 12 months; directed effort at the Cape Hatteras Canyon site and unfavorable weather precluded effort in January, February, April, and December. Two survey days were achieved for 6 of the 8 months, with a single day of effort occurring in June and October. A total of 89 tracklines (6,140 kilometers [km]) over 15 days was covered in the Cape Hatteras, North Carolina survey area during this reporting period.

A total of 126 sightings of 7,696 cetaceans was encountered while on effort during the 15 days of aerial surveys. Thirteen species of cetaceans were photo-documented, including bottlenose dolphins (*Tursiops truncatus*; 58 sightings for 1,296 individuals), short-finned pilot whales (*Globicephala macrorhynchus*; 31 sightings for 999 individuals), Cuvier's beaked whales (*Ziphius cavirostris*; 9 sightings for 18 individuals), Atlantic spotted dolphins (*Stenella frontalis*; 7 sightings for 376 individuals), short-beaked common dolphins (*Delphinus delphis*; 4 sighting for 4,565 individuals), sperm whales (*Physeter macrocephalus*; 3 sightings for 4 individuals), fin whales (*Balaenoptera physalus*; 3 sightings for 3 individuals), Clymene dolphins (*Stenella clymene*; 2 sightings for 385 individuals), Gervais' beaked whales (*Mesoplodon europaeus*; 2 sighting for 14 individuals), Risso's dolphins (*Grampus griseus*; 2 sightings for 5 individuals), kogiid whales (*Kogia* sp.; 1 sighting of 7 individuals), mesoplodont beaked whales (*Mesoplodon* sp.; 1 sightings of 2 individuals), and a humpback whale (*Megaptera novaeangliae*; 1 sighting of 1 individual). There were also two sightings (21 individuals) where delphinid species identity

could not be established with 100 percent certainty, and these are recorded as “unidentified delphinid.”

Four off-effort sightings were also recorded. These include one sighting of 40 Atlantic spotted dolphins, one sighting of 10 short-finned pilot whales, one sighting of a single Risso’s dolphin, and one sighting of an humpback whale inshore of our survey area. These off-effort sightings are included in species sighting maps and tables but are excluded from all other calculations.

Forty-nine sightings totaling 50 sea turtles were recorded during this survey period. Forty-six individuals were identified as loggerhead (*Caretta caretta*) and three as leatherback (*Dermochelys coriacea*) turtles. No species identification could be established for one individual, and this was listed as “unidentified sea turtle.” Sea turtles were detected during nine of 15 survey days, with highest abundances observed in August.

While survey conditions were dominated by Beaufort Sea State (BSS) 2 to 4, at times surveys were conducted in higher sea states. Other aerial surveys demonstrated that the rate of cetacean sightings is negatively affected by an increase in the BSS (e.g., Gómez de Segura et al. 2006, DeMaster et al. 2001, McAlarney et al. 2014). Effort corrected cetacean sightings this year off Cape Hatteras followed this general trend—sighting rates dropped from 53.1 to 13.1 sightings per 1,000 km as BSS increased from 1 to 4. This year, despite the low amount of effort in BSS 5, three sightings were recorded. Sea turtle sightings showed a more dramatic decrease in corrected sighting rate in seas greater than a BSS 1.

In addition to cetaceans and sea turtles, other pelagic marine vertebrates (e.g., manta rays [*Manta birostris*], cownose rays [*Rhinoptera bonasus*], ocean sunfish [*Mola mola*], and unidentified sharks) were observed. Commercial, military, and recreational vessels also were encountered in the survey area.

All historical data from this project is made publically available through the [Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations \(OBIS-SEAMAP\)](#).

3. Methods

3.1 Survey Design and Logistics

Aerial survey effort was initiated in the waters off Cape Hatteras, North Carolina, in May 2011 to assess the distribution and abundance of offshore cetacean species and sea turtles. These surveys were included in the U.S. Navy’s Atlantic Fleet Training and Testing Monitoring Program, established to document marine species that could potentially be impacted by naval activities. As this is controlled airspace, pilots must contact the Fleet Area Control and Surveillance Facility, Virginia Capes (VACAPES) the morning of planned survey flights for information on area closures or restriction. Survey plans are modified to avoid interacting with any area activities. A complete description of survey methods, including a figure with all restricted airspace in VACAPES, can be found in [McAlarney et al. \(2017\)](#).

The survey area covers 6,457 square kilometers spanning continental shelf waters, as well as deeper waters beyond the shelf break (**Table 1, Figure 1**). Placement of the survey area was designed to incorporate a large portion of the Cape Hatteras Special Research Area in support of current research assessing fishery interactions between short-finned pilot whales and the local fisheries. The Cape Hatteras, North Carolina survey area excludes coastal waters to minimize survey effort in areas where the spatial distribution and relative abundance of coastal bottlenose dolphins has previously been established (Torres et al. 2003, 2005). Twelve tracklines, ranging from 73.17 to 75.42 km in length and oriented east to west, were evenly placed across the survey area.

Table 1. Coordinates for trackline end points for the Cape Hatteras survey area.

Transect Line	Western Waypoint		Eastern Waypoint	
	Latitude (°N)	Longitude (°W)	Latitude (°N)	Longitude (°W)
45	36.122344	-75.161133	36.122344	-74.333672
44	36.048500	-75.161133	36.048500	-74.333672
43	35.978439	-75.161133	35.978439	-74.333672
42	35.906486	-75.161133	35.906486	-74.333672
41	35.832642	-75.161133	35.832642	-74.333672
40	35.762581	-75.161133	35.762581	-74.333672
39	35.690628	-75.161133	35.690628	-74.333672
38	35.620569	-75.161133	35.620569	-74.333672
37	35.550508	-75.161133	35.550508	-74.333672
36	35.480450	-75.161133	35.480450	-74.333672
35	35.410389	-75.161133	35.410389	-74.333672
34	35.340331	-75.161133	35.340331	-74.333672

Survey flights originated from the Fixed-base Operator in the Dare County Regional Airport in Manteo, North Carolina, or Signature Aviation based within the Norfolk International Airport in Norfolk, Virginia. Utilizing both airports maximized “on effort” survey time by decreasing transit time to and from the tracklines surveyed.

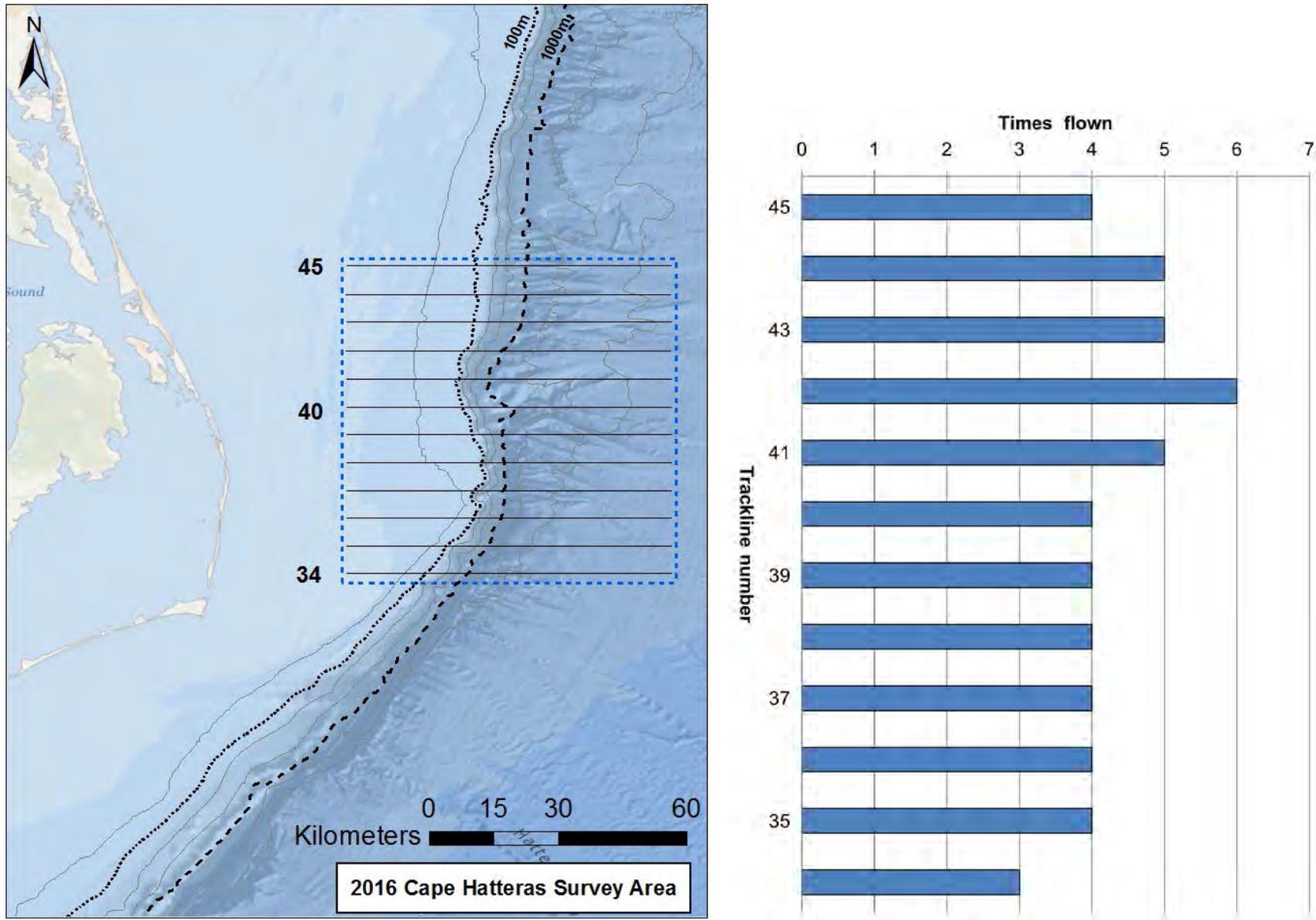


Figure 1. Survey tracklines and realized effort in the Cape Hatteras survey area for 2016.

4. Results

Eighty-nine tracklines totaling 6,140 km were surveyed in 2016 (**Table 2**). Conditions during the 15 survey days ranged from BSS 1 to 6 with nearly 65 percent of effort in sea states of BSS 3 or lower [BSS 1: 188.25 km (3.07 percent), BSS 2: 1,612.95 km (26.27 percent), BSS 3: 2,106.25 km (34.30 percent), BSS 4: 1,367.45 km (22.27 percent), BSS 5: 827.50 km (13.48 percent), BSS 6: 37.60 (<1 percent) (**Figure 2a and b**). An average BSS value, weighted by distance flown, was calculated for each month as a way to compare conditions across time (**Figure 2c**).

Table 2. Tracklines, km flown, and Hobbs hours (engine-on time) during aerial surveys of the Cape Hatteras survey area from January 2016 to December 2016. Trackline numbers are listed in the order in which they were flown.

Date	Tracklines Flown AM	Tracklines Flown PM	Total km Flown	Hobbs Hours
08-Mar-2016	45 to 40	39 to 36	727.05	6.9
09-Mar-2016		34, 35	144.05	2.0
11-May-2016	34 to 37	38, 39	441.40	6.3
12-May-2016	40, 41, 38 to 34		231.65	3.7
20-May-2016	45 to 42		295.15	2.4
11-Jun-2016		34 to 37	296.95	2.5
09-Jul-2016	45 to 42		294.50	3.4
20-Jul-2016	34 to 37	41 to 38	578.85	7.8
10-Aug-2016	34 to 37	38 to 41	571.20	6.5
11-Aug-2016	42 to 45		291.60	2.7
11-Sep-2016	34 to 37	38 to 41	597.10	5.4
12-Sep-2016	42 to 45		286.75	3.0
27-Oct-2016	38 to 41	42 to 45	506.00	5.4
02-Nov-2016	34 to 37	38 to 41	582.10	6.5
03-Nov-2016		45 to 42	295.65	2.2
15 Days	89 Tracklines		6,140.0	66.7

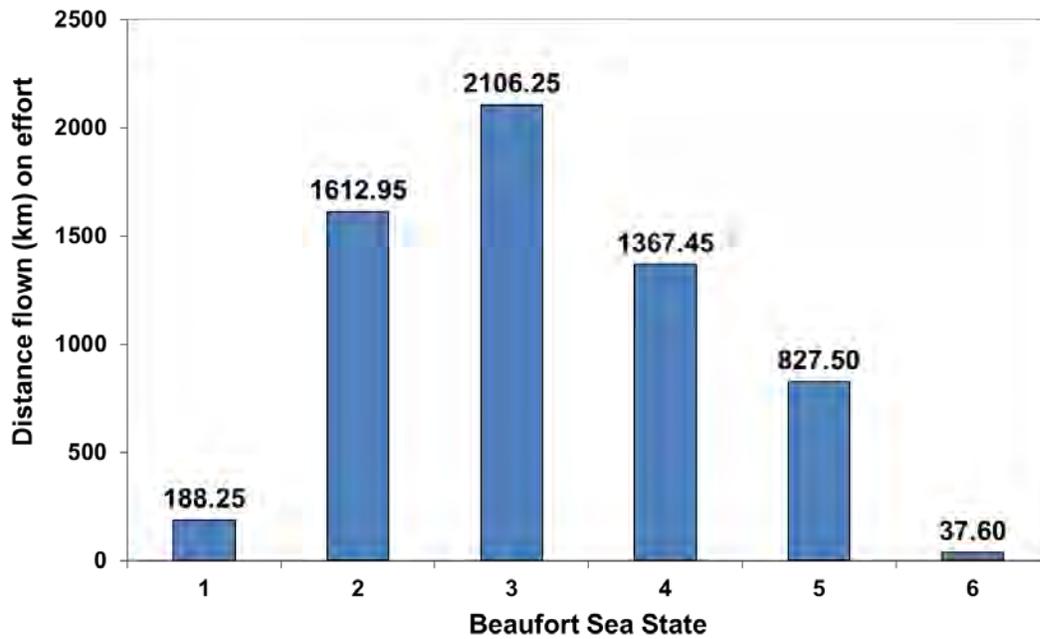


Figure 2a. Total distance surveyed per Beaufort Sea State category during aerial surveys in the Cape Hatteras survey area in 2016.

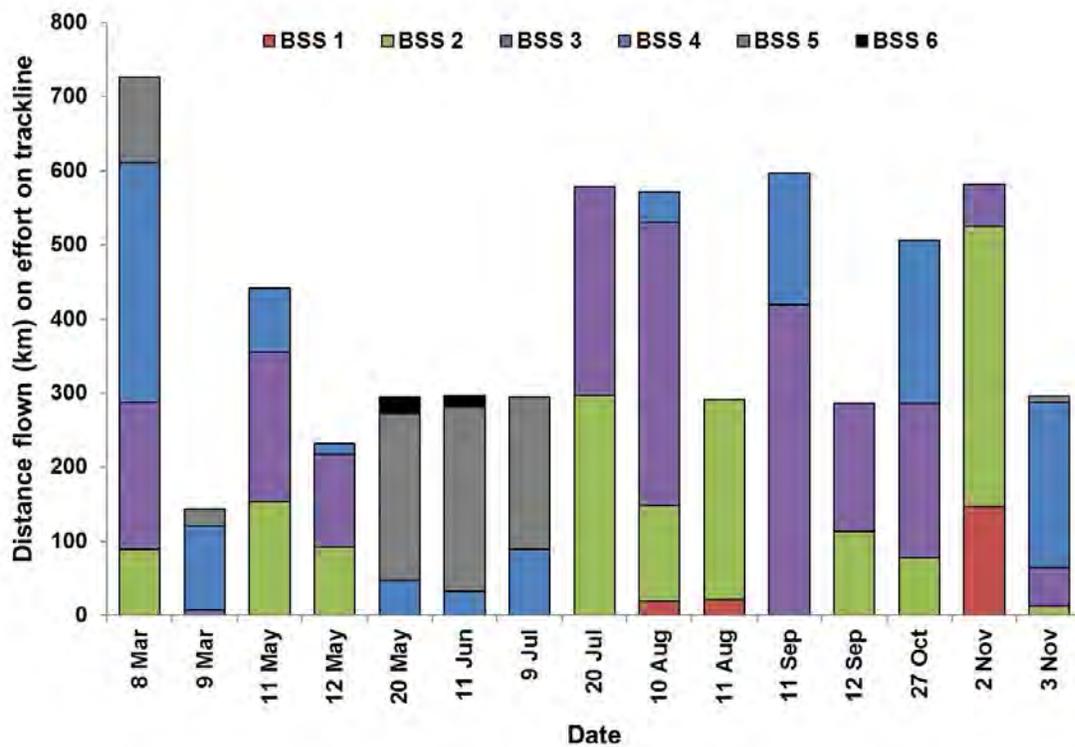


Figure 2b. Effort by Beaufort Sea State category for each survey day during aerial surveys in the Cape Hatteras survey area in 2016.

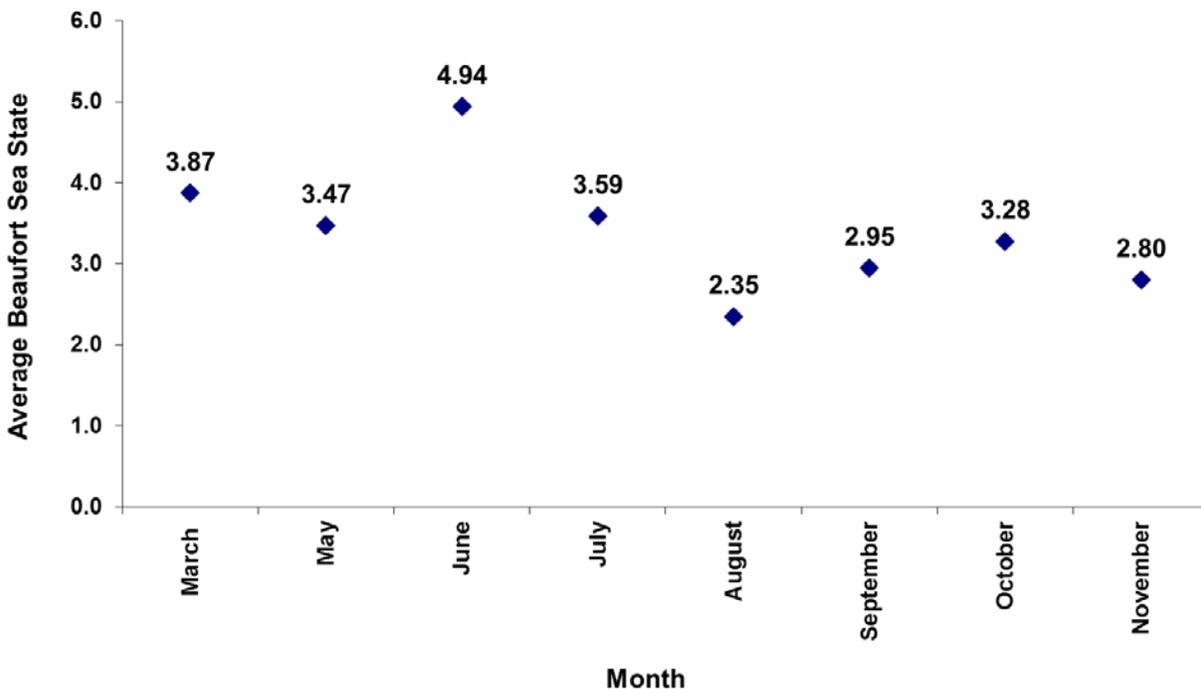


Figure 2c. Distance-weighted average BSS for each month in the Cape Hatteras survey area in 2016.

The majority of cetacean sightings (83 percent) also occurred in BSS of 3 or less (**Figure 3a**). Cetacean sighting rates decreased as BSS increased, with 53.1 sightings/1,000 km surveyed in BSS 1, 31.6 sightings/1,000 km in BSS 2, 20.9 sightings/1,000 km in BSS 3, 13.2 sightings/1,000 km in BSS 4, and 3.6 sightings/1,000 km in BSS 5 (**Figure 3b**). Sighting rates per month ranged from 3.4 to 31 sightings/1,000 km, with the highest sighting rate in May, when 17 tracklines were completed (**Figure 3c**).

Eighty-four percent of the sightings occurred within 1.2 km of the trackline (**Figure 4a**). Mean sighting distance for all cetacean sightings was 0.86 km (standard deviation [SD]=0.66). Sighting distances across sea states varied by just over 0.3 km (**Figure 4b**). Average sighting distances are normally calculated after removing outliers, defined as any value in excess of three SD from the mean (mean=0.86 km, SD=0.66, $0.86+[3 \times 0.66]=2.84$ km, outlier > 2.84 km). Two sighting distances were identified as outliers during this reporting period, both at 3.09 km in BSS 2. In addition, seven sightings did not have associated sighting distances and were excluded from these calculations. The remaining 117 sighting distances are represented in **Figures 4a and b**.

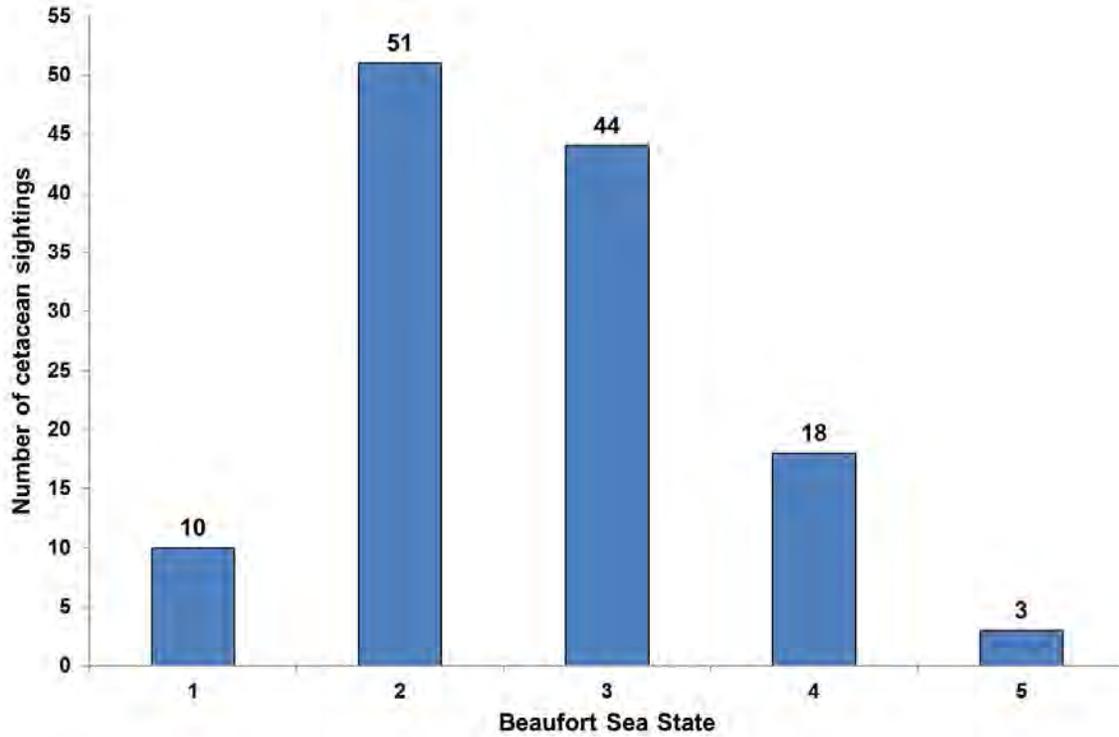


Figure 3a. Number of cetacean sightings per BSS category during aerial surveys in the Cape Hatteras survey area in 2016.

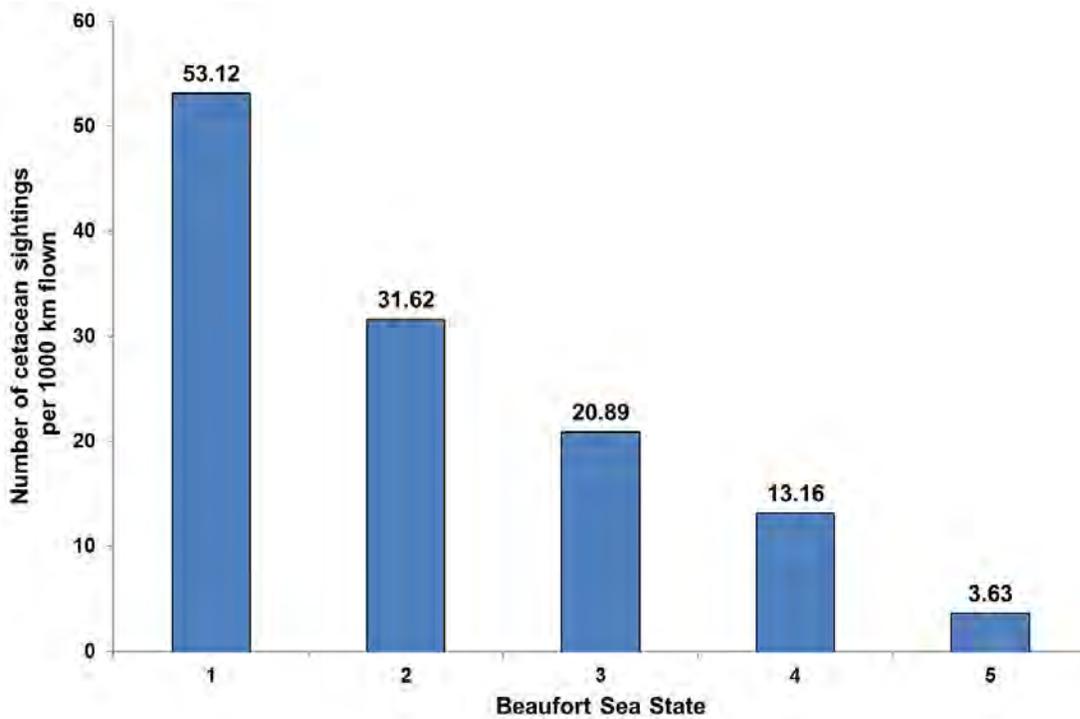


Figure 3b. Cetacean sightings per 1,000 km flown by BSS category during aerial surveys in the Cape Hatteras survey area in 2016.

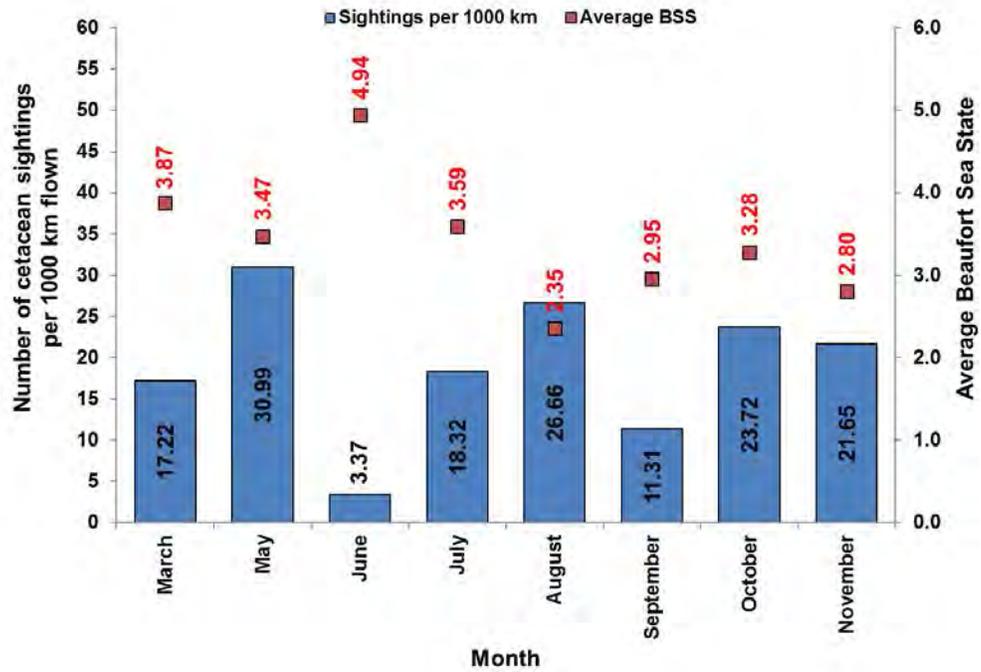


Figure 3c. Cetacean sightings per 1,000 km surveyed and the average BSS per month during aerial surveys in the Cape Hatteras survey area in 2016.

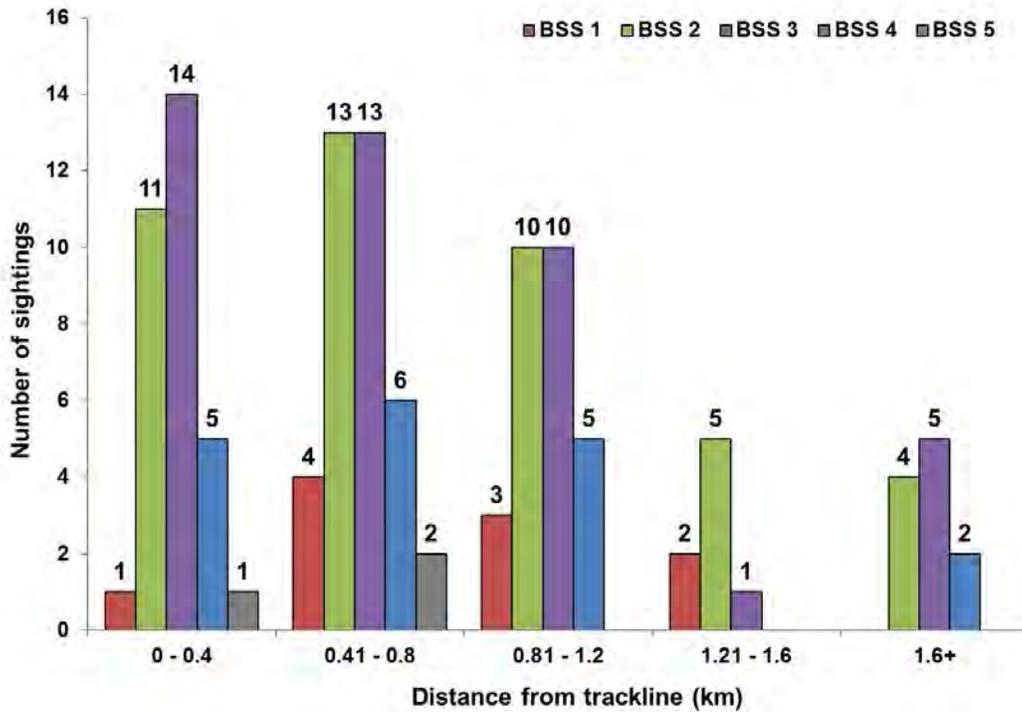


Figure 4a. Sighting distances by BSS category for 117 of 126 on-effort cetacean sightings during aerial surveys in the Cape Hatteras survey area in 2016.

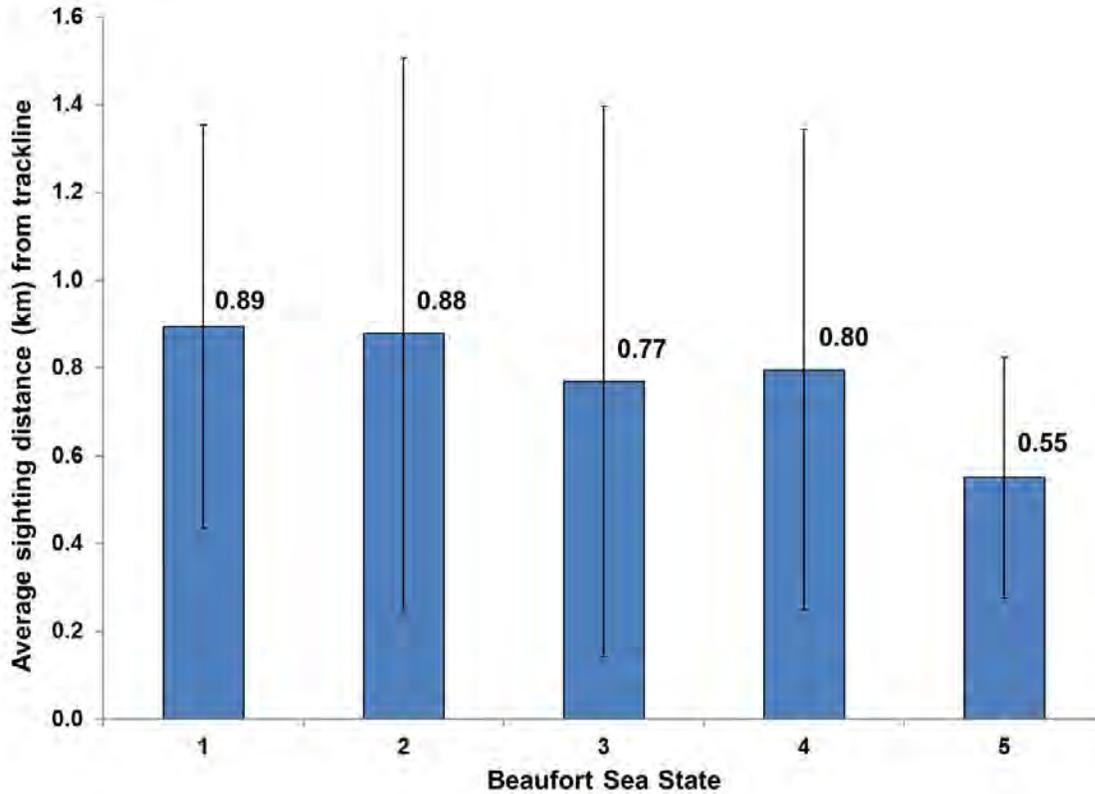


Figure 4b. Average sighting distances by BSS for 117 of 126 on-effort cetacean sightings during aerial surveys in the Cape Hatteras survey area in 2016. Error bars denote standard deviation for each category.

4.1 Marine Mammal Sightings

A total of 126 sightings of 7,696 individual cetaceans representing 13 species was observed while on effort during the reporting period (**Table 3, Figure 5**). Summary information follows below for each species individually. Two endangered species, the sperm whale and the fin whale, were encountered in the survey area. Four identified cetacean species had additional sightings that were recorded while off-effort. A sighting was considered off-effort if it occurred while transiting to or from the survey area or between tracklines. Any cetaceans the survey team encountered while investigating a separate sighting also were labeled off-effort. If two species were seen associated with the same sighting cue both were considered on-effort. The off-effort sightings are included in the tables and maps for each species but are excluded from any calculations. The total number of individuals listed represents the best estimate of group size. Information on individual sighting summaries are in **Appendices A, B, and C**. Daily sightings are summarized in **Appendix D**.

Table 3. Total numbers of on-effort sightings and individuals for each species by month for the Cape Hatteras survey area in 2016.

Species	Numbers of:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
CETACEANS														
<i>Tursiops truncatus</i>	Sightings			7		14		6	14	5	6	6		58
	Individuals			97		484		115	239	129	124	108		1,296
<i>Stenella frontalis</i>	Sightings			1				1		3		2		7
	Individuals			125				50		150		51		376
<i>Delphinus delphis</i>	Sightings			3		1								4
	Individuals			3565		1000								4,565
<i>Stenella clymene</i>	Sightings					1						1		2
	Individuals					85						300		385
<i>Grampus griseus</i>	Sightings					2								2
	Individuals					5								5
<i>Globicephala macrorhynchus</i>	Sightings			2		8		4	4		5	8		31
	Individuals			45		189		533	88		51	93		999
<i>Ziphius cavirostris</i>	Sightings					1		3	2	2	1			9
	Individuals					1		10	2	3	2			18
<i>Physeter macrocephalus</i>	Sightings					2		1						3
	Individuals					2		2						4
<i>Balaenoptera physalus</i>	Sightings			1					2					3
	Individuals			1					2					3
<i>Mesoplodon europaeus</i>	Sightings							1	1					2
	Individuals							12	2					14
<i>Kogia</i> sp.	Sightings											1		1
	Individuals											7		7
<i>Mesoplodon</i> sp.	Sightings					1								1
	Individuals					2								2
<i>Megaptera novaeangliae</i>	Sightings			1										1
	Individuals			1										1
Unidentified delphinid	Sightings						1					1		2
	Individuals						10					11		21
Total	Total sightings			15		30	1	16	23	10	12	19		126
	Total individuals			3,834		1,768	10	722	333	282	177	570		7,696
SEA TURTLES														
<i>Caretta caretta</i>	Sightings					8		8	16		2	11		45

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Species	Numbers of:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
<i>Dermochelys coriacea</i>	Individuals					9		8	16		2	11		46
	Sightings											3		3
	Individuals											3		3
Unidentified sea turtle	Sightings								1					1
	Individuals								1					1
Total	Total sightings					8		8	17		2	14		49
	Total individuals					9		8	17		2	14		50

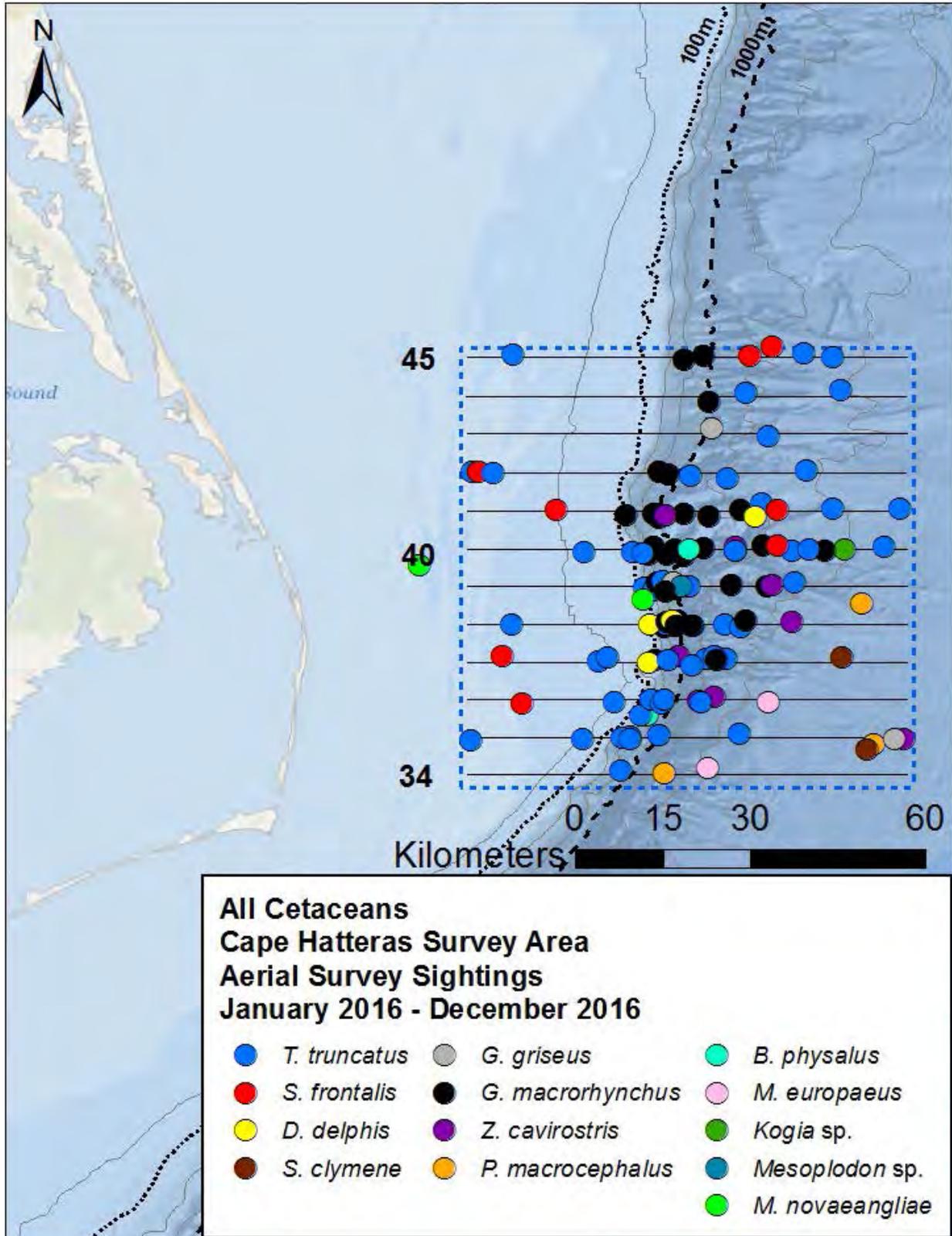


Figure 5. All cetacean sightings during aerial surveys conducted in the Cape Hatteras survey area in 2016.

4.2 Dolphins

4.2.1 Bottlenose dolphin (*Tursiops truncatus*)

This species was the most commonly observed cetacean species, with 58 on-effort sightings totaling 1,296 individuals (**Table 4, Figure 6**). Bottlenose dolphins were observed in seven of eight months in which survey effort was conducted this reporting period, with groups ranging in size between 1 and 125 individuals (mean=22.3, SD=21.5). The majority of sightings occurred further than 37 km from shore and in waters beyond the 100-m isobath. Based on the distance from shore (i.e., greater than 34 km), most of these bottlenose dolphins were likely the offshore ecotype (Torres et al. 2003).

Table 4. Bottlenose dolphin (*Tursiops truncatus*) sightings in the Cape Hatteras survey in 2016.

Date	Time	Way Point	Latitude (°N)	Longitude (°W)	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
08-Mar-2016	10:46:57	17	35.904140	-75.113762	42	3	1	90°	20	
08-Mar-2016	10:54:05	21	35.907115	-75.152278	42	2	2	45°	8	
08-Mar-2016	11:45:45	34	35.760365	-74.520540	40	4	2	90°	12	
08-Mar-2016	12:04:57	41	35.758038	-74.658011	40	4	1	90°	30	
08-Mar-2016	15:44:26	87	35.621575	-75.078776	38	3	2	90°	18	
09-Mar-2016	14:46:35	53	35.345574	-74.874131	34	3	2	100°	4	
09-Mar-2016	15:27:44	61	35.412662	-74.802465	35	4	2	100°	5	
11-May-2016	10:18:10	16	35.405698	-74.856217	35	4	3	90°	10	
11-May-2016	10:41:47	22	35.403096	-75.154364	35	2	1	90°	16	
11-May-2016	11:16:18	32	35.475495	-74.817099	36	2	3	60°	1	
11-May-2016	11:18:51	36	35.480930	-74.791223	36	4	4	90°	125	
11-May-2016	11:30:12	40	35.474951	-74.721885	36	4	2	60°	25	
11-May-2016	11:55:44	46	35.543343	-74.739988	37	4	3	90°	40	
11-May-2016	12:05:26	51	35.553318	-74.783131	37	4	2	45°	65	
11-May-2016	14:53:03	73	35.628505	-74.766254	38	2	1	45°	35	
11-May-2016	14:55:58	76	35.617345	-74.740073	38	2	2	60°	75	
11-May-2016	15:40:47	95	35.692026	-74.744156	39	2	1	100°	1	
11-May-2016	15:52:49	100	35.694851	-74.769897	39	2	1	90°	15	
11-May-2016	16:08:18	106	35.685165	-74.811789	39	2	1	90°	20	
11-May-2016	16:24:34	117	35.689577	-74.828139	39	2	2	90°	40	
12-May-2016	13:56:44	30	35.555604	-74.675995	37	3	1	90°	16	
20-Jul-2016	10:37:48	21	35.473633	-74.796467	36	3	1	90°	4	
20-Jul-2016	14:21:34	58	35.848821	-74.609718	41	3	4	45°	30	
20-Jul-2016	14:47:26	67	35.758046	-74.553086	40	3	1	90°	4	
20-Jul-2016	15:23:29	79	35.701961	-74.793453	39	2	3	100°	25	
20-Jul-2016	15:49:44	86	35.616305	-74.649396	38	2	1	90°	45	

Date	Time	Way Point	Latitude (°N)	Longitude (°W)	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
20-Jul-2016	15:54:26	90	35.620159	-74.678029	38	2	1	90°	7	
10-Aug-2016	9:45:15	10	35.415232	-74.651861	35	3	1	90°	3	
10-Aug-2016	9:54:52	16	35.410740	-74.856517	35	2	1	90°	7	
10-Aug-2016	10:04:23	20	35.406584	-74.944822	35	2	2	100°	3	
10-Aug-2016	10:36:32	31	35.449534	-74.835930	36	2	3	60°	12	
10-Aug-2016	10:42:55	35	35.478928	-74.816545	36	2	3	100°	12	
10-Aug-2016	11:24:10	45	35.562435	-74.698614	37	3	2	60°	28	
10-Aug-2016	11:35:57	54	35.559292	-74.897721	37	3	2	90°	12	
10-Aug-2016	14:09:27	64	35.621665	-74.789742	38	3	1	90°	12	
10-Aug-2016	15:18:51	79	35.758379	-74.658529	40	3	1	90°	16	
10-Aug-2016	15:38:56	84	35.765282	-74.378965	40	3	1	90°	22	
11-Aug-2016	8:58:59	10	35.900608	-74.742692	42	2	1	90°	18	
11-Aug-2016	9:03:47	15	35.894222	-74.673056	42	2	2	100°	6	
11-Aug-2016	10:16:18	38	36.120853	-74.476147	45	1	1	45°	28	
11-Aug-2016	10:20:56	42	36.128048	-74.529440	45	1	1	90°	60	
11-Sep-2016	14:29:29	40	35.837068	-74.348722	41	4	1	100°	45	
11-Sep-2016	14:51:56	46	35.837273	-74.475531	41	4	1	90°	14	
12-Sep-2016	9:48:36	18	35.972860	-74.597093	43	2	2	100°	25	
12-Sep-2016	10:29:28	29	36.055836	-74.637831	44	2	3	100°	5	
12-Sep-2016	10:38:07	33	36.059184	-74.461430	44	2	3	90°	40	
27-Oct-2016	9:18:13	5	35.618396	-74.771810	38	2	1	90°	12	
27-Oct-2016	9:57:32	17	35.699089	-74.548408	39	3	1	90°	12	
27-Oct-2016	10:34:53	29	35.757280	-74.941602	40	3	1	90°	16	
27-Oct-2016	10:41:41	33	35.754603	-74.830978	40	3	2	90°	45	
27-Oct-2016	13:41:27	60	35.910275	-74.524409	42	4	1	90°	24	
27-Oct-2016	14:57:26	78	36.127098	-75.074706	45	4	1	100°	15	
02-Nov-2016	10:02:56	12	35.407536	-74.869685	35	3	2	100°	1	
02-Nov-2016	10:41:49	24	35.475115	-74.884554	36	2	1	90°	16	
02-Nov-2016	11:21:36	36	35.556899	-74.712916	37	2	1	45°	45	
02-Nov-2016	11:31:57	44	35.552492	-74.915997	37	2	1	90°	25	
02-Nov-2016	14:09:51	74	35.619404	-74.736401	38	1	1	70°	4	
02-Nov-2016	15:11:46	100	35.755295	-74.850638	40	1	1	90°	17	

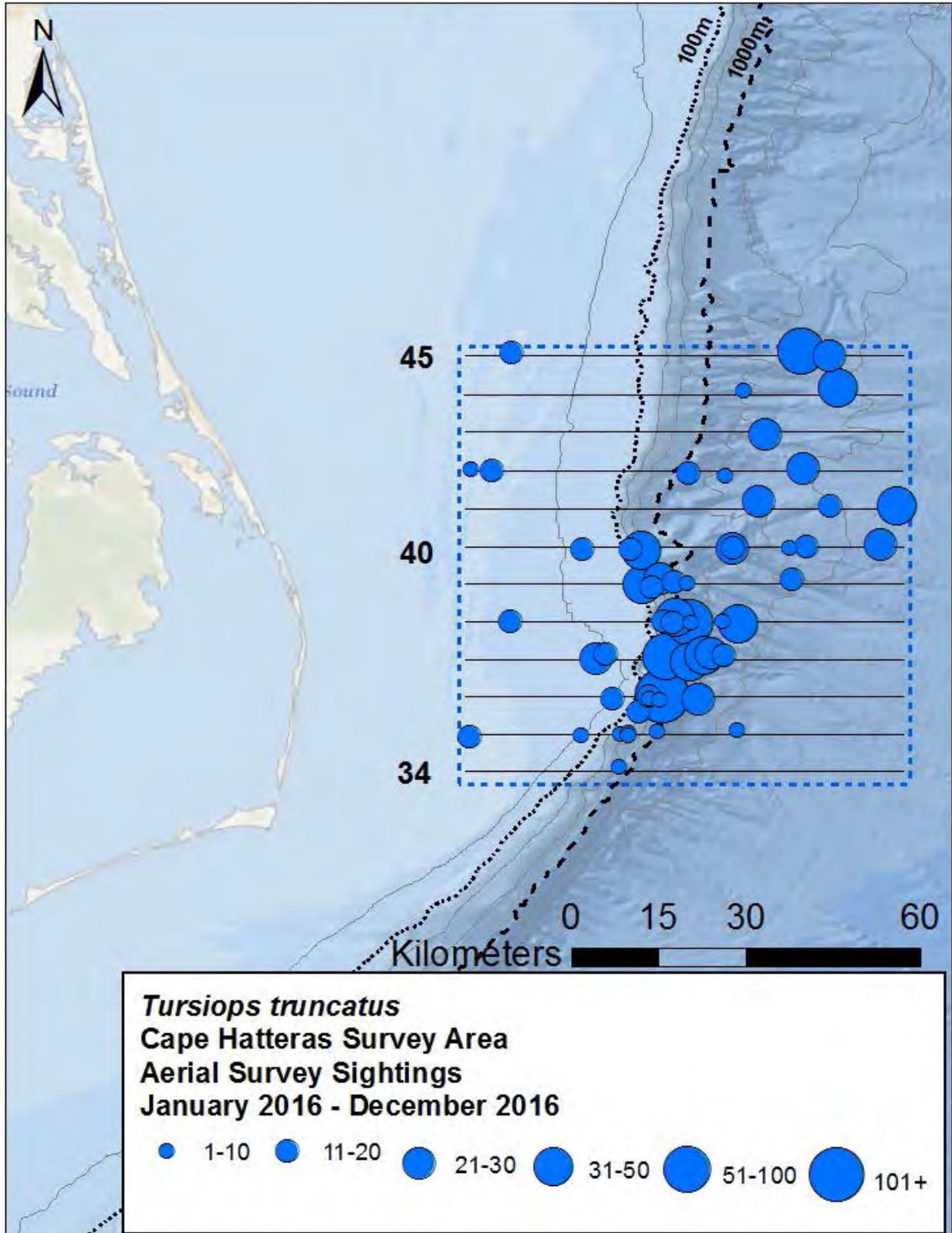


Figure 6. Bottlenose dolphin (*Tursiops truncatus*) sightings in the Cape Hatteras survey area in December 2016 (N=58). Symbol size indicates group size.

4.2.2 Atlantic spotted dolphin (*Stenella frontalis*)

Seven sightings totaling 376 individuals were recorded while on effort in the Cape Hatteras survey area. Group size ranged from 15 to 125 individuals (mean=53.7, SD=42.5) (**Table 5, Figure 7**). This species was observed in four of eight months surveyed. One additional off-effort sighting occurred inside the survey area. There are two distinct forms, or ecotypes, of the Atlantic spotted dolphin in the western North Atlantic: a heavily spotted, larger form that typically occurs on the continental shelf and is most often encountered around the 200-m isobath or in shallower water, and a less spotted and smaller form that occurs farther offshore and around islands (Perrin et al. 1987, 1994). Examination of photos collected during each sighting suggests that both ecotypes are present within the Cape Hatteras survey area.

Table 5. Atlantic spotted dolphin (*Stenella frontalis*) sightings in the Cape Hatteras survey area in 2016. Asterisk denotes off-effort sightings.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
8-Mar-2016	11:57:41	38	35.767769	-74.580143	40	4	3	60°	125	
20-Jul-2016	13:53:12	42	35.835383	-74.994572	41	2	3	60°	50	
20-Jul-2016	14:28:22	61	35.836423	-74.579635	41	3	1	90°	40	*
12-Sep-2016	9:04:44	4	35.906950	-75.140172	42	3	1	90°	35	
12-Sep-2016	11:01:24	40	36.141453	-74.588563	45	3	4	100°	100	
12-Sep-2016	11:11:53	44	36.125405	-74.631275	45	3	3	120°	15	
02-Nov-2016	10:22:50	18	35.471915	-75.058017	36	2	2	120°	16	
02-Nov-2016	11:38:27	51	35.561177	-75.094562	37	2	2	60°	35	

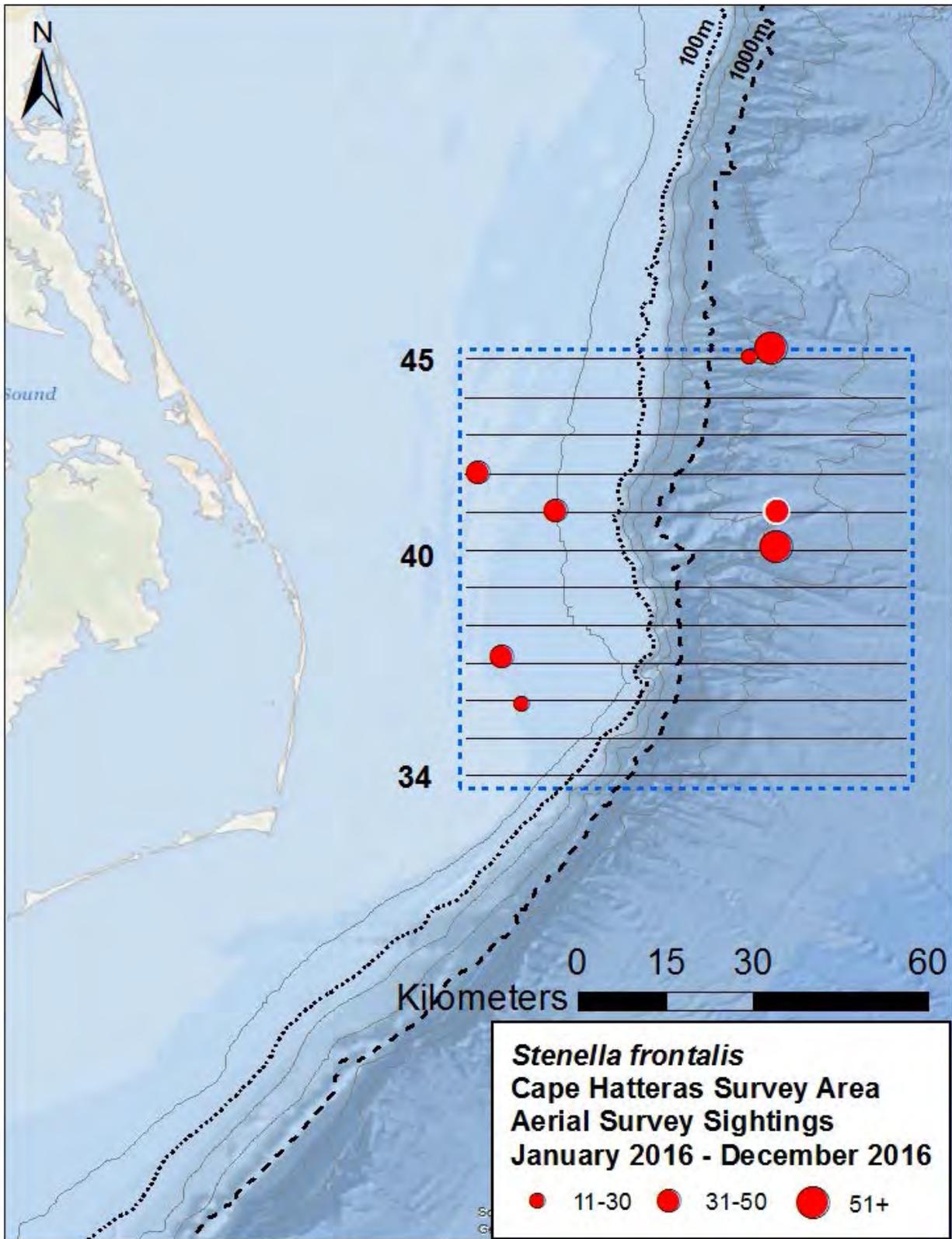


Figure 7. Atlantic spotted dolphin (*Stenella frontalis*) sightings in the Cape Hatteras survey area in 2016 (N=8). Symbol size indicates group size. White outline denotes off-effort sightings.

4.2.3 Short-beaked common dolphin (*Delphinus delphis*)

Four short-beaked common dolphin sightings totaling 4,565 individuals were recorded from inshore of the 50-m isobath to seaward of the 1,500-m isobath (**Table 6, Figure 8**). Group sizes were highly variable; two groups had fewer than 60 animals, while the two other groups contained 1,000 and 3,500 individuals (mean=1,141.3, SD=1,637.4).

Table 6. Short-beaked common dolphin (*Delphinus delphis*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
08-Mar-2016	11:21:05	28	35.824015	-74.620852	41	4	4	40°	3,500	
08-Mar-2016	15:24:02	75	35.628641	-74.775626	38	3	3	60°	55	
08-Mar-2016	15:33:51	83	35.620141	-74.818595	38	3	3	120°	10	
11-May-2016	12:10:15	55	35.550182	-74.820067	37	2	1	45°	1,000	

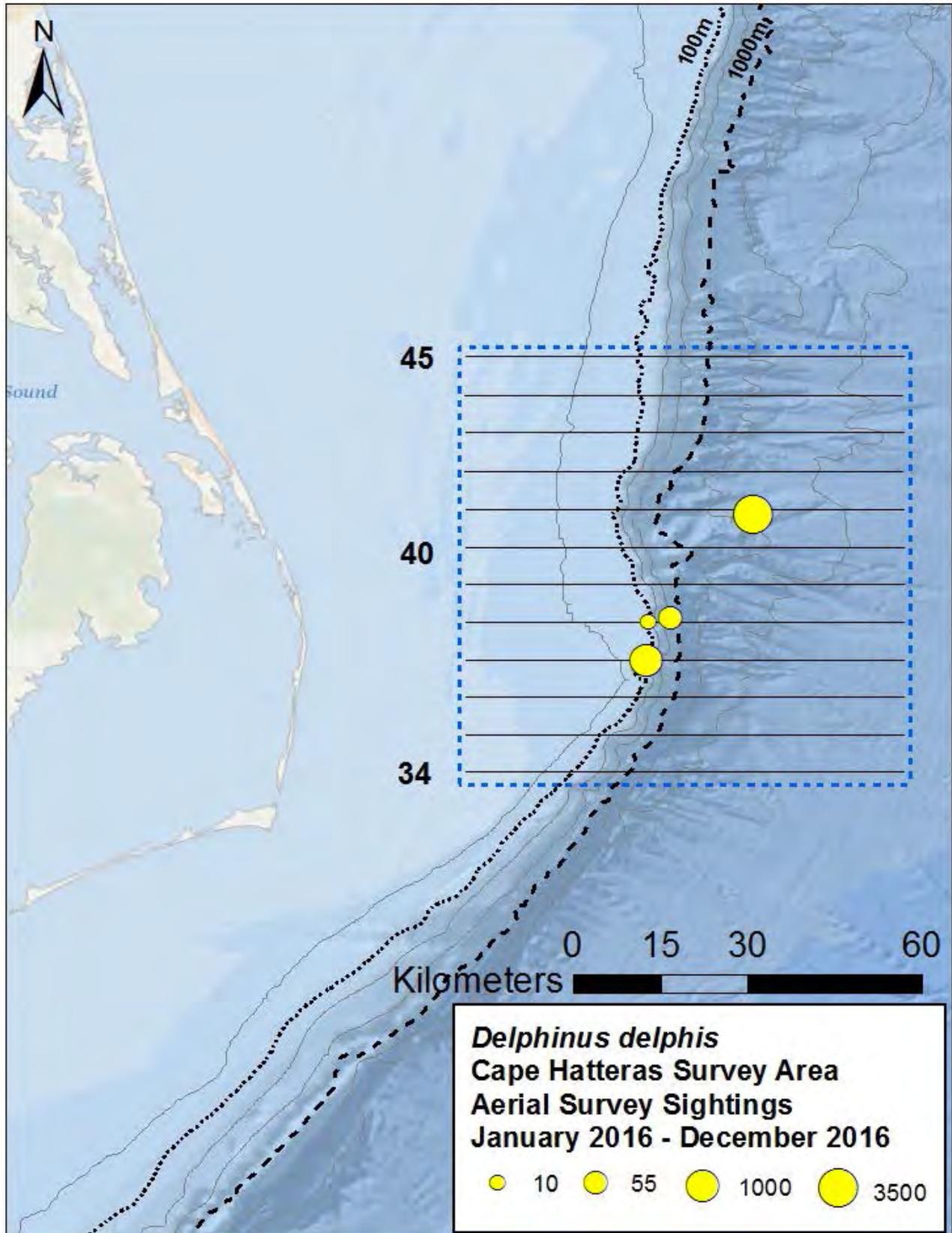


Figure 8. Short-beaked common dolphin (*Delphinus delphis*) sightings in the Cape Hatteras survey area in 2016 (N=4). Symbol size indicates group size.

4.2.4 Clymene dolphin (*Stenella clymene*)

Two sightings totaling 385 individuals were recorded seaward of the 2,000-m isobath in the southern portion of the Cape Hatteras survey area. Two groups of 85 and 300 individuals were observed (mean=192.5, SD=152.0) (Table 7, Figure 9).

Table 7. Clymene dolphin (*Stenella clymene*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
12-May-2016	14:51:18	42	35.386402	-74.410363	35	2	4	90°	85	
02-Nov-2016	11:03:39	32	35.558448	-74.459414	37	2	2	90°	300	

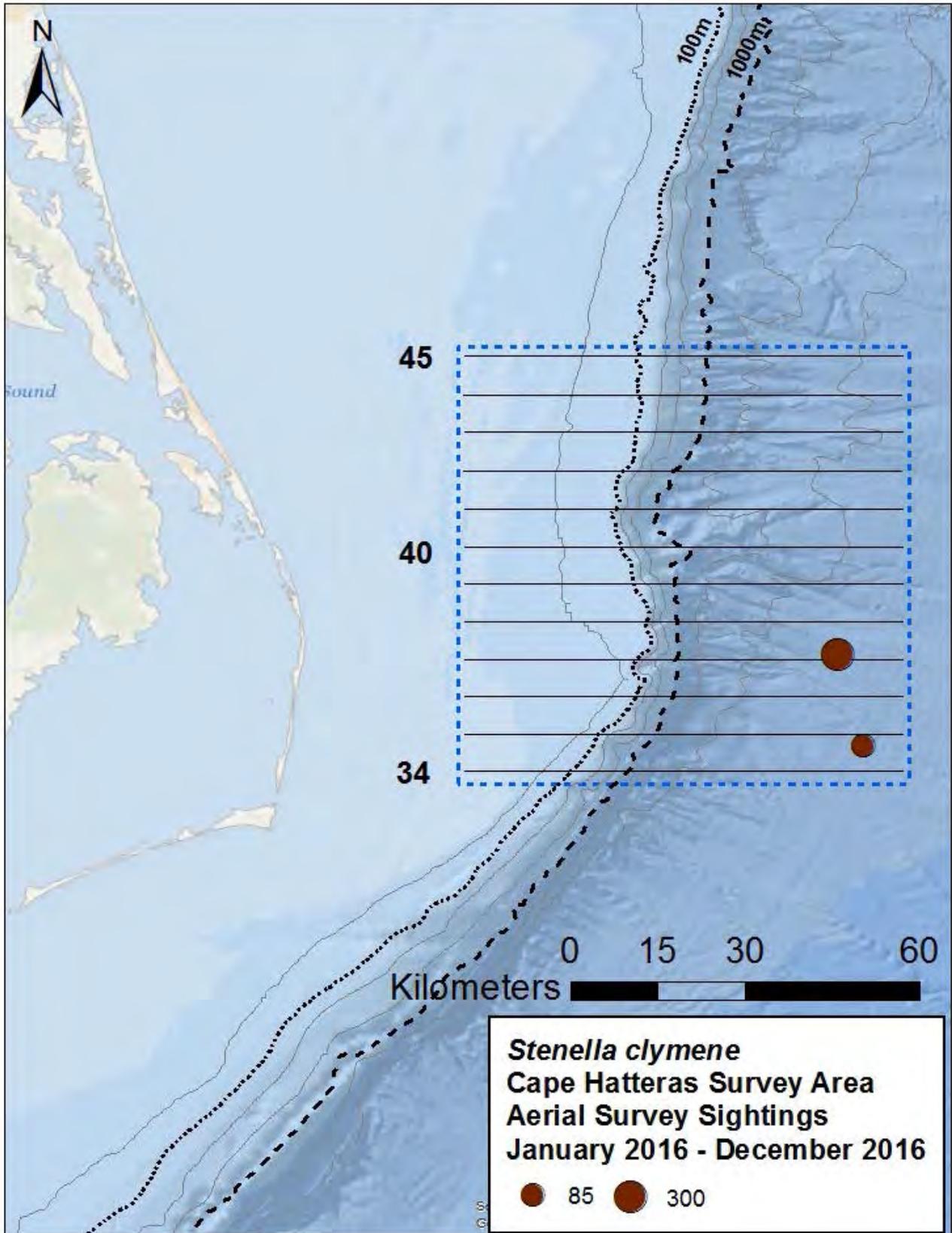


Figure 9. Clymene dolphin (*Stenella clymene*) sightings in the Cape Hatteras survey area in 2016 (N=2). Symbol size indicates group size.

4.2.5 Risso's dolphin (*Grampus griseus*)

Risso's dolphins were encountered twice while on effort for a total of five individuals, with one additional off-effort sighting of one individual. Group sizes ranged from 1 to 3 individuals (mean=2.0, SD=1.0) (Table 8, Figure 10). Sightings occurred at or beyond the 1,000-m isobath.

Table 8. Risso's dolphin (*Grampus griseus*) sightings in the Cape Hatteras survey area in 2016. Asterisk denotes off-effort sightings.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
11-May-2016	9:59:26	12	35.407067	-74.360518	35	4	1	90°	3	
11-May-2016	15:54:22	101	35.700041	-74.773654	39	2	1	90°	2	
27-Oct-2016	14:02:25	67	35.988824	-74.703305	43	4	1	90°	1	*

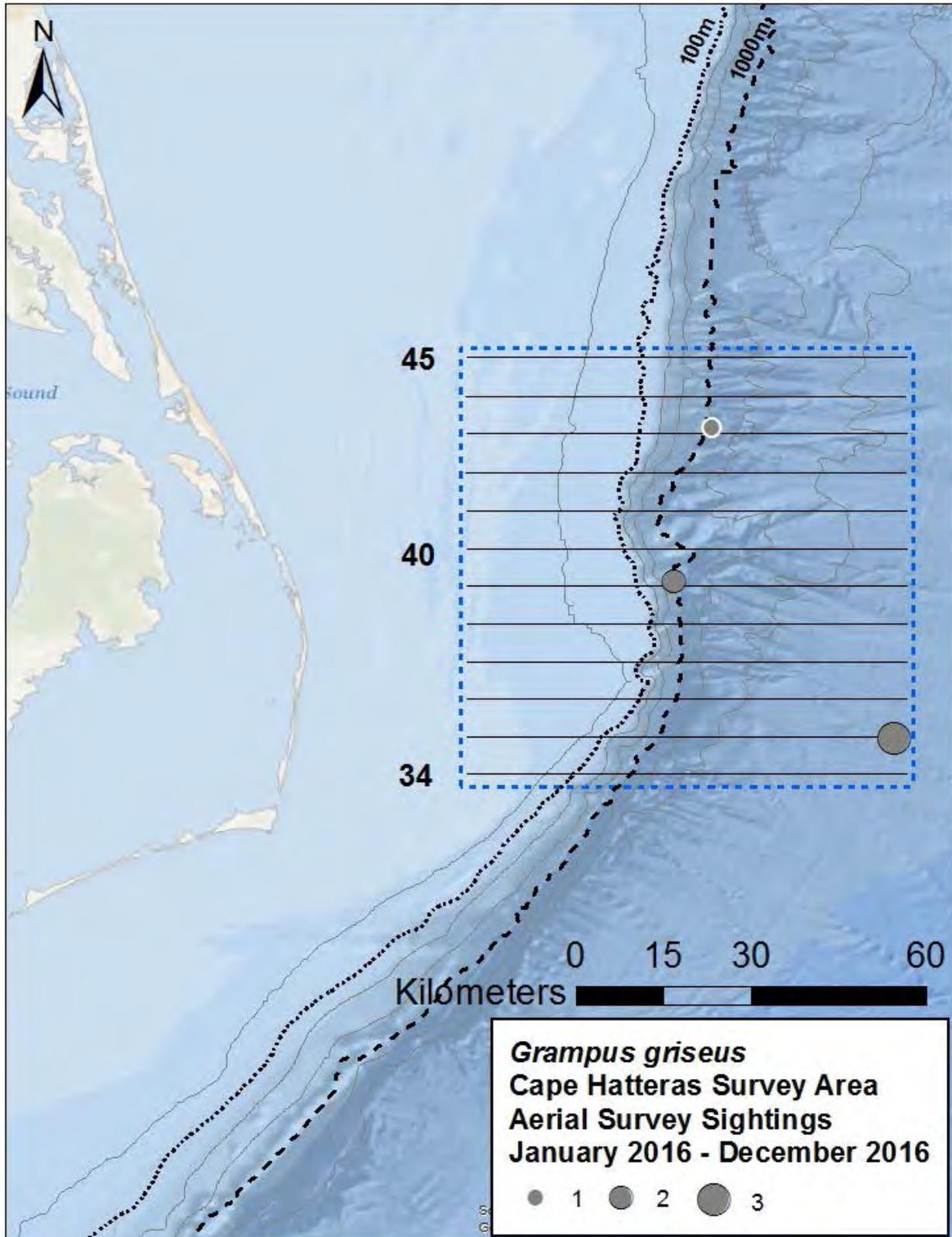


Figure 10. Risso's dolphin (*Grampus griseus*) sightings in the Cape Hatteras survey area in December 2016 (N = 3). Symbol size indicates group size. White outline denotes off-effort sighting.

4.3 Whales

4.3.1 Short-finned pilot whale (*Globicephala macrorhynchus*)

Short-finned pilot whales were observed on effort 31 times for a total of 999 individuals. This species was seen in six of the eight months in which surveys were conducted. Group sizes ranged from 2 to 500 individuals (mean=31.5, SD=86.8) (**Table 9**). One off-effort sighting of 10 individuals was made while in the Cape Hatteras survey area. Sightings of short-finned pilot whales in the western North Atlantic occur primarily near the continental shelf break (Waring et al. 2014, and sightings in the Cape Hatteras survey area followed this pattern. Short-finned pilot whales were observed from the 100-m isobath to waters greater than 2,000 m in depth (**Figure 11**). The geographic extent of our survey area encompasses waters shared by both species of *Globicephala* (summarized in Waring et al. 2016). A careful examination of all photos suggests that all sightings were of short-finned pilot whales.

Table 9. Short-finned pilot whale (*Globicephala macrorhynchus*) sightings in the Cape Hatteras survey area in 2016. Asterisk denotes off-effort sightings.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
08-Mar-2016	15:18:56	71	35.619414	-74.740556	38	3	1	45°	15	
08-Mar-2016	15:25:55	79	35.624948	-74.786197	38	3	1	100°	30	
11-May-2016	14:53:03	73	35.628505	-74.766254	38	2	3	120°	16	
11-May-2016	15:01:34	81	35.628698	-74.638835	38	3	3	90°	2	
11-May-2016	15:31:41	91	35.695457	-74.664534	39	2	1	90°	18	
11-May-2016	15:45:55	99	35.698572	-74.803952	39	2	1	90°	85	
11-May-2016	16:12:14	107	35.682919	-74.789942	39	2	3	90°	20	
12-May-2016	12:35:22	5	35.767292	-74.812490	40	2	3	90°	25	
12-May-2016	12:44:10	9	35.751889	-74.785531	40	2	3	120°	15	
12-May-2016	13:43:54	26	35.553318	-74.693522	37	3	2	100°	8	
09-Jul-2016	9:26:15	9	36.038578	-74.708082	44	5	2	90°	15	
09-Jul-2016	10:25:56	22	35.901275	-74.784248	42	5	1	90°	8	
20-Jul-2016	14:01:29	47	35.826651	-74.862837	41	2	1	60°	500	
20-Jul-2016	14:08:50	52	35.827393	-74.754764	41	2	1	90°	10	
10-Aug-2016	15:08:50	75	35.751160	-74.820130	40	3	1	90°	15	
11-Aug-2016	8:53:50	5	35.906693	-74.801032	42	2	2	90°	6	
11-Aug-2016	10:30:09	45	36.124604	-74.716597	45	2	2	90°	17	
11-Aug-2016	10:34:12	49	36.117109	-74.754044	45	2	2	90°	50	
27-Oct-2016	9:26:01	7	35.617001	-74.769192	38	2	1	90°	10	*
27-Oct-2016	10:05:16	21	35.691125	-74.599049	39	3	1	90°	4	
27-Oct-2016	10:46:17	37	35.761629	-74.770999	40	3	1	90°	16	
27-Oct-2016	10:54:19	41	35.768228	-74.607360	40	3	3	90°	11	

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
27-Oct-2016	10:59:12	45	35.757904	-74.489487	40	3	2	100°	8	
27-Oct-2016	11:19:37	51	35.827873	-74.812117	41	3	2	100°	12	
02-Nov-2016	11:26:34	40	35.554665	-74.808430	37	2	1	90°	10	
02-Nov-2016	14:03:47	70	35.616718	-74.791111	38	1	1	90°	14	
02-Nov-2016	14:37:49	81	35.688038	-74.771537	39	1	3	160°	16	
02-Nov-2016	15:20:12	104	35.749853	-74.753684	40	1	2	60°	18	
02-Nov-2016	15:24:52	108	35.764113	-74.717716	40	1	3	120°	3	
02-Nov-2016	16:04:38	122	35.834404	-74.648762	41	2	1	45°	8	
02-Nov-2016	16:11:48	126	35.822476	-74.707388	41	1	1	90°	15	
02-Nov-2016	16:15:33	131	35.820557	-74.801935	41	1	2	110°	9	

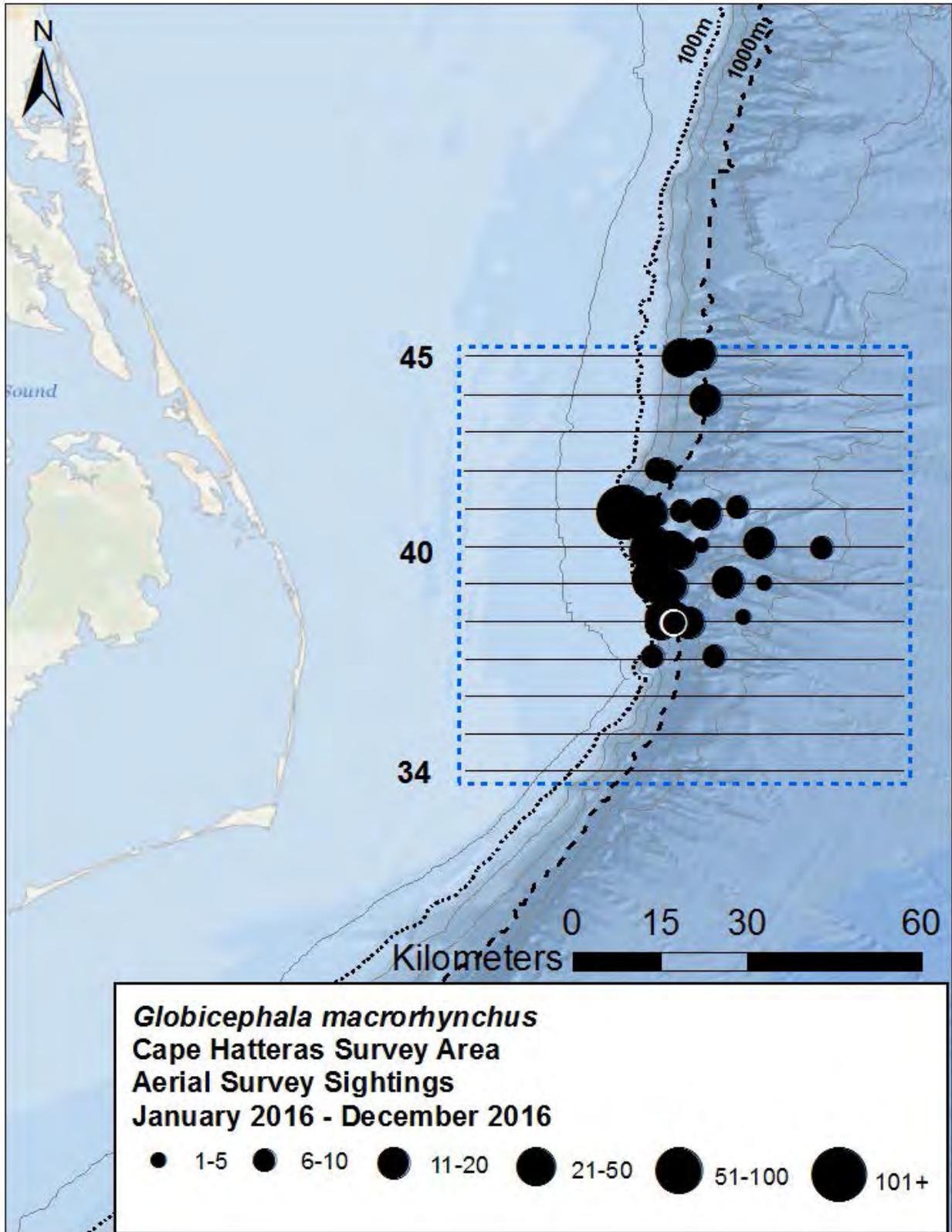


Figure 11. Short-finned pilot whale (*Globicephala macrorhynchus*) sightings in the Cape Hatteras survey area in 2016 (N=32). Symbol size indicates group size. White outlines denote off-effort sighting.

4.3.2 Cuvier's beaked whale (*Ziphius cavirostris*)

Nine sightings totaling 18 individuals occurred while on effort in the Cape Hatteras survey area, and this species was observed in five of the eight months in which surveys were conducted (Table 10, Figure 12). Group sizes ranged from single animals to as many as seven individuals. Sightings occurred from just inshore of the 1,000-m isobath to beyond the 2,000-m isobath.

Table 10. Cuvier's beaked whale (*Ziphius cavirostris*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
11-May-2016	9:56:55	8	35.405117	-74.342950	35	4	2	90°	1	
20-Jul-2016	10:43:11	25	35.478192	-74.726763	36	3	2	90°	7	
20-Jul-2016	14:54:37	71	35.767475	-74.657636	40	3	2	45°	1	
20-Jul-2016	15:58:56	94	35.626377	-74.763815	38	2	2	90°	2	
10-Aug-2016	11:27:41	49	35.560476	-74.764666	37	3	1	45°	1	
10-Aug-2016	16:00:38	91	35.824700	-74.790320	41	3	2	90°	1	
11-Sep-2016	10:24:32	15	35.484442	-74.697859	36	3	2	120°	1	
11-Sep-2016	13:44:34	30	35.694374	-74.588224	39	4	1	60°	2	
27-Oct-2016	9:34:13	11	35.625555	-74.553026	38	3	2	90°	2	

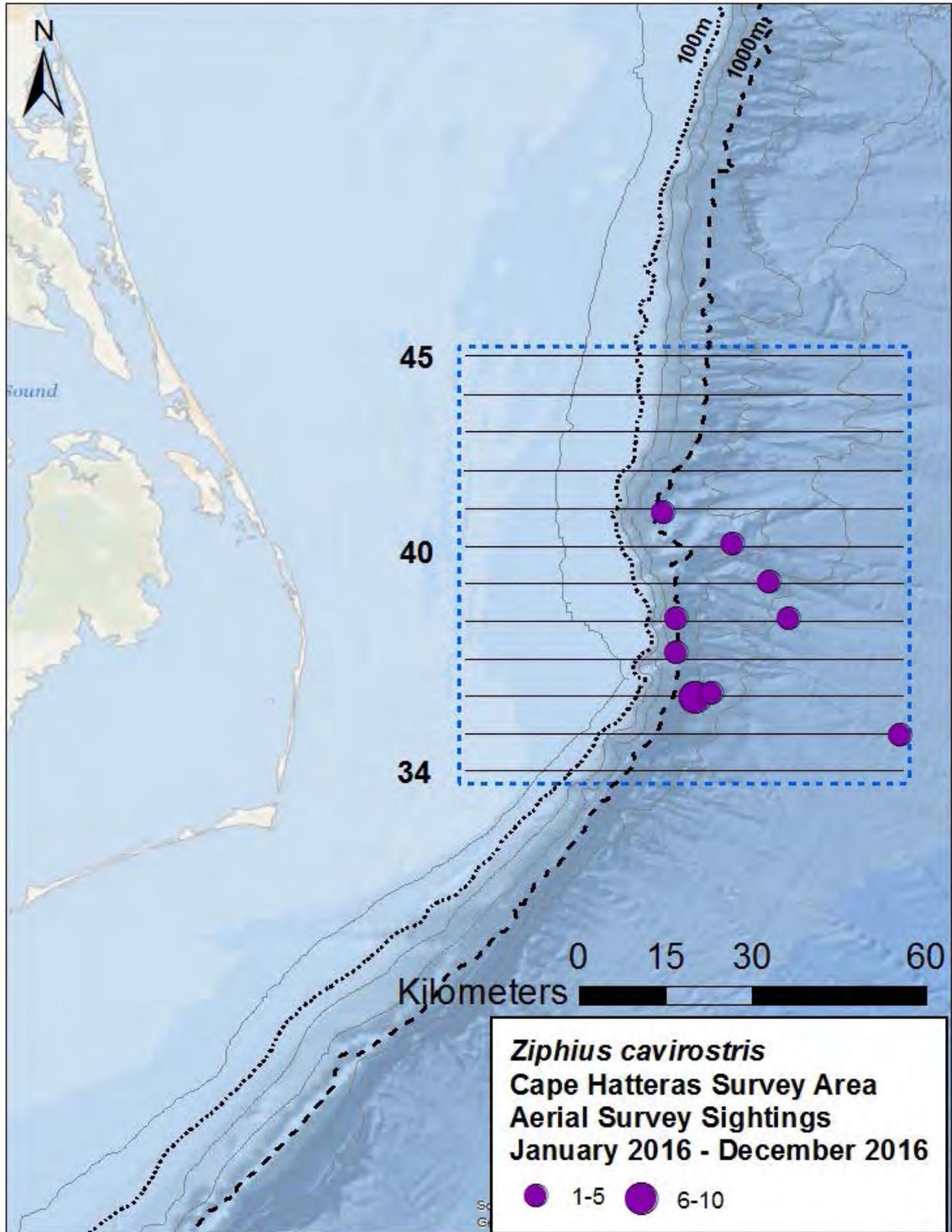


Figure 12. Cuvier's beaked whale (*Ziphius cavirostris*) sightings in the Cape Hatteras survey area in 2016 (N=9). Symbol size indicates group size.

4.3.3 Sperm whale (*Physeter macrocephalus*)

On three occasions, sperm whales were observed—two sightings were of single whales and one sighting was of two individuals. All sightings were beyond the 1,000-m isobath in the southern portion of the Cape Hatteras survey area (**Table 11, Figure 13**).

Table 11. Sperm whale (*Physeter macrocephalus*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
11-May-2016	15:23:37	87	35.660683	-74.420553	39	3	4	40°	1	
12-May-2016	14:43:52	41	35.395043	-74.399625	35	2	4	90°	1	
20-Jul-2016	9:34:44	5	35.340601	-74.792767	34	3	1	45°	2	

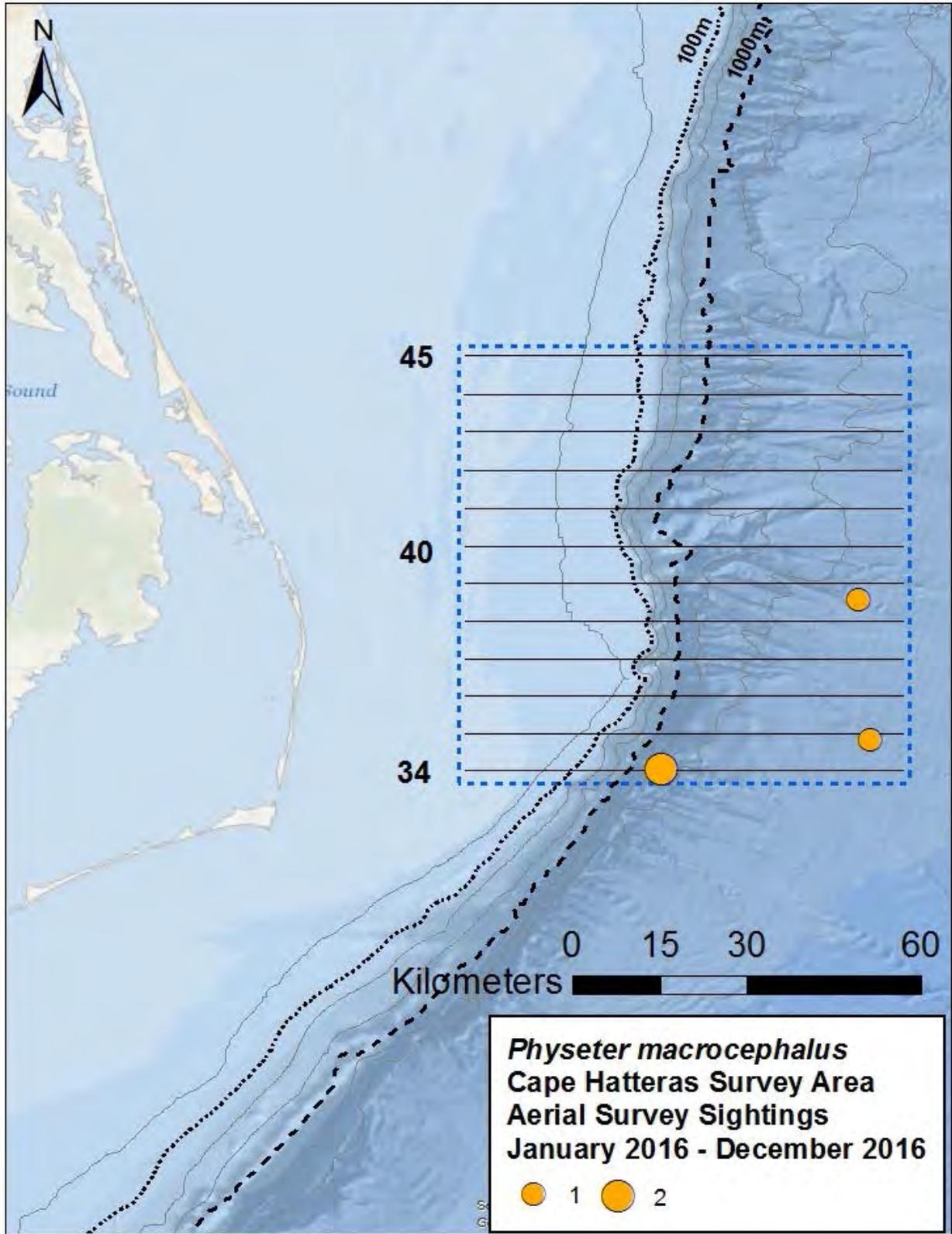


Figure 13. Sperm whale (*Physeter macrocephalus*) sightings in the Cape Hatteras survey area in 2016 (N=3). Symbol size indicates group size.

4.3.4 Fin whale (*Balaenoptera physalus*)

Three sightings of individual fin whales were recorded beyond the 100-m isobath in the southern half of the Cape Hatteras survey area (**Table 12, Figure 14**). During both sightings on 10 August 2016, fin whales were seen in a mixed-species association with bottlenose dolphins. Images from both of these fin whale sightings were analyzed and determined to be of two separate individuals.

Table 12. Fin whale (*Balaenoptera physalus*) sighting in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
08-Mar-2016	12:12:07	45	35.762281	-74.744448	40	4	2	90°	1	
10-Aug-2016	10:27:48	30	35.451163	-74.824753	36	2	3	60°	1	
10-Aug-2016	14:10:17	65	35.623118	-74.790968	38	3	3	90°	1	

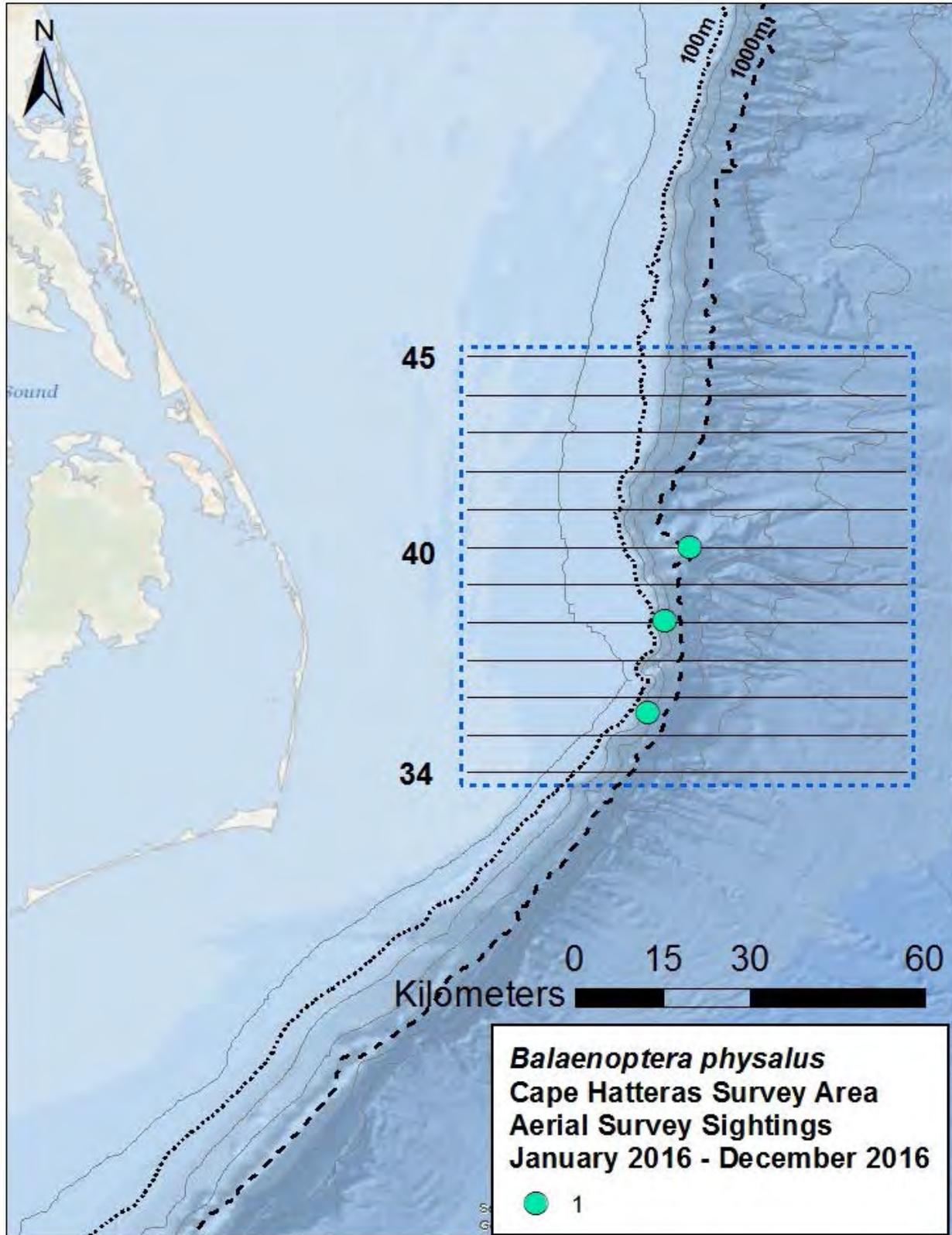


Figure 14. Fin whale (*Balaenoptera physalus*) sightings in the Cape Hatteras survey area in 2016 (N=3).

4.3.5 Gervais' beaked whale (*Mesoplodon europaeus*)

Two sightings identified as Gervais' beaked whale were recorded—one in July (12 individuals) and one in August (2 individuals) (**Table 13**). Both sightings were in deep waters offshore of the 1,000-m isobath (**Figure 15**). As part of the ongoing effort to develop species-specific characters for identifying beaked whales, all images of beaked whales were examined and compared to published works as well as to our own growing inventory of sightings. This process continues with each new sighting to further refine identifiable features of these species in the field. On 20 July 2016, images of one of the 12 individuals sighted revealed the presence of erupted mandibular teeth near the center of the animal's rostrum. The placement and size of teeth can be used to identify beaked whales to species (Mead 1989). We compared these images to both published images and stranding photos for which definitive species identification had been established, and determined that the aerial survey images were of Gervais' beaked whales. On 10 August 2016, one of the two individuals sighted also displayed erupted teeth that permitted this entire sighting to be identified as Gervais' beaked whales.

Table 13. Gervais' beaked whale (*Mesoplodon europaeus*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
20-Jul-2016	9:40:33	9	35.350404	-74.709804	34	3	4	100°	12	
10-Aug-2016	10:52:22	39	35.475640	-74.597048	36	3	2	100°	2	

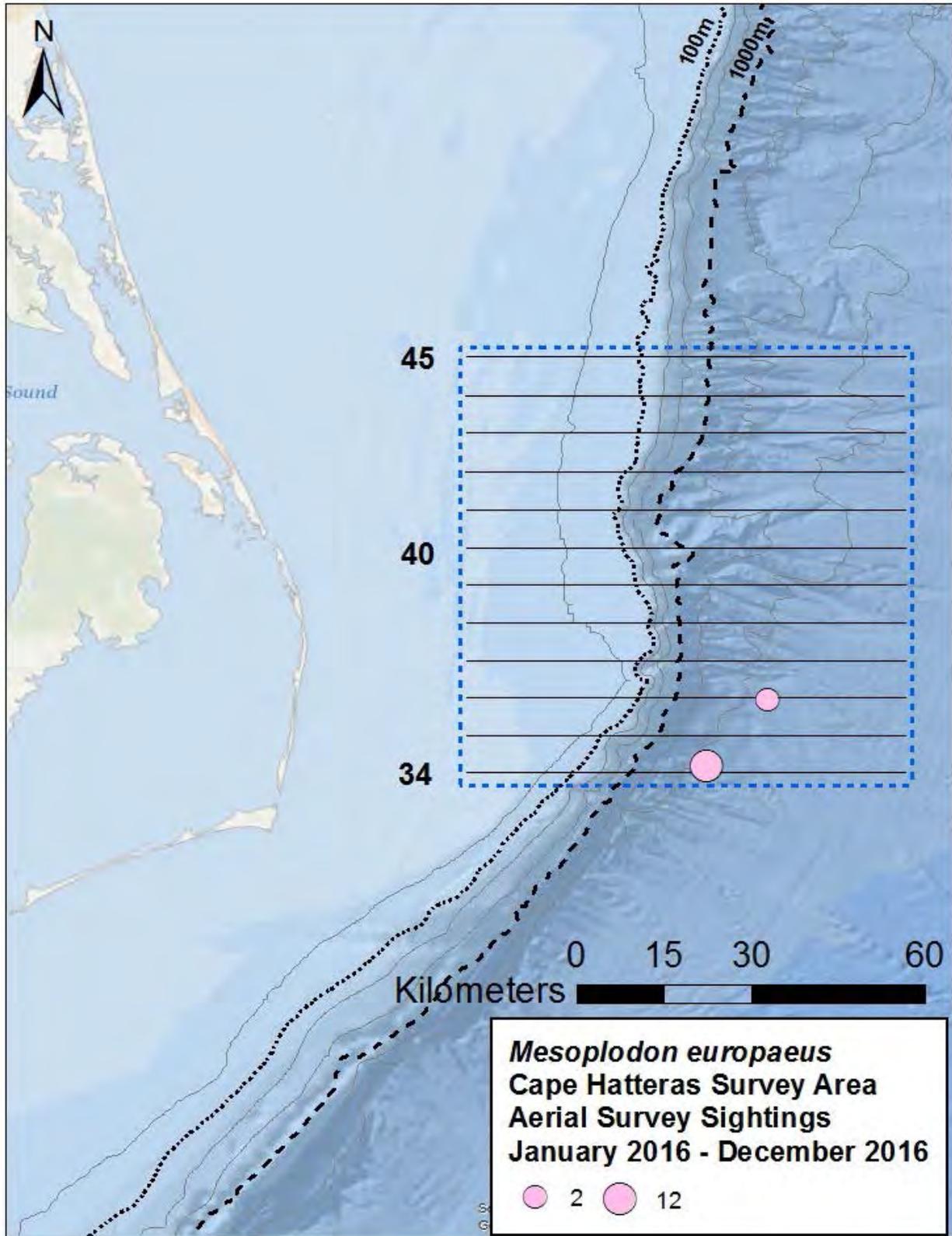


Figure 15. Gervais' beaked whale (*Mesoplodon europaeus*) sightings in the Cape Hatteras survey area in 2016 (N=2). Symbol size indicates group size.

4.3.6 *Kogia* sp.

On one occasion, one group of seven kogiid whales was observed seaward of the 2,000-m isobath. This is the largest group of kogiids that we have ever encountered during any Navy survey. They were classified as *Kogia* sp. since species-specific distinction cannot be made with 100 percent certainty (**Table 14, Figure 16**).

Table 14. *Kogia* sp. sighting in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
02-Nov-2016	15:45:52	112	35.761566	-74.454540	40	2	1	90°	7	

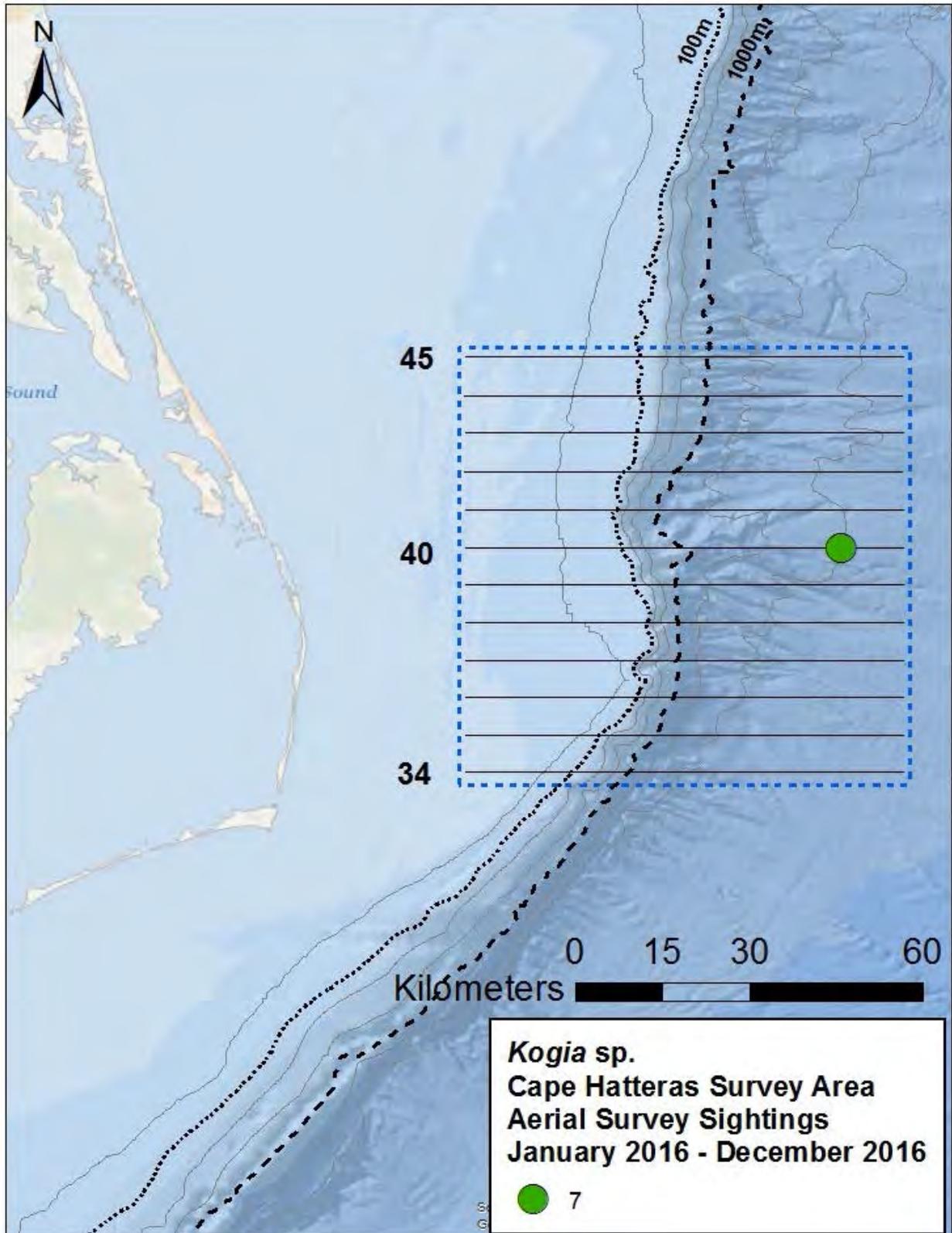


Figure 16. Kogiid whale (*Kogia* sp.) sighting in the Cape Hatteras survey area in November 2016.

4.3.7 Mesoplodont beaked whale (*Mesoplodon* sp.)

On one occasion, two beaked whales were observed. The individuals were determined not to be Cuvier’s beaked whales, but they could not be positively identified to species (**Table 15, Figure 17**). Since no species identification could be established, the sighting is listed here as *Mesoplodon* sp. This sighting occurred on the 1,000-m isobath.

Table 15. Unidentified *Mesoplodon* sighting in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
11-May-2016	15:55:43	102	35.692449	-74.758884	39	2	1	90°	2	

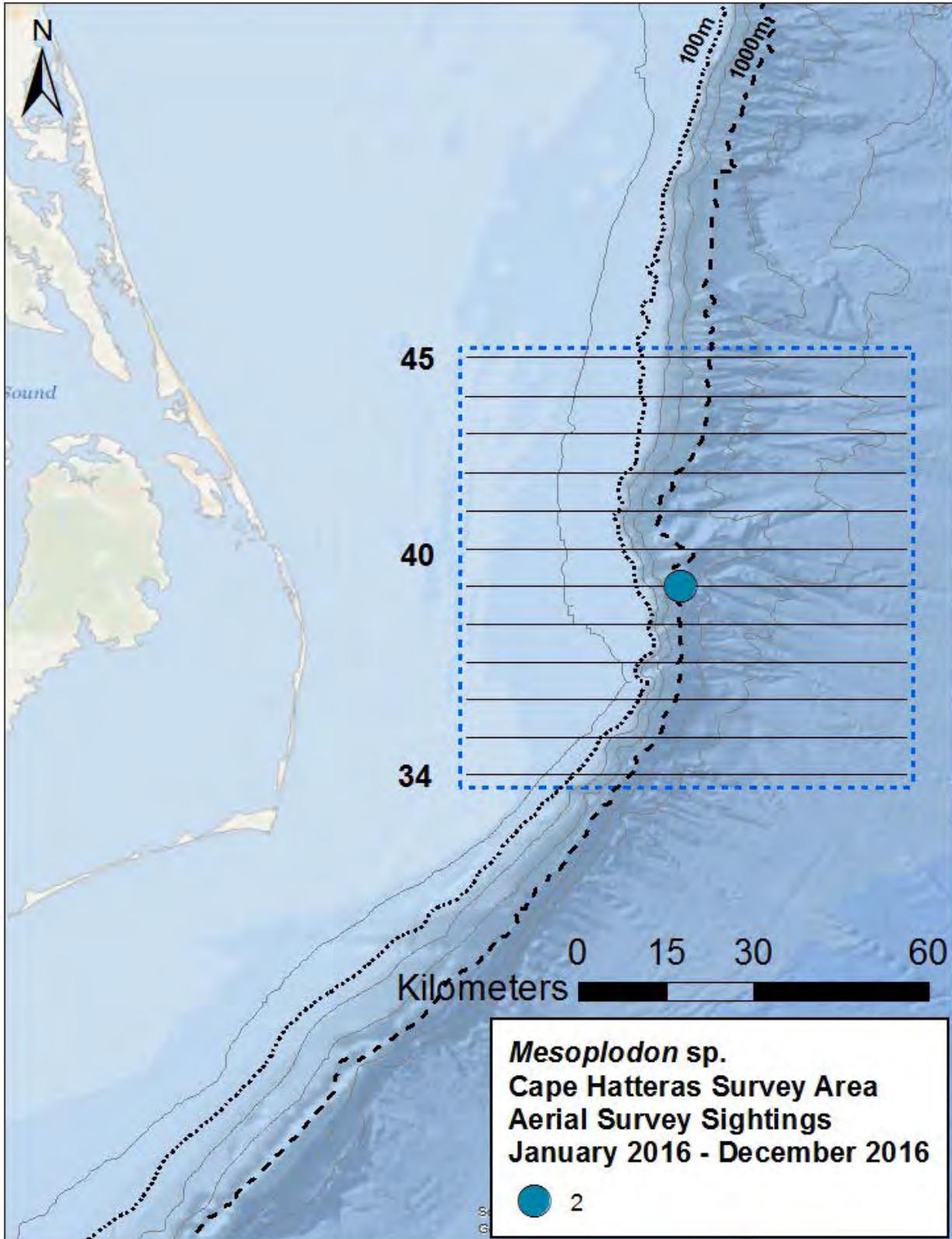


Figure 17. Unidentified *Mesoplodon* sighting in the Cape Hatteras survey area in May 2016.

4.3.8 Humpback whale (*Megaptera novaengliae*)

A single humpback whale was observed on-effort inside the survey area on one occasion this year (**Table 16, Figure 18**). On 8 March 2016, a single animal was observed on trackline 39 at the 100-m isobath. On this same day, a single off-effort sighting of a humpback whale occurred while transiting to the airport. Analysis of photographs demonstrated that the sightings were of two different individuals. Since this species has been the focus of current and past photo-identification work in the region, all efforts were made to document any features that could aid in identifying the individual. Images collected from each sighting were shared with teams responsible for maintaining the North Atlantic Humpback Whale Catalog.

Table 16. Humpback whale (*Megaptera novaeangliae*) sightings in the Cape Hatteras survey area in 2016. Asterisk denotes off-effort sightings.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
08-Mar-2016	14:15:15	55	35.730777	-75.250326			4	90°	1	*
08-Mar-2016	14:47:08	63	35.668123	-74.832240	39	3	3	110°	1	

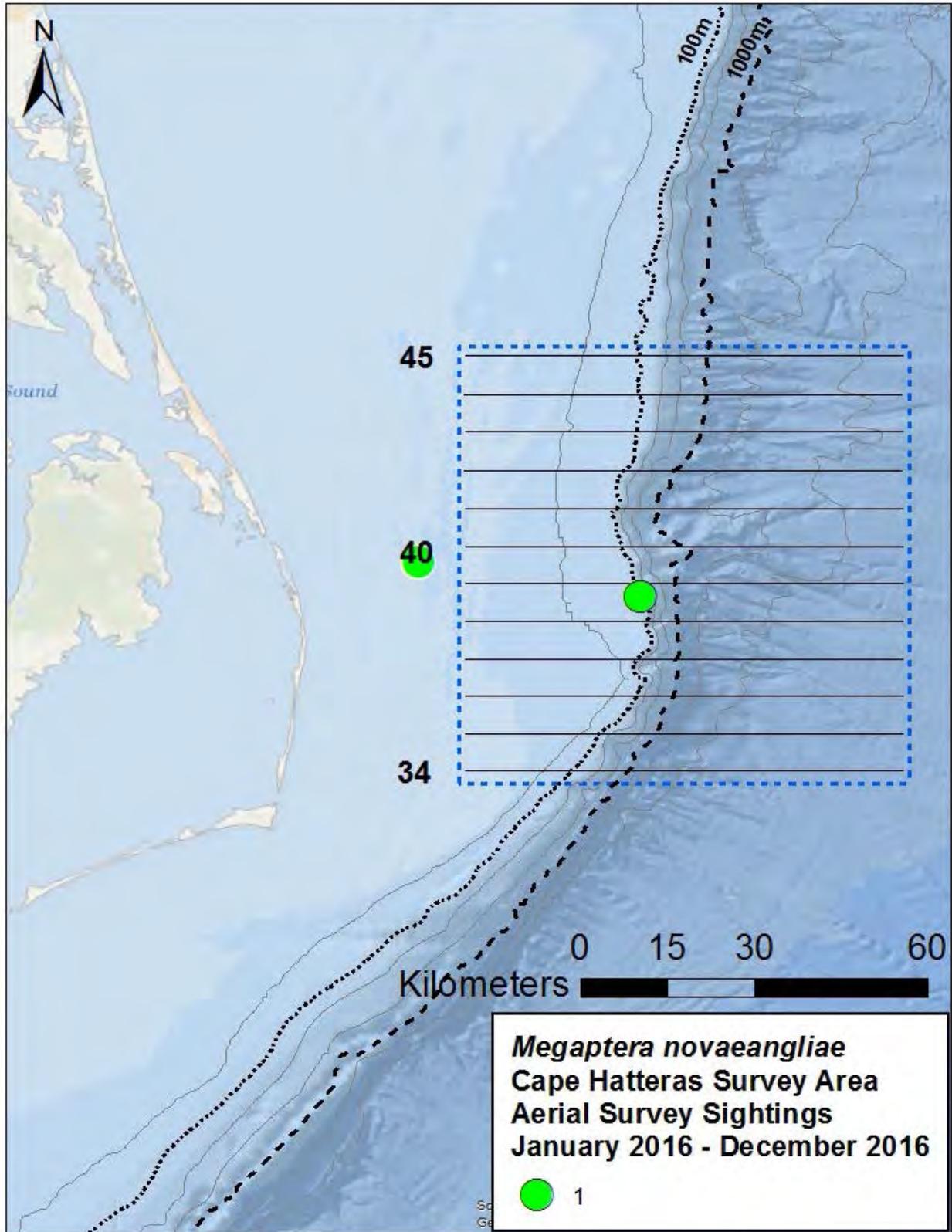


Figure 18. Humpback whale (*Megaptera novaeangliae*) sightings in the Cape Hatteras survey area in March 2016 (N=2). White outline denotes off-effort sighting.

4.4 Sea Turtles

There were 49 sightings of sea turtles, totaling 50 individuals (**Tables 17 and 18, Figures 19 and 20**). Sighting rates were negatively correlated with BSS, with rates sharply declining at BSS higher than 2 (**Figures 21a-b**). Sea turtles were recorded in five of eight months surveyed, with the highest number of sightings in August (**Figure 21c**). Loggerhead sea turtles represented the majority (N=46, 92 percent) of total sea turtles sighted. The only other sea turtle species identified in the Cape Hatteras survey area was the leatherback sea turtle (N=3, 6 percent of total sea turtles sighted). The remaining sighting of a single turtle could not be identified to species with 100 percent certainty; it is, therefore, listed as “unidentified sea turtle.”

4.4.1 Loggerhead sea turtle (*Caretta caretta*)

Sightings of loggerhead sea turtles occurred in five of eight months surveyed. All loggerhead sightings were single animals except for one sighting of two, for a total of 46 animals (**Table 17, Figure 19**). The vast majority of sightings were over the continental shelf and inshore of the 1,000-m isobath in the Cape Hatteras survey area.

4.4.2 Leatherback sea turtle (*Dermochelys coriacea*)

In November three sightings of lone leatherback sea turtles were observed from inshore of the 100-m isobaths in the Cape Hatteras survey area (**Table 18, Figure 20**).

Table 17. Loggerhead sea turtle (*Caretta caretta*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
11-May-2016	10:39:31	18	35.405376	-75.125256	35	2	3	90°	1	
11-May-2016	12:15:30	58	35.553231	-74.895588	37	2	3	90°	1	
11-May-2016	12:18:40	59	35.552846	-75.023965	37	2	2	60°	1	
11-May-2016	12:18:41	40	35.552868	-75.025152	37	2	1	90°	1	
11-May-2016	14:39:59	47	35.620482	-75.089167	38	2	2	90°	2	
11-May-2016	14:43:17	69	35.620684	-74.962121	38	2	1	90°	1	
12-May-2016	12:32:29	3	35.758867	-74.869494	40	2	1	45°	1	
20-May-2016	9:19:22	3	36.119218	-75.085844	45	4	3	90°	1	
09-Jul-2016	9:41:48	10	36.041843	-75.060612	44	4	2	90°	1	
09-Jul-2016	9:49:19	15	35.975169	-75.077546	43	4	1	90°	1	
09-Jul-2016	10:40:35	18	35.902791	-75.093823	42	5	1	90°	1	
20-Jul-2016	13:48:37	40	35.825587	-75.125688	41	2	2	90°	1	
20-Jul-2016	13:56:50	45	35.827704	-74.957891	41	2	1	90°	1	
20-Jul-2016	14:06:30	50	35.825584	-74.804645	41	2	1	60°	1	
20-Jul-2016	15:03:25	43	35.758835	-74.957346	40	3	2	90°	1	
20-Jul-2016	16:08:56	97	35.619924	-75.099411	38	2	2	90°	1	
10-Aug-2016	9:06:02	3	35.336133	-75.101337	34	1	1	90°	1	

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
10-Aug-2016	10:11:22	17	35.407132	-75.086155	35	2	2	90°	1	
10-Aug-2016	10:13:21	23	35.407384	-75.154571	35	2	2	90°	1	
10-Aug-2016	10:18:32	20	35.474350	-75.089638	36	2	1	90°	1	
10-Aug-2016	10:23:26	21	35.474621	-74.915301	36	2	2	100°	1	
10-Aug-2016	11:39:46	38	35.557827	-75.017553	37	2	2	90°	1	
10-Aug-2016	14:01:21	62	35.618860	-74.889356	38	3	2	90°	1	
10-Aug-2016	14:51:16	54	35.688630	-75.138159	39	2	1	90°	1	
11-Aug-2016	8:44:02	3	35.903177	-75.075168	42	2	1	90°	1	
11-Aug-2016	9:36:58	24	35.975078	-74.941539	43	2	1	90°	1	
11-Aug-2016	9:38:36	15	35.974898	-74.999203	43	2	2	90°	1	
11-Aug-2016	9:39:57	16	35.974817	-75.048088	43	2	1	90°	1	
11-Aug-2016	9:42:37	17	35.974584	-75.143525	43	2	1	90°	1	
11-Aug-2016	9:42:41	25	35.974551	-75.145732	43	2	1	90°	1	
11-Aug-2016	9:49:54	28	36.041911	-74.997541	44	2	1	90°	1	
11-Aug-2016	10:42:13	52	36.121242	-74.979128	45	2	1	90°	1	
27-Oct-2016	9:11:40	3	35.620675	-74.977874	38	2	1	90°	1	
27-Oct-2016	10:15:41	17	35.687310	-74.875331	39	2	2	90°	1	
02-Nov-2016	9:28:16	4	35.338560	-74.971925	34	2	1	90°	1	
02-Nov-2016	9:50:45	9	35.405409	-74.448295	35	2	2	90°	1	
02-Nov-2016	10:13:53	12	35.405761	-75.069940	35	2	1	90°	1	
02-Nov-2016	10:53:45	28	35.475919	-74.438580	36	2	2	90°	1	
02-Nov-2016	11:37:18	49	35.554464	-75.070100	37	2	1	90°	1	
02-Nov-2016	13:41:14	60	35.620405	-75.071918	38	2	1	90°	1	
02-Nov-2016	13:55:40	64	35.618592	-75.054806	38	2	2	70°	1	
02-Nov-2016	14:02:40	68	35.620925	-74.818694	38	1	1	80°	1	
02-Nov-2016	14:12:14	77	35.618468	-74.696573	38	1	3	100°	1	
02-Nov-2016	15:07:00	67	35.758331	-74.993766	40	1	1	60°	1	
02-Nov-2016	16:21:29	93	35.826522	-74.929859	41	1	1	90°	1	

Table 18. Leatherback sea turtle (*Dermochelys coriacea*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Off Effort (*)
02-Nov-2016	14:48:35	87	35.693823	-74.876510	39	1	2	90°	1	
02-Nov-2016	14:58:23	62	35.687535	-75.108547	39	1	1	90°	1	
02-Nov-2016	16:20:48	134	35.826446	-74.903940	41	1	1	90°	1	

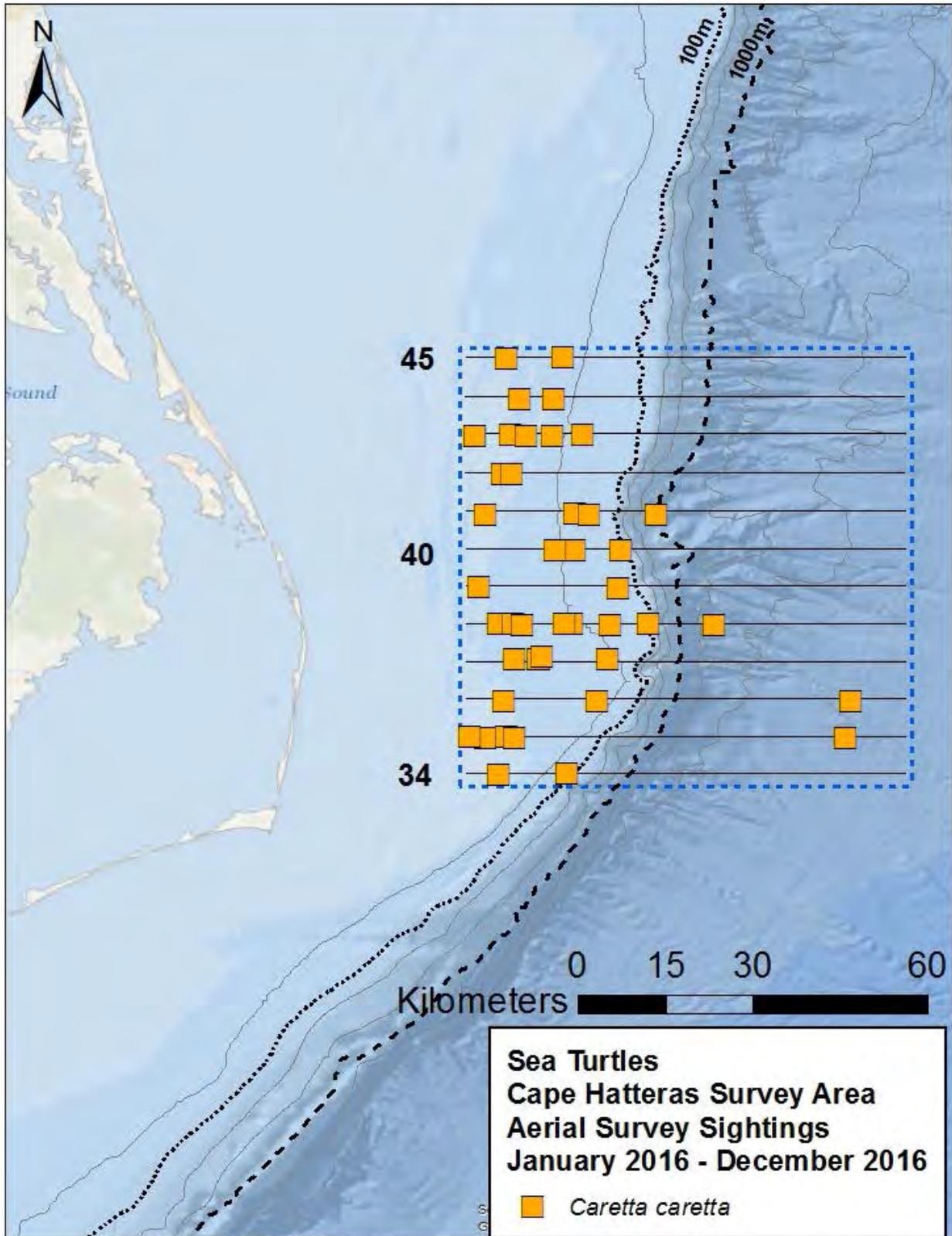


Figure 19. Loggerhead sea turtle (*Caretta caretta*) sightings in the Cape Hatteras survey area in 2016 (N=45).

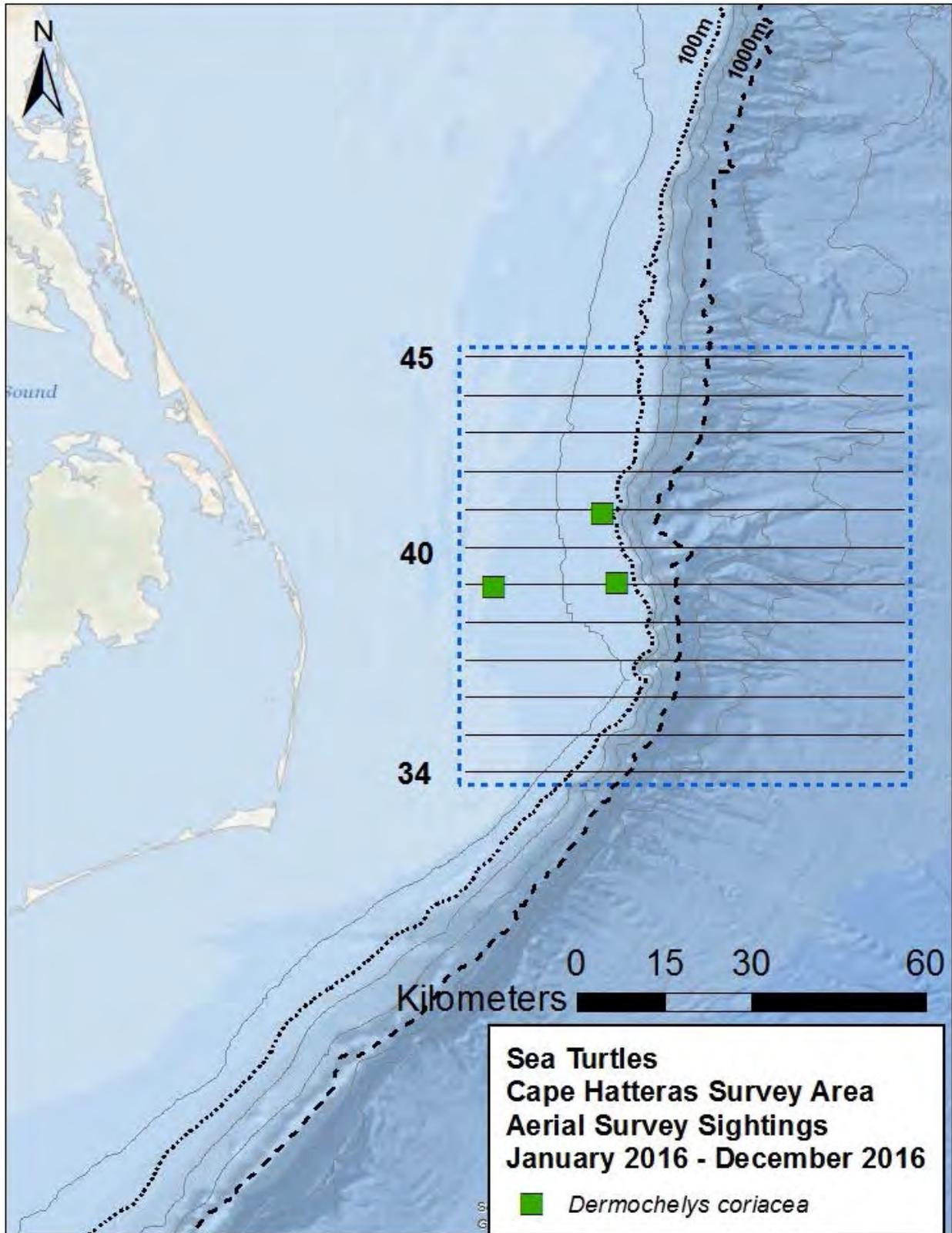


Figure 20. Leatherback sea turtle (*Dermochelys coriacea*) sightings in the Cape Hatteras survey area from in 2016 (N=3).

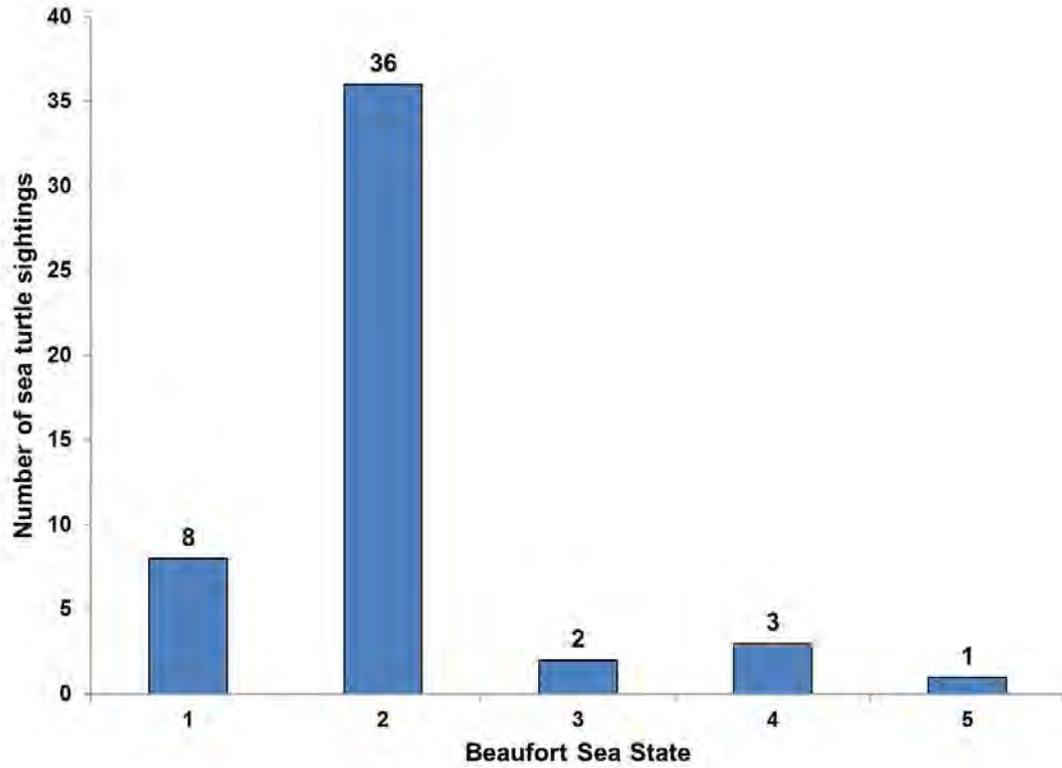


Figure 21a. Total number of sea turtle sightings by BSS category in the Cape Hatteras survey area in 2016.

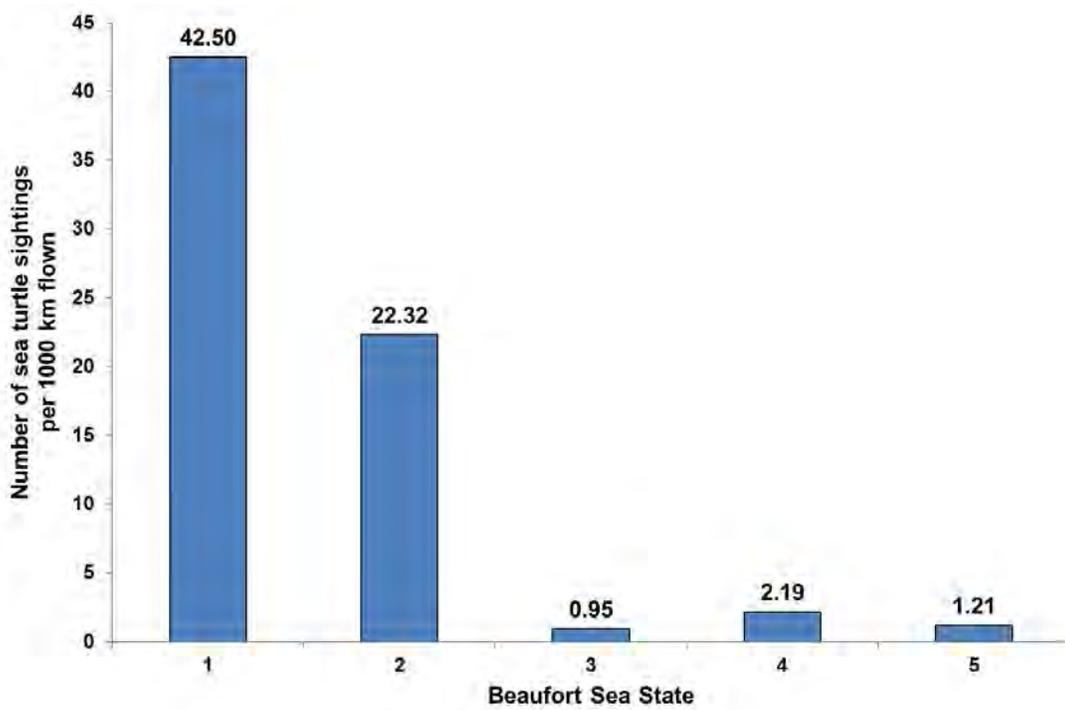


Figure 21b. Sea turtle sightings per 1,000 km flown by BSS category in the Cape Hatteras survey area in 2016.

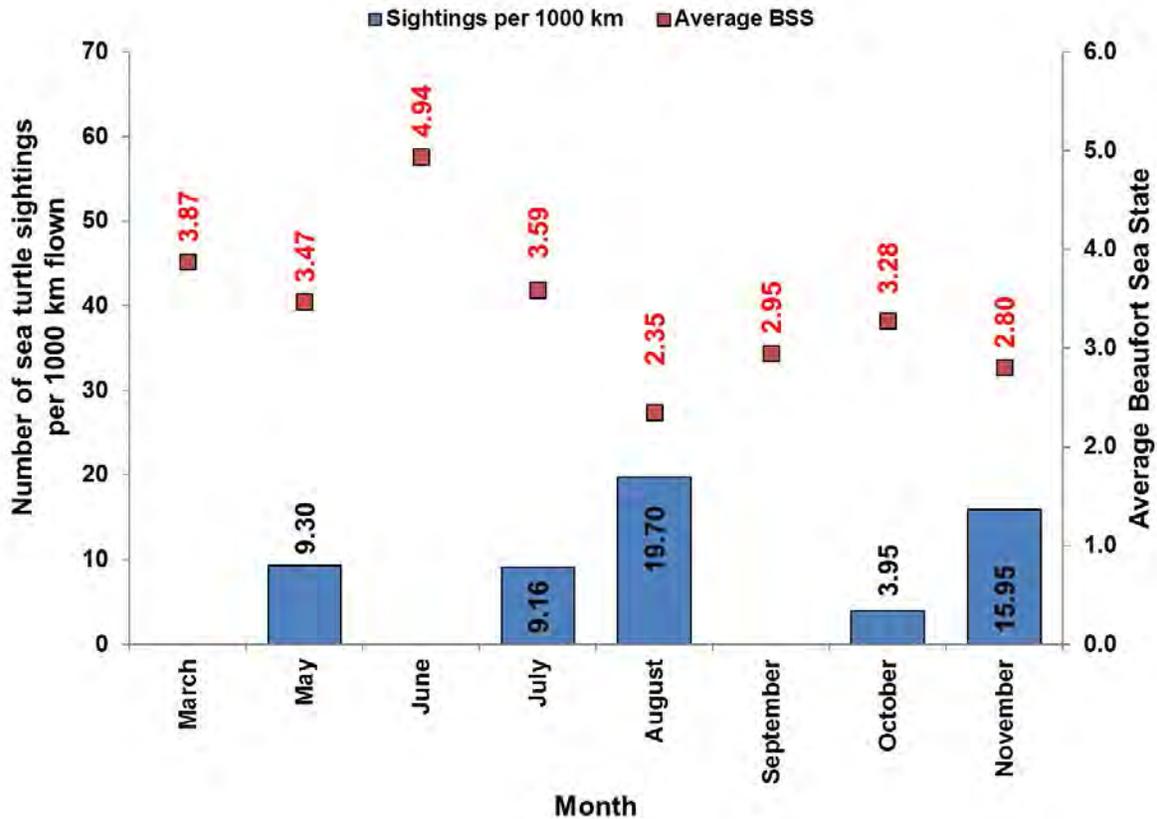


Figure 21c. Sea turtle sightings per 1,000 km surveyed and the average BSS per month in the Cape Hatteras survey area in 2016.

4.5 Other Marine Vertebrate Sightings

4.5.1 Cartilaginous Fishes (Chondrichthyes)

There were 14 sightings of sharks, for a total of 384 individuals, recorded during the reporting period, largely inshore of the 1,000-m isobath (**Tables 19**). Of the 384 sharks observed, 211 could be identified as hammerhead sharks (*Sphyrna* sp.) based on head shape, but since none of these sightings could be identified to species they have been included with the unidentified sharks. Two species of rays were identified: 31 manta rays (**Table 20**) and 900 cownose rays (**Table 21**). All sightings are represented in **Figure 22**.

4.5.2 Other fishes

Sixteen ocean sunfish were recorded, with the majority of sightings made offshore of the 1,000-m isobath (**Table 22, Figure 22**).

Table 19. Shark sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Comments
11-May-2016	10:33:56	17	35.405772	-74.920919	35	2	1	90°	1	Hammerhead shark
11-May-2016	12:24:45	62	35.545299	-75.084184	37	2	3	90°	45	Sharks
12-May-2016	12:46:12	12	35.757970	-74.737735	40	2	2	90°	1	Shark
10-Aug-2016	15:23:32	82	35.757265	-74.494744	40	3	1	90°	1	Shark
27-Oct-2016	14:50:39	59	36.120128	-74.919575	45	4	1	90°	1	Hammerhead shark
02-Nov-2016	13:57:30	44	35.619922	-74.984688	38	1	1	90°	1	Shark
02-Nov-2016	13:59:06	65	35.620575	-74.922984	38	2	1	100°	1	Hammerhead shark
02-Nov-2016	14:42:25	84	35.696518	-74.782093	39	1	2	90°	200	Hammerhead sharks
02-Nov-2016	14:44:00	55	35.691302	-74.786302	39	2	1	90°	125	3 Groups of sharks
02-Nov-2016	15:03:43	94	35.757916	-75.112082	40	1	1	90°	1	Hammerhead shark
02-Nov-2016	15:03:50	95	35.757896	-75.107428	40	1	2	60°	1	Hammerhead shark
02-Nov-2016	15:08:10	97	35.758281	-74.951744	40	1	1	90°	4	Hammerhead shark
02-Nov-2016	16:27:17	135	35.825876	-75.150579	41	1	2	70°	1	Hammerhead shark
03-Nov-2016	14:43:21	49	36.041943	-74.911378	44	4	1	100°	1	Hammerhead shark

Table 20. Manta ray (*Manta birostris*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #
09-Mar-2016	15:34:23	64	35.403382	-74.877536	35	4	1	100°	1
11-May-2016	14:42:16	49	35.620650	-75.001321	38	2	1	90°	1
20-May-2016	10:27:03	16	35.974360	-74.763110	43	5	2	90°	1
20-Jul-2016	14:18:03	55	35.825873	-74.693336	41	3	2	90°	1
10-Aug-2016	10:24:24	27	35.474783	-74.880079	36	2	3	90°	1
10-Aug-2016	15:53:39	89	35.827457	-74.575852	41	3	2	110°	1
10-Aug-2016	16:04:51	70	35.827522	-74.864179	41	3	2	100°	1
11-Aug-2016	9:57:33	31	36.042038	-74.709698	44	2	1	90°	1
11-Aug-2016	9:58:55	23	36.041872	-74.658562	44	2	2	90°	1
11-Aug-2016	9:59:40	32	36.041866	-74.630926	44	2	2	90°	2
11-Aug-2016	10:00:11	33	36.041827	-74.611110	44	2	1	90°	4
11-Aug-2016	10:00:19	24	36.041794	-74.605943	44	2	2	90°	6
11-Aug-2016	10:02:00	25	36.041683	-74.543002	44	2	1	90°	1
11-Aug-2016	10:28:33	32	36.121577	-74.694327	45	1	3	90°	1
11-Aug-2016	10:36:57	38	36.122183	-74.790404	45	2	3	90°	1
11-Sep-2016	13:52:37	28	35.690544	-74.752556	39	3	2	90°	1
12-Sep-2016	10:02:14	15	35.978271	-74.900873	43	3	1	90°	2
27-Oct-2016	11:22:31	36	35.825839	-74.850283	41	3	1	90°	1
27-Oct-2016	14:29:16	73	36.043931	-74.836769	44	4	1	90°	1
02-Nov-2016	13:40:26	59	35.620300	-75.101917	38	2	1	90°	1
02-Nov-2016	14:51:49	59	35.687740	-74.981100	39	1	1	90°	1

Table 21. Cownose ray (*Rhinoptera bonasus*) sighting in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #
11-May-2016	16:33:51	71	35.686720	-75.097410	39	3	2	90°	900

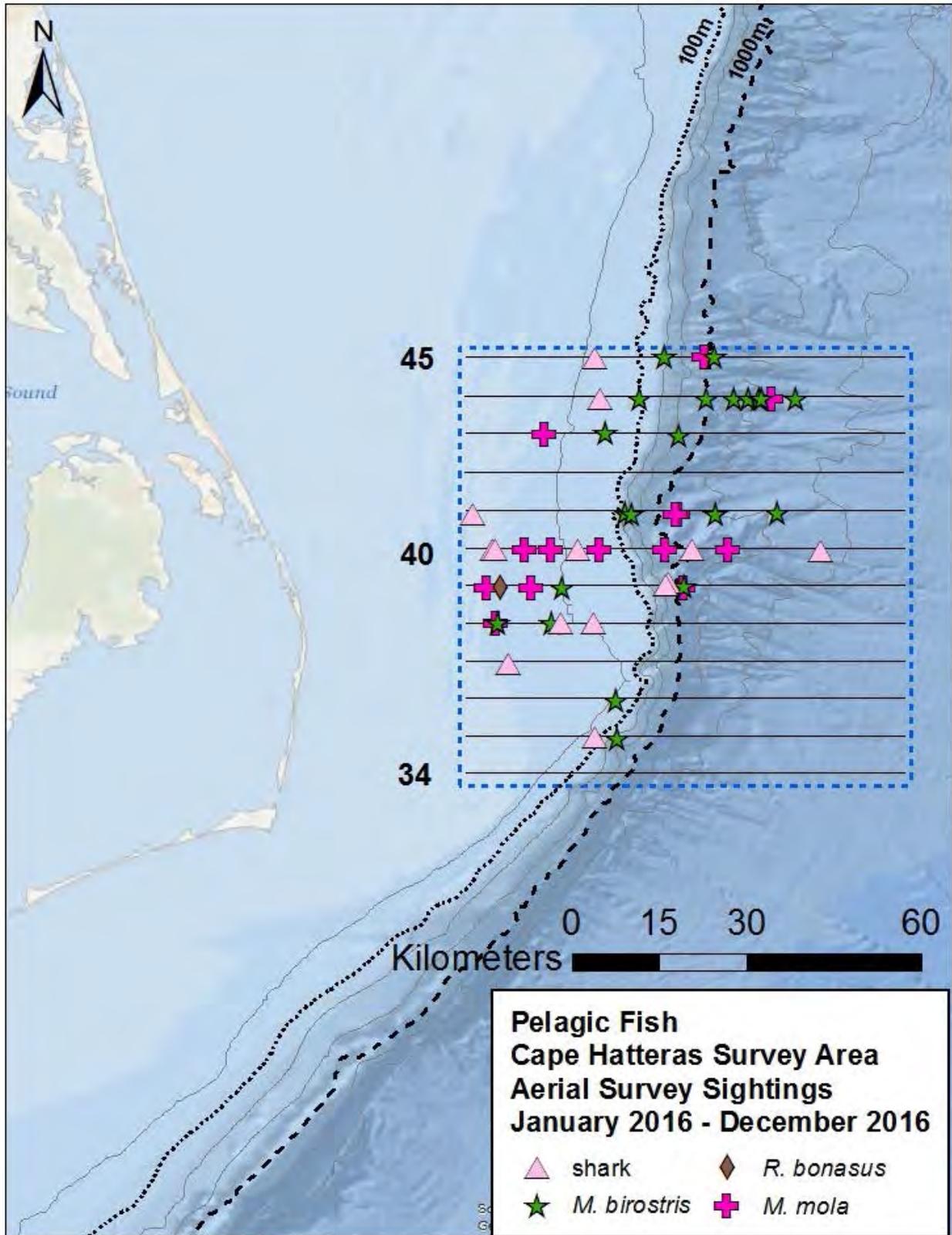


Figure 22. Manta ray (*Manta birostris*), cownose ray (*Rhinoptera bonasus*), ocean sunfish (*Mola mola*), and shark sightings in the Cape Hatteras survey area in 2016 (N=66).

Table 22. Ocean sunfish (*Mola mola*) sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #
08-Mar-2016	9:45:02	7	36.042163	-74.586451	44	4	1	90°	1
09-Jul-2016	9:50:58	16	35.975446	-75.012726	43	4	1	90°	1
27-Oct-2016	10:12:37	16	35.687335	-74.751453	39	2	2	90°	2
27-Oct-2016	10:28:36	27	35.758757	-75.051527	40	3	2	90°	1
02-Nov-2016	13:40:19	58	35.620298	-75.106283	38	2	1	90°	1
02-Nov-2016	14:54:04	90	35.688493	-75.038447	39	1	3	120°	1
02-Nov-2016	14:58:45	63	35.687521	-75.122081	39	1	1	90°	1
02-Nov-2016	15:06:48	96	35.758330	-75.000477	40	1	3	100°	1
02-Nov-2016	15:09:20	98	35.758421	-74.909599	40	1	2	60°	1
02-Nov-2016	15:18:34	70	35.758611	-74.787521	40	1	1	90°	1
02-Nov-2016	15:27:38	75	35.758407	-74.666991	40	1	1	90°	2
02-Nov-2016	16:13:22	90	35.826783	-74.762946	41	1	1	90°	1
02-Nov-2016	16:13:31	129	35.826661	-74.767929	41	1	1	90°	1
03-Nov-2016	14:15:10	45	36.121943	-74.711921	45	4	1	90°	1

4.6 Vessel Sightings

4.6.1 Commercial

A total of 32 commercial (tankers, car carriers, cargo vessels, and tugs with barges), fishing, and research vessels was observed in the Cape Hatteras survey area (**Table 23, Figure 23**).

Table 23. Commercial vessel sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Comments
08-Mar-2016	12:15:09	46	35.770806	-74.747477	40	4	2	90°	1	Commercial fishing vessel
08-Mar-2016	12:20:02	49	35.757501	-74.824094	40	3	3	90°	2	Commercial fishing vessels
08-Mar-2016	16:05:02	94	35.554619	-74.552584	37	3	4	40°	1	Cargo vessel
09-Mar-2016	15:37:30	66	35.410817	-74.986188	35	5	2	45°	1	Cargo vessel
11-May-2016	9:28:12	3	35.338931	-75.025108	34	3	3	40°	1	Cargo vessel
11-May-2016	14:48:09	71	35.615122	-74.780805	38	2	2	20°	1	Cargo vessel
20-May-2016	9:31:30	5	36.120700	-74.655965	45	5	2	45°	1	Cargo vessel

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Comments
20-May-2016	10:48:14	20	35.905194	-74.607631	42	5	2	45°	1	Tanker
11-Jun-2016	13:22:53	6	35.410163	74.941287	35	5	4	70°	1	Car carrier
11-Jun-2016	14:29:25	19	35.550231	75.139585	37	5	4	90°	1	Cargo vessel
09-Jul-2016	8:53:09	3	36.121366	-74.998083	45	4	2	60°	1	Tanker
09-Jul-2016	10:23:16	20	35.903157	-74.754876	42	5	4	60°	1	NOAA Research Vessel
20-Jul-2016	15:28:37	51	35.687496	-74.669527	39	3	1	90°	1	Cargo vessel
20-Jul-2016	15:31:34	52	35.687648	-74.562889	39	3	2	60°	1	Trawler
10-Aug-2016	11:39:55	39	35.557643	-75.022935	37	2	1	60°	1	Tug and Barge
10-Aug-2016	14:28:03	70	35.686533	-74.353593	39	3	1	90°	1	Cargo vessel
11-Sep-2016	13:16:08	26	35.621631	-75.066318	38	4	3	60°	1	Commercial fishing vessel
11-Sep-2016	14:08:02	36	35.763158	-75.067417	40	3	3	40°	1	Commercial fishing vessel
12-Sep-2016	9:56:14	21	35.978873	-74.672680	43	2	3	90°	1	Commercial fishing vessel
12-Sep-2016	9:57:49	22	35.978342	-74.733724	43	2	1	90°	1	Commercial fishing vessel
12-Sep-2016	9:59:19	24	35.978148	-74.790809	43	3	1	90°	1	Commercial fishing vessel
12-Sep-2016	10:45:52	24	36.048795	-74.343847	44	2	3	90°	1	Commercial fishing vessel
27-Oct-2016	10:43:31	25	35.758415	-74.788657	40	3	4	90°	1	Commercial fishing vessel
27-Oct-2016	14:23:42	53	36.043469	-75.058895	44	4	2	90°	1	Commercial fishing vessel
27-Oct-2016	14:26:11	54	36.043601	-74.959601	44	4	3	45°	1	Commercial fishing vessel
27-Oct-2016	14:33:46	56	36.043954	-74.658030	44	4	4	90°	1	Tanker
27-Oct-2016	14:34:19	74	36.043720	-74.635788	44	4	3	60°	1	Cargo vessel
02-Nov-2016	15:28:58	77	35.758371	-74.616186	40	2	2	45°	1	Car carrier
03-Nov-2016	14:08:18	28	36.121719	-74.996695	45	3	4	40°	1	Commercial fishing vessel
03-Nov-2016	14:35:19	32	36.042068	-74.608211	44	4	4	60°	1	Commercial fishing vessel
03-Nov-2016	14:46:33	34	36.041855	-75.029268	44	4	4	40°	1	Commercial fishing vessel

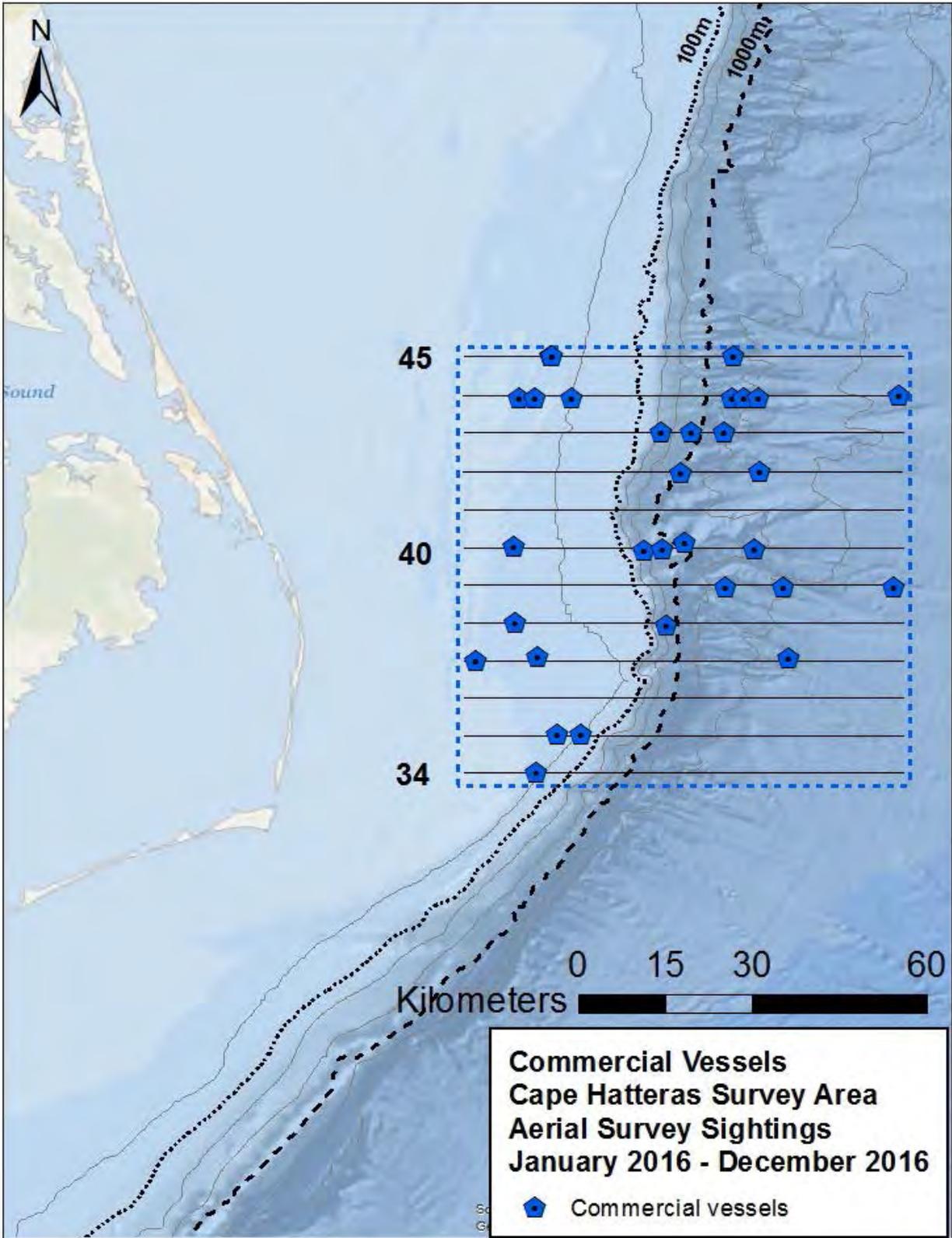


Figure 23. Commercial vessel sightings in the Cape Hatteras survey area in 2016 (N=31).

4.6.2 Military Vessels

Five military vessels were observed in the Cape Hatteras survey area (Table 24, Figure 24).

Table 24. Military vessel sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Comments
11-Jun-2016	13:09:27	6	35.409788	-74.440291	35	5	4	45°	1	Military
20-Jul-2016	14:19:07	56	35.826240	-74.655756	41	3	4	60°	1	Military
20-Jul-2016	15:01:23	74	35.759182	-74.869922	40	3	4	60°	1	Military
03-Nov-2016	14:15:39	46	36.121859	-74.691526	45	4	4	90°	1	Military
03-Nov-2016	14:38:12	33	36.042033	-74.717927	44	4	4	40°	1	Military

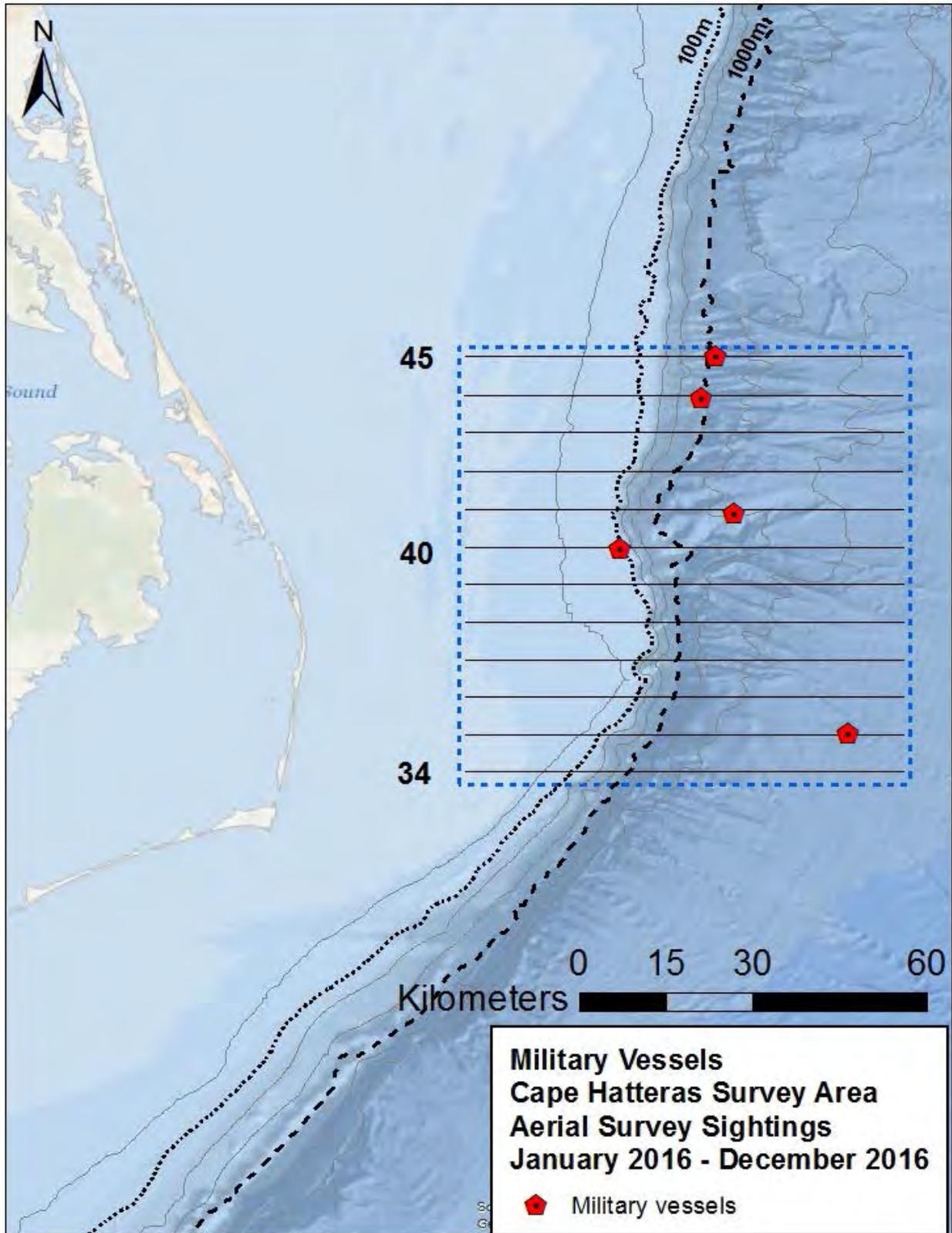


Figure 24. Military vessel sightings in the Cape Hatteras survey area in 2016 (N=5).

4.6.3 Other Vessels

A total of 224 other vessels was recorded in the Cape Hatteras survey area (**Table 25, Figure 25**). Other than five sailboats and two yachts, all other vessel sightings were categorized as recreational sport-fishing vessels.

Table 25. Other vessel sightings in the Cape Hatteras survey area in 2016.

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Comments
08-Mar-2016	12:18:59	43	35.760288	-74.784199	40	4	2	90°	1	Recreational fishing vessel
08-Mar-2016	14:26:11	58	35.688758	-74.998412	39	2	4	60°	6	Recreational fishing vessels
08-Mar-2016	14:29:40	60	35.688908	-74.852783	39	3	3	60°	2	Recreational fishing vessels
08-Mar-2016	15:42:38	63	35.618794	-75.042362	38	3	3	60°	1	Recreational fishing vessel
08-Mar-2016	15:58:42	69	35.554363	-74.816884	37	4	3	90°	3	Recreational fishing vessels
11-May-2016	9:30:42	4	35.338551	-74.927723	34	3	1	90°	1	Recreational fishing vessel
11-May-2016	10:33:21	16	35.405881	-74.899713	35	2	3	45°	2	Recreational fishing vessels
11-May-2016	10:34:06	19	35.405783	-74.927161	35	3	1	100°	1	Recreational fishing vessel
11-May-2016	12:01:36	49	35.553367	-74.770190	37	4	3	40°	6	Recreational fishing vessels
11-May-2016	14:40:32	48	35.620485	-75.067771	38	2	2	60°	1	Recreational fishing vessel
11-May-2016	14:46:15	70	35.620839	-74.848218	38	2	4	40°	13	Recreational fishing vessels
12-May-2016	12:54:05	8	35.758516	-74.615650	40	2	4	90°	3	Recreational fishing vessels
12-May-2016	12:54:20	16	35.758531	-74.607436	40	3	3	90°	3	Recreational fishing vessels
12-May-2016	13:11:31	21	35.826371	-74.552346	41	3	2	90°	2	Recreational fishing vessels
20-May-2016	10:17:42	13	35.972936	-75.104600	43	4	2	45°	1	Yacht
20-May-2016	10:53:20	21	35.905116	-74.831145	42	5	4	45°	2	Recreational fishing vessels
11-Jun-2016	12:46:48	3	35.341567	75.007596	34	5	1	120°	1	Recreational fishing vessel
11-Jun-2016	13:35:29	10	35.481371	75.012149	36	5	1	120°	2	Recreational fishing vessels
11-Jun-2016	13:37:15	10	35.481422	-74.940978	36	5	2	90°	1	Recreational fishing vessel
11-Jun-2016	13:37:56	11	35.481603	74.913439	36	5	3	90°	3	Recreational fishing vessels
11-Jun-2016	14:27:48	17	35.550366	-75.079797	37	6	3	90°	7	Recreational

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Comments
										fishing vessels
09-Jul-2016	8:58:16	5	36.121707	-74.796699	45	5	4	60°	1	Recreational fishing vessel
20-Jul-2016	10:33:02	19	35.474804	-74.856063	36	3	3	90°	18	Recreational fishing vessels
20-Jul-2016	10:33:44	14	35.474706	-74.828842	36	3	2	90°	2	Recreational fishing vessels
20-Jul-2016	11:22:23	33	35.554311	-74.804426	37	3	1	90°	1	Recreational fishing vessel
20-Jul-2016	15:06:53	45	35.758541	-75.106360	40	2	2	90°	2	Recreational fishing vessels
20-Jul-2016	15:12:16	48	35.687163	-75.106916	39	2	1	90°	1	Recreational fishing vessel
10-Aug-2016	9:39:20	8	35.407584	-74.633214	35	3	1	90°	1	Recreational fishing vessel
10-Aug-2016	11:30:51	52	35.554099	-74.838959	37	3	2	90°	4	Recreational fishing vessels
10-Aug-2016	14:01:21	45	35.618849	-74.888912	38	3	3	90°	1	Recreational fishing vessel
10-Aug-2016	14:43:20	53	35.689180	-74.840304	39	2	3	90°	1	Recreational fishing vessel
11-Aug-2016	8:47:52	4	35.903511	-74.936588	42	2	3	60°	1	Recreational fishing vessel
11-Aug-2016	8:47:58	3	35.903548	-74.932958	42	2	3	60°	1	Recreational fishing vessel
11-Aug-2016	8:56:25	8	35.902078	-74.776295	42	2	3	60°	3	Recreational fishing vessels
11-Aug-2016	9:01:38	13	35.905178	-74.724738	42	2	2	90°	2	Recreational fishing vessels
11-Aug-2016	9:52:04	29	36.042043	-74.915935	44	2	1	90°	1	Recreational fishing vessel
11-Aug-2016	9:56:24	22	36.042123	-74.752478	44	2	2	60°	2	Recreational fishing vessels
11-Aug-2016	9:56:42	30	36.042164	-74.741035	44	2	3	60°	8	Recreational fishing vessels
11-Aug-2016	10:29:15	33	36.121615	-74.718857	45	1	3	90°	6	Recreational fishing vessels
11-Sep-2016	9:25:57	3	35.340408	-74.943733	34	3	2	60°	2	Recreational fishing vessels
11-Sep-2016	9:26:15	3	35.340255	-74.931845	34	3	2	90°	1	Recreational fishing vessel
11-Sep-2016	9:27:29	4	35.341253	-74.882635	34	3	4	70°	9	Recreational fishing vessels
11-Sep-2016	10:00:05	10	35.410577	-74.850660	35	3	4	40°	8	Recreational fishing vessels
11-Sep-2016	10:00:33	6	35.410566	-74.866206	35	3	3	90°	2	Recreational fishing vessels

Date	Time	Way Point	Latitude	Longitude-1	Track Number	BSS	Angle out	Degree Forward	Best #	Comments
11-Sep-2016	10:19:52	9	35.481578	-74.847550	36	3	2	90°	7	Recreational fishing vessels
11-Sep-2016	10:20:16	13	35.481616	-74.831723	36	3	2	60°	3	Recreational fishing vessels
11-Sep-2016	10:53:02	20	35.550831	-74.717149	37	3	3	90°	1	Recreational fishing vessel
11-Sep-2016	10:54:45	14	35.550730	-74.774484	37	3	4	90°	2	Recreational fishing vessels
11-Sep-2016	10:56:18	15	35.550830	-74.825328	37	3	2	90°	2	Recreational fishing vessels
11-Sep-2016	11:00:38	21	35.551127	-74.966668	37	3	3	60°	1	Recreational fishing vessel
11-Sep-2016	13:55:29	33	35.690612	-74.862532	39	4	3	90°	2	Recreational fishing vessels
11-Sep-2016	14:12:58	31	35.763569	-74.870314	40	3	1	90°	1	Recreational fishing vessel
12-Sep-2016	9:43:36	12	35.978035	-74.433594	43	2	2	90°	2	Recreational fishing vessels
12-Sep-2016	10:23:14	18	36.050249	-74.752673	44	3	4	90°	1	Recreational fishing vessel
12-Sep-2016	11:16:34	47	36.123651	-74.694483	45	3	1	90°	1	Recreational fishing vessel
27-Oct-2016	9:08:20	3	35.619844	-75.107056	38	2	4	90°	1	Sailboat
27-Oct-2016	9:16:27	4	35.620362	-74.798029	38	2	3	45°	1	Recreational fishing vessel
27-Oct-2016	10:22:22	18	35.687048	-75.138402	39	2	3	90°	1	Yacht
27-Oct-2016	14:26:46	72	36.043571	-74.936314	44	4	1	60°	1	Recreational fishing vessel
27-Oct-2016	14:28:10	55	36.043655	-74.880024	44	4	1	90°	1	Recreational fishing vessel
02-Nov-2016	9:26:12	3	35.338239	-75.049616	34	2	4	40°	1	Recreational fishing vessel
02-Nov-2016	9:28:30	3	35.338565	-74.962911	34	2	2	90°	1	Sailboat
02-Nov-2016	9:31:51	5	35.339066	-74.837240	34	3	4	90°	2	Sailboat
02-Nov-2016	10:20:02	15	35.474997	-75.119120	36	2	2	45°	2	Sailboat
02-Nov-2016	10:36:41	20	35.475926	-74.922429	36	2	2	90°	1	Sailboat
02-Nov-2016	10:44:33	27	35.476179	-74.794673	36	2	4	90°	25	Recreational fishing vessels
02-Nov-2016	11:25:27	29	35.553459	-74.793349	37	2	3	90°	11	Recreational fishing vessels
02-Nov-2016	14:02:53	47	35.620872	-74.810579	38	1	2	90°	10	Recreational fishing vessels
02-Nov-2016	14:59:10	64	35.687225	-75.136855	39	1	3	90°	3	Recreational fishing vessel

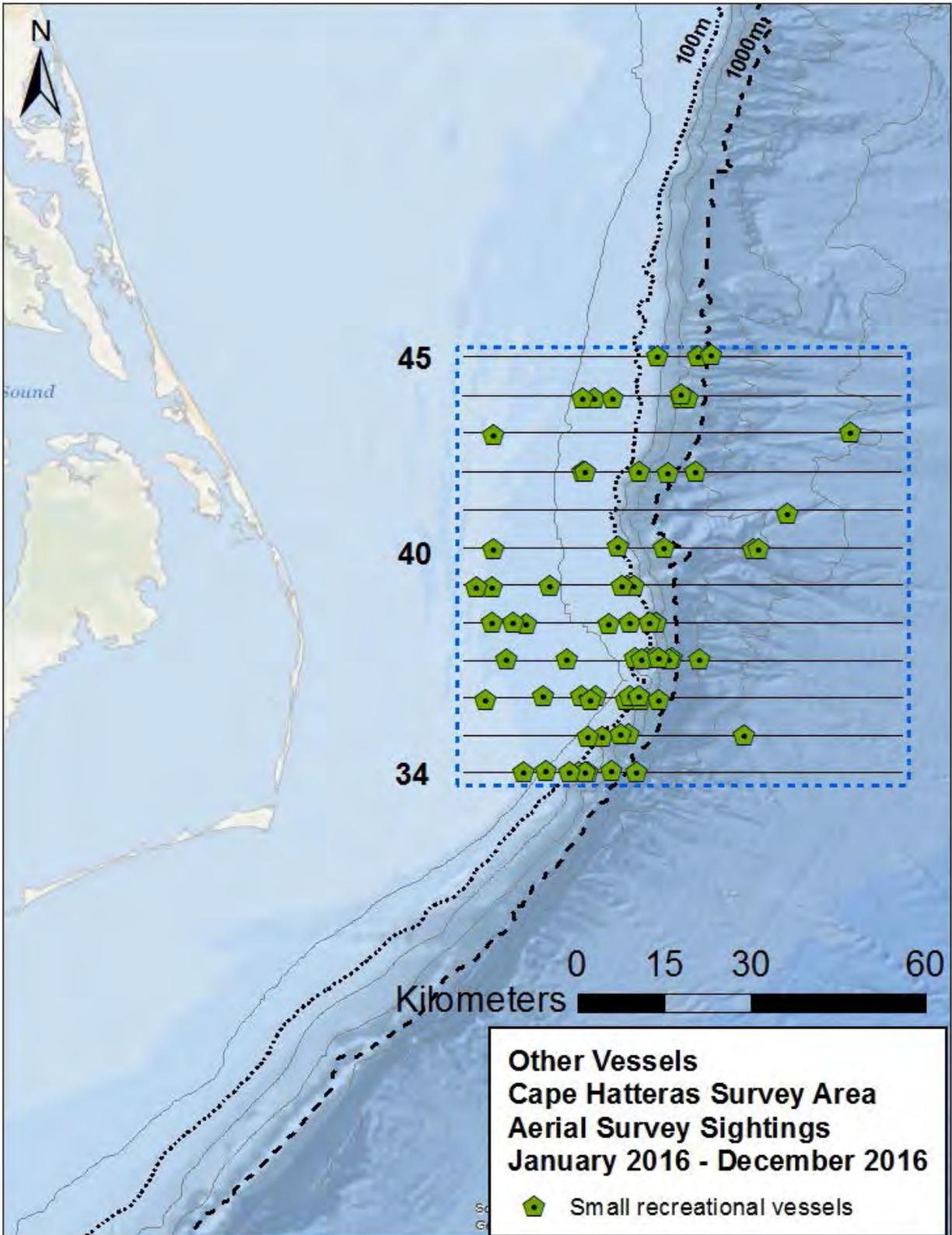


Figure 25. Other vessel sightings in the Cape Hatteras survey area in 2016 (N=69).

5. Acknowledgements

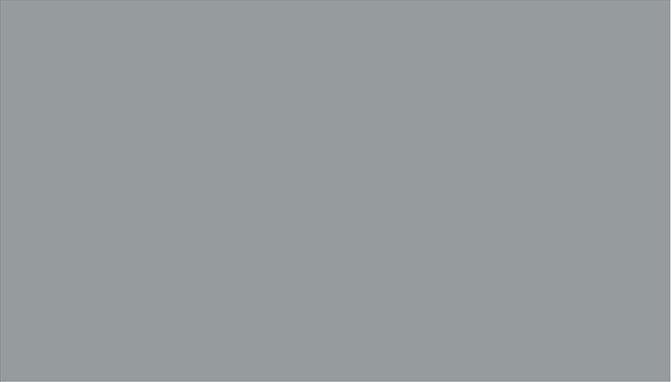
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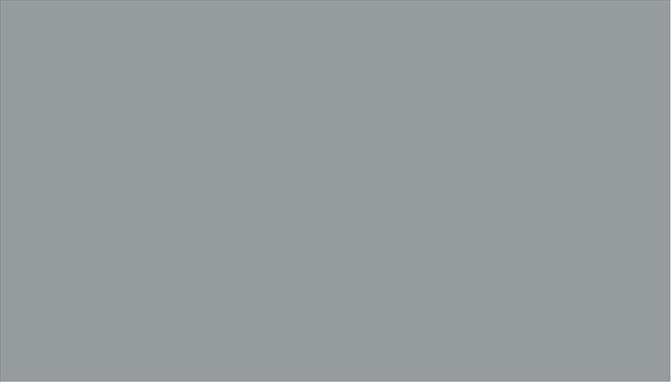
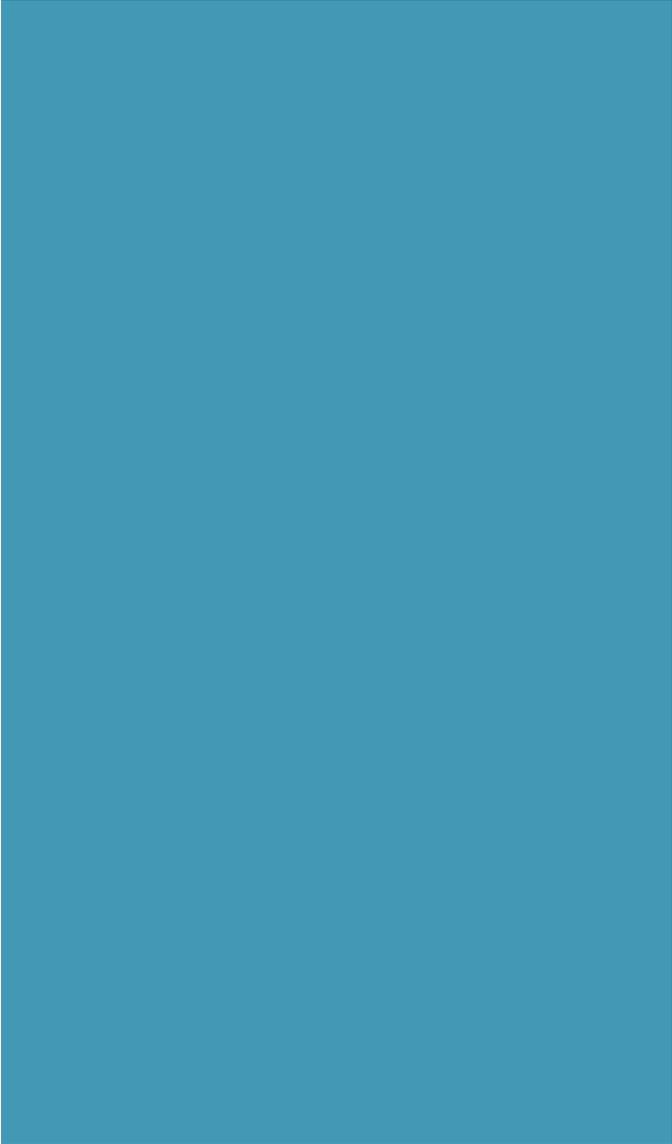
A

Aerial Survey Data Sheet



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B

Event Codes and Species List



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Codes for Variables on USWTR Aerial Survey Data Sheet

Date: Month, Day, Year

Track#: opportunistic track line=99

Event:

- | | |
|--|---|
| 1.1 = On effort/on track | 2.0 = Sighting-breaking track/off effort (real time) |
| 1.2 = Off effort | 2.3 = Vessel sighting |
| 3.1 = Change in environmental conditions | 2.4 = Sighting of marine mammal (real location) |
| | 2.41 = Location of Sighting Cue, No Animals sighted |
| 10.0 = Opportunistic sighting(s) | 2.42 = Break from sighting |
| PF = Preflight | |
| XB = Cross Beach | 2.7 = Sighting of sea turtle (real location) |
| WU = Wheels Up | 2.8 = Sighting of large vessel (Military, commercial, etc.) |
| WD = Wheels Down | |
| TE = Transit Leg on Effort | 2.9 = Unidentified sighting, requires comments |

Confidence of cue

- 1 = definite
- 2 = probable
- 3 = possible/unsure

Beaufort Sea State:

- 0 = slick, calm, mirror-like
- 1 = small waves
- 2 = whitecaps 0-33%, waves 1-2 feet
- 3 = whitecaps 33-50%, waves 2-3 feet
- 4 = whitecaps 50-65%, waves 3-5 feet
- 5 = whitecaps >65%, waves >5 feet
- 6 = too rough too survey

Cloud Cover:

- 01 = clear
- 02 = partly cloudy
- 03 = continuous layer of clouds
- 04 = rain
- 05 = haze
- 99 = other, requires comments

Glare

- 0 = No glare
- 1 = 0-25 %
- 2 = 25 -50 %
- 3 = >50%

Visibility:

- 1 = clear to horizon
- 2 = half the distance to the horizon
- 3 = less than half the distance to the horizon

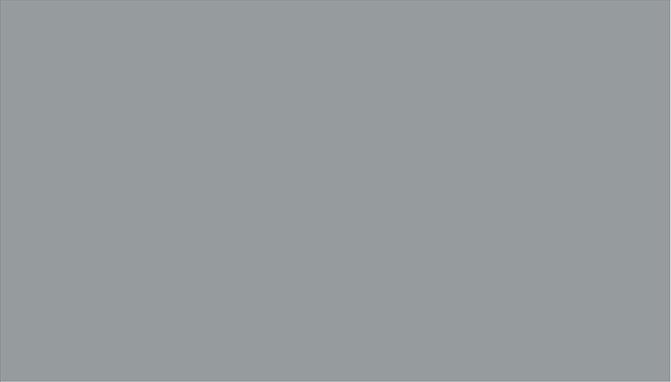
Sighting Cues:

- 1 = Blow
- 2 = Splash
- 3 = Body Part
- 4 = Breach
- 5 = Other (needs comments)

Vertical Angle is given in rough increments of 20 degrees with 1 being directly on the trackline and 4 being anything outside of survey wide to horizon

Horizontal Angle is given assuming the nose of the plane is 0 degrees and directly off the wing is 90 degrees – measurements are taken from 1-180 on each side of the plane.

Species List for Aerial Surveys		
Common Name	Scientific Name	Species Code
Cetaceans		
North Atlantic right whale	<i>Eubalaena glacialis</i>	Egl
Minke whale	<i>Balaenoptera acutorostrata</i>	Bac
sei whale	<i>Balaenoptera borealis</i>	Bbo
fin whale	<i>Balaenoptera physalus</i>	Bph
Brydes whale	<i>Balaenoptera edeni</i>	Bed
humpback whale	<i>Megaptera novaeangliae</i>	Mno
unidentified balaenopterid	Family <i>Balaenopteridae</i>	BALA
sperm whale	<i>Physeter macrocephalus</i>	Pma
pygmy sperm whale	<i>Kogia breviceps</i>	Kbr
dwarf sperm whale	<i>Kogia sima</i>	Ksi
unidentified Kogia	<i>Kogia</i> spp.	KOGI
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	Ham
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Zca
Mesoplodon beaked whale	Genus <i>Mesoplodon</i>	MESO
unidentified beaked whale	Family <i>Ziphiidae</i>	ZIPH
harbor porpoise	<i>Phocoena phocoena</i>	Pph
killer whale	<i>Orcinus orca</i>	Oor
melon-headed whale	<i>Peponocephala electra</i>	Pel
pygmy killer whale	<i>Feresa attenuata</i>	Fat
false killer whale	<i>Pseudorca crassidens</i>	Per
Risso's dolphin	<i>Grampus griseus</i>	Ggr
long-finned pilot whale	<i>Globicephala melas</i>	Gme
short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Gma
unidentified pilot whale	Genus <i>Globicephala</i>	GLOB
rough-toothed dolphin	<i>Steno bredanensis</i>	Sbr
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Lac
Fraser's dolphin	<i>Lagenodelphis hosei</i>	Lho
common dolphin	<i>Delphinus delphis</i>	Dde
bottlenose dolphin	<i>Tursiops truncatus</i>	Ttr
spotted dolphin	<i>Stenella frontalis</i>	Sfr
striped dolphin	<i>Stenella coeruleoalba</i>	Sco
spinner dolphin	<i>Stenella longirostris</i>	Scl
unidentified <i>Stenella</i>	Genus <i>Stenella</i>	STEN
unidentified delphinid	Family <i>Delphinidae</i>	DELP
unidentified cetacean		CETA
Pinnipeds		
gray seal	<i>Halichoerus grypus</i>	Hgr
harbor seal	<i>Phoca vitulina</i>	Pvi
harp seal	<i>Phoca groenlandica</i>	Pgr
hooded seal	<i>Cystophora cristata</i>	Ccr
unidentified phocid	Family <i>Phocidae</i>	PHOC
Sea Turtles		
loggerhead	<i>Caretta caretta</i>	Cca
leatherback	<i>Dermochelys coriacea</i>	Dco
green	<i>Chelonia mydas</i>	Cmy
Kemp's ridley	<i>Lepidochelys kempii</i>	Lke
hawksbill	<i>Eretmochelys imbricata</i>	Eim
unidentified sea turtle		TURT
Other interesting sightings		
ocean sunfish	<i>Mola mola</i>	Mmo
basking shark	<i>Cetorhinus maximus</i>	Cma
whale shark	<i>Rhincodon typus</i>	Rty
manta ray	<i>Manta birostris</i>	Mbi
cownose rays	<i>Rhinoptera bonasus</i>	Rbo



C

Notes on Sighting Summary Sheets



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The Sighting Summary Sheet

The Sighting Summary, adapted from the Sighting Data Sheet used in the field, integrates data gathered in the field with results from lab analyses to provide a full summary of each marine mammal sighting (note – this sheet only deals with marine mammal sightings). A Sighting Summary is to be completed for all sightings, including sightings made while off-effort during transits between survey legs, as well as sighting cues that never led to a sighting that was relocated.

The Sighting Summary sheet is broken into four sections; “Initial Sighting on Track”, “Time and Position of Sighting”, “Final Time and Position of Sighting”, and “Behavior and Additional Comments”. Each section and sub-heading will be detailed below.

Initial Sighting on Track

Time: The time the “break track” GPS way-point was taken.

WP#: GPS way-point number of the break track.

Lat/Long: The latitude and longitude associated with the break track way-point.

Track Line: The track line surveyed when the sighting was made.

On/Off Effort: Whether the sighting was made during an active survey track line (*i.e.* on effort) or during transit BETWEEN track lines (*i.e.* off effort). Sightings made during off effort transit to and from the range are NOT included in the sighting summaries.

Sighting Cue: Whether the initial sighting was a splash, a breach or body part.

Vertical Angle: Vertical “angle” between 1 and 4, the lower edge of view (“1”) to the horizon (“4”). A subjective and relative measure of how far away from the track line the initial sighting occurred.

Horizontal Bearing in Degrees: The horizontal degrees from front to back (0 to 180) at which the sighting occurred.

Observer: Three lettered initial of the observer who made the sighting.

Observer Side: On which side of the plane in the direction of travel the sighting occurred.

Time and Position of Sighting

Time: The time the GPS way-point was taken while relocating animals and circling above.

WP#: GPS way-point number of the sighting.

Lat/Long: The latitude and longitude associated with the way point obtained while circling over animals.

Beaufort Sea State: The sea state observed during the sighting.

Species: Scientific binomial name of the marine mammal species involved in the sighting. When species identity could not be established unequivocally, the next higher taxonomic level to which identity could be established was used. If a cetacean was identified as a dolphin but images obtained during the encounter were not sufficient to establish species ID, the designation “unidentified delphinid” or “*T. truncatus*/*S. frontalis*” is used. If the animal could be ID’d as a cetacean only, then “unidentified cetacean” is used. If a large body was observed but it could not be established whether a cetacean, fish/shark or turtle was involved in the sighting, the designation “unidentified marine vertebrate” is used.

Criteria used to identify species: Which species specific diagnostic features were used in classifying a sighting to species (see information on diagnosis of species).

Best images used for species ID: The images obtained during the sighting that best displayed the features used to establish species.

Numbers (Low/ High/ Best): Low, high, and best estimate of number of animals involved in the sighting.

Calves observed? Whether any calves were observed during the encounter. A conservative measure is used, in that only animals roughly half the size of the associated larger animal (the presumed mother) are designated as calves.

Calculated Distance from Track Line: The distances between the break track waypoint (2.0) and the initial position of each sighting (2.4) is calculated using the online software Scripts Movable

Type (<http://www.movable-type.co.uk/scripts/latlong.html>). Since there is a bias in estimating the location of a group of mobile marine mammals from a fast moving airplane, the distances calculated between break track and sighting are rounded to 0.1 km.

Photographer: Three lettered initials of observer seated in the right camera seat.

Card #: Memory card on which the photos from the particular sighting was made.

Frame Numbers: Starting and ending frame number.

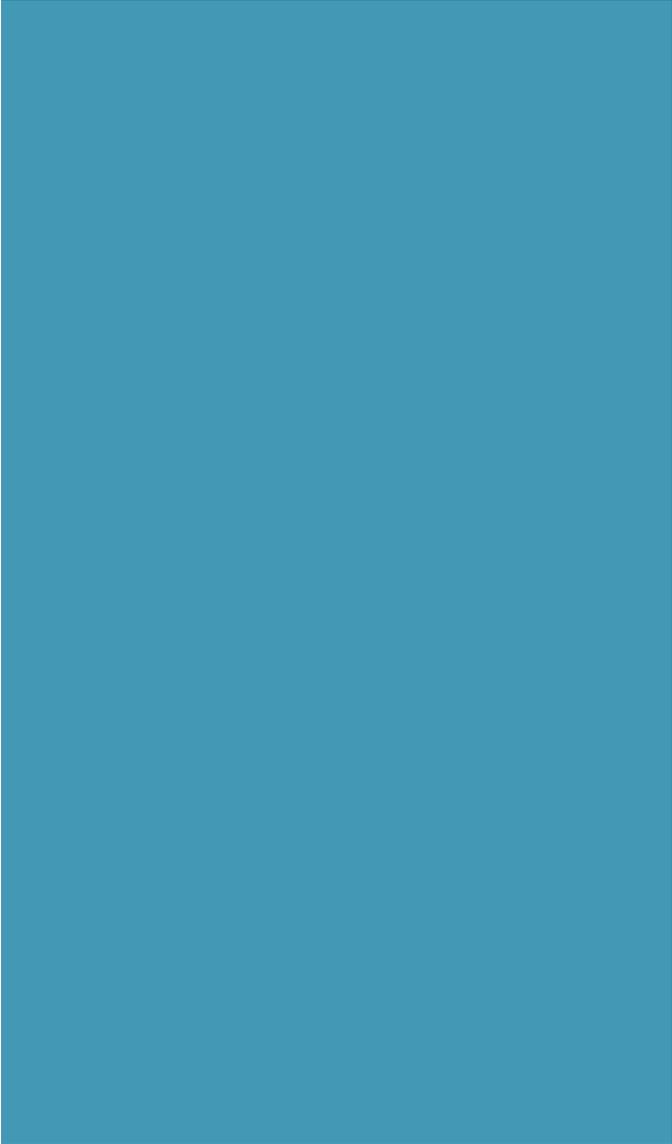
Spacer: Image used to separate sighting to clarify when one sighting ends and the next begins. Image typically of interior of plane or a 45 degree angle shot of the horizon. If taking a shot of the interior of the plane, put the camera focus setting on "manual", take the picture, then immediately set it back to "automatic".

Final Time and Position of Sighting

Time: WP#: Lat: Long: Calculated Distance traveled: → see section above.

Behavior and Additional Comments

Any behavioral notes obtained during the sighting (*e.g.* group formation, relative travel speed, feeding events or presumed copulation attempts, presence of other cetaceans or sharks in or around the animal(s) in the sighting, interaction with inanimate objects such marine debris). This section also includes notes on altitude of the survey plane during the encounter as well as any indications (or lack thereof) of the animal(s) reacting to the presence of the plane.



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Sighting Summary Sheets



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Tuesday, March 8, 2016 Sighting # 1

Initial sighting on Track

Time: 10:45 WP#: 21 Lat: 35.903378 Long: -75.115232
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 42 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:46 WP#: 17 Lat: 35.904140 Long: -75.113762
Species: *Tursiops truncatus* Numbers (Low/High/Best): 25 / 15 / 20
Features used in Species ID: Robust body, gray coloration, white peduncle

Representative images used for Species ID: 6197
Photographer: Erin Frame numbers: 6193 - 6204 Spacer: 6205
Calculated distance from Trackline: 0.20 km

Final Time and Position of Sighting

Time: 10:50 WP#: 18 Lat: 35.904153 Long: -75.107072
Calculated Distance Traveled: 0.60 km

Behavior and Additional Comments

Large scattered group of approximately 20 animals. Animals traveling as singles and pairs.

Tuesday, March 8, 2016 Sighting # 2

Initial sighting on Track

Time: 10:52 WP#: 23 Lat: 35.903449 Long: -75.142701
Vertical Angle: 2 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 42 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:54 WP#: 21 Lat: 35.907115 Long: -75.152278
Species: *Tursiops truncatus* Numbers (Low/High/Best): 7 / 10 / 8
Features used in Species ID: Robust gray body and white peduncle

Representative images used for Species ID: 6209, 6218, 6233
Photographer: Erin Frame numbers: 6206 - 6238 Spacer: 6239
Calculated distance from Trackline: 1.00 km

Final Time and Position of Sighting

Time: 11:00 WP#: 22 Lat: 35.908854 Long: -75.142919
Calculated Distance Traveled: 0.90 km

Behavior and Additional Comments

Seven to ten animals traveling

Tuesday, March 8, 2016 Sighting # 3

Initial sighting on Track

Time: 11:18 WP#: 27 Lat: 35.829755 Long: -74.601819
Vertical Angle: 4 Horizontal Bearing in Degrees: 40 Sighting Cue: Splash
On/Off Effort: On Trackline: 41 Beaufort Sea State: 4
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 11:21 WP#: 28 Lat: 35.824015 Long: -74.620852
Species: *Delphinus delphis* Numbers (Low/High/Best): 2000/5000/3500
Features used in Species ID: Beige lateral pigmentation pattern

Representative images used for Species ID: 6251, 6270, 6271, 6275
Photographer: Erin Frame numbers: 6240 - 6287 Spacer: 6288
Calculated distance from Trackline: 1.83 km

Final Time and Position of Sighting

Time: 11:25 WP#: 29 Lat: 35.826160 Long: -74.612595
Calculated Distance Traveled: 0.78 km

Behavior and Additional Comments

Traveling sub-surface. Group of animals spanned at least two miles wide and a half mile long.

Tuesday, March 8, 2016 Sighting # 4

Initial sighting on Track

Time: 11:42 WP#: 35 Lat: 35.757444 Long: -74.518206
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:45 WP#: 34 Lat: 35.760365 Long: -74.520540
Species: *Tursiops truncatus* Numbers (Low/High/Best): 10 / 15 / 12
Features used in Species ID: Gray robust body and white peduncle

Representative images used for Species ID: 6301
Photographer: Erin Frame numbers: 6289 - 6305 Spacer: 6306
Calculated distance from Trackline: 0.40 km

Final Time and Position of Sighting

Time: 11:54 WP#: 35 Lat: 35.759162 Long: -74.514096
Calculated Distance Traveled: 0.60 km

Behavior and Additional Comments

Milling to close subsurface travel. Small group.

Tuesday, March 8, 2016 Sighting # 5

Initial sighting on Track

Time: 11:56 WP#: 37 Lat: 35.757532 Long: -74.579850
Vertical Angle: 3 Horizontal Bearing in Degrees: 60 Sighting Cue: Splash
On/Off Effort: On Trackline: 40 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:57 WP#: 38 Lat: 35.767769 Long: -74.580143
Species: *Stenella frontalis* Numbers (Low/High/Best): 100 / 150 / 125
Features used in Species ID: Side blaze and spotted

Representative images used for Species ID: 6311, 6313, 6315, 6332, 6333
Photographer: Erin Frame numbers: 6307 - 6364 Spacer: 6365
Calculated distance from Trackline: 1.14 km

Final Time and Position of Sighting

Time: 12:01 WP#: 39 Lat: 35.779388 Long: -74.585198
Calculated Distance Traveled: 1.37 km

Behavior and Additional Comments

Fast travel. Large group of more than 100 animals.

Tuesday, March 8, 2016 Sighting # 6

Initial sighting on Track

Time: 12:03 WP#: 39 Lat: 35.757562 Long: -74.662305
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 12:04 WP#: 41 Lat: 35.758038 Long: -74.658011
Species: *Tursiops truncatus* Numbers (Low/High/Best): 25 / 35 / 30
Features used in Species ID: Gray robust body

Representative images used for Species ID: 6366, 6372
Photographer: Erin Frame numbers: 6366 - 6393 Spacer: 6394
Calculated distance from Trackline: 0.39 km

Final Time and Position of Sighting

Time: 12:06 WP#: 42 Lat: 35.765078 Long: -74.655761
Calculated Distance Traveled: 0.81 km

Behavior and Additional Comments

Fast subsurface travel.

Tuesday, March 8, 2016 Sighting # 7

Initial sighting on Track

Time: 12:10 WP#: 41 Lat: 35.757604 Long: -74.751961
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 12:12 WP#: 45 Lat: 35.762281 Long: -74.744448
Species: *Balaenoptera physalis* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Large sleek body and white pigmentation on mandible

Representative images used for Species ID: 6402
Photographer: Erin Frame numbers: 6395 - 6410 Spacer: 6411
Calculated distance from Trackline: 0.85 km

Final Time and Position of Sighting

Time: 12:17 WP#: 47 Lat: 35.763153 Long: -74.743614
Calculated Distance Traveled: 0.12 km

Behavior and Additional Comments

Whale submerged as fishing vessel approached.

Tuesday, March 8, 2016 Sighting # 8

Initial sighting on Track

Time: 14:09 WP#: 54 Lat: 35.719686 Long: -75.233991
Vertical Angle: 4 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: Off Trackline: NA Beaufort Sea State: 2
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 14:15 WP#: 55 Lat: 35.730777 Long: -75.250326
Species: *Megaptera novaeangliae* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Large white pectoral flippers and black body

Representative images used for Species ID: 6416, 6422, 6425
Photographer: Erin Frame numbers: 6412 - 6429 Spacer: 6430
Calculated distance from Trackline: NA

Final Time and Position of Sighting

Time: 14:19 WP#: 56 Lat: 35.730004 Long: -75.241613
Calculated Distance Traveled: NA

Behavior and Additional Comments

Hanging sub-surface with little movement

Tuesday, March 8, 2016 Sighting # 9

Initial sighting on Track

Time: 14:30 WP#: 61 Lat: 35.688952 Long: -74.834620
Vertical Angle: 3 Horizontal Bearing in Degrees: 110 Sighting Cue: Splash
On/Off Effort: On Trackline: 39 Beaufort Sea State: 3
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 14:47 WP#: 63 Lat: 35.668123 Long: -74.832240
Species: *Megaptera novaeangliae* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Large white pectoral fins and black body

Representative images used for Species ID: 6453, 6455
Photographer: Erin Frame numbers: 6431 - 6458 Spacer: 6459
Calculated distance from Trackline: 2.33 km

Final Time and Position of Sighting

Time: 14:51 WP#: 64 Lat: 35.672995 Long: -74.836449
Calculated Distance Traveled: 0.66 km

Behavior and Additional Comments

Animal dove deep but we were able to relocate it.

Tuesday, March 8, 2016 Sighting # 10

Initial sighting on Track

Time: 15:18 WP#: 55 Lat: 35.619189 Long: -74.735081
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:18 WP#: 71 Lat: 35.619414 Long: -74.740556
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 17 / 13 / 15
Features used in Species ID: No rostrum; black with gray pigmentation pattern cranial to dorsal fin.

Representative images used for Species ID: 6467, 6476, 6481, 6488
Photographer: Erin Frame numbers: 6460 - 6493 Spacer: 6494
Calculated distance from Trackline: 0.50 km

Final Time and Position of Sighting

Time: 15:21 WP#: 72 Lat: 35.619951 Long: -74.744221
Calculated Distance Traveled: 0.34 km

Behavior and Additional Comments

Very tiny calves present in this group.

Tuesday, March 8, 2016 Sighting # 11

Initial sighting on Track

Time: 15:22 WP#: 57 Lat: 35.619318 Long: -74.775272
Vertical Angle: 3 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:24 WP#: 75 Lat: 35.628641 Long: -74.775626
Species: *Delphinus delphis* Numbers (Low/High/Best): 50 / 60 / 55
Features used in Species ID: Beige lateral markings

Representative images used for Species ID: 6496, 6501, 6509, 6510, 6521
Photographer: Erin Frame numbers: 6495 - 6531 Spacer: 6532
Calculated distance from Trackline: 1.04 km

Final Time and Position of Sighting

Time: 15:24 WP#: 76 Lat: 35.628344 Long: -74.768225
Calculated Distance Traveled: 0.67 km

Behavior and Additional Comments

Traveling with at least one calf.

Tuesday, March 8, 2016 Sighting # 12

Initial sighting on Track

Time: 15:25 WP#: 59 Lat: 35.621748 Long: -74.792810
Vertical Angle: 1 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:25 WP#: 79 Lat: 35.624948 Long: -74.786197
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 25 / 35 / 30
Features used in Species ID: No rostrum; black with gray markings cranial to dorsal fin

Representative images used for Species ID: 6534, 6543, 6556
Photographer: Erin Frame numbers: 6533 - 6562 Spacer: 6563
Calculated distance from Trackline: 0.70 km

Final Time and Position of Sighting

Time: 15:27 WP#: 80 Lat: 35.625112 Long: -74.793335
Calculated Distance Traveled: 0.65 km

Behavior and Additional Comments

Calves present within group.

Tuesday, March 8, 2016 Sighting # 13

Initial sighting on Track

Time: 15:29 WP#: 82 Lat: 35.619059 Long: -74.822618
Vertical Angle: 3 Horizontal Bearing in Degrees: 120 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 3
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 15:33 WP#: 83 Lat: 35.620141 Long: -74.818595
Species: *Delphinus delphis* Numbers (Low/High/Best): 8 / 12 / 10
Features used in Species ID: Beige side patch

Representative images used for Species ID: 6569, 6580, 6585
Photographer: Erin Frame numbers: 6564 - 6591 Spacer: 6592
Calculated distance from Trackline: 0.38 km

Final Time and Position of Sighting

Time: 15:36 WP#: 84 Lat: 35.620726 Long: -74.821394
Calculated Distance Traveled: 0.26 km

Behavior and Additional Comments

Fast travel and very evasive.

Tuesday, March 8, 2016 Sighting # 14

Initial sighting on Track

Time: 15:43 WP#: 64 Lat: 35.618655 Long: -75.082061
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:44 WP#: 87 Lat: 35.621575 Long: -75.078776
Species: *Tursiops truncatus* Numbers (Low/High/Best): 16 / 20 / 18
Features used in Species ID: Gray robust body and white peduncle

Representative images used for Species ID: 6593, 6594
Photographer: Erin Frame numbers: 6593 - 6599 Spacer: 6600
Calculated distance from Trackline: 0.44 km

Final Time and Position of Sighting

Time: 15:45 WP#: 88 Lat: 35.623532 Long: -75.073839
Calculated Distance Traveled: 0.50 km

Behavior and Additional Comments

Small scattered group with one subgroup of three animals.

Wednesday, March 9, 2016 Sighting # 9

Initial sighting on Track

Time: 14:44 WP#: 52 Lat: 35.339217 Long: -74.875135
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 34 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 14:46 WP#: 53 Lat: 35.345574 Long: -74.874131
Species: *Tursiops truncatus* Numbers (Low/High/Best): 4 / 4 / 4
Features used in Species ID: Robust, uniform gray, white peduncles

Representative images used for Species ID: 6966, 6973, 7002
Photographer: Tiffany Frame numbers: 6955 - 7011 Spacer: 7012
Calculated distance from Trackline: 0.71 km

Final Time and Position of Sighting

Time: 14:50 WP#: 54 Lat: 35.354603 Long: -74.873350
Calculated Distance Traveled: 1.01 km

Behavior and Additional Comments

Fast travel, regular surfacing

Wednesday, March 9, 2016 Sighting # 10

Initial sighting on Track

Time: 15:20 WP#: 60 Lat: 35.406387 Long: -74.810463
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 4
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 15:27 WP#: 61 Lat: 35.412662 Long: -74.802465
Species: *Tursiops truncatus* Numbers (Low/High/Best): 5 / 5 / 5
Features used in Species ID: Robust, uniform gray, white peduncles

Representative images used for Species ID: N/A
Photographer: N/A Frame numbers: N/A Spacer: N/A
Calculated distance from Trackline: 1.01 km

Final Time and Position of Sighting

Time: 15:31 WP#: 62 Lat: 35.419023 Long: -74.803541
Calculated Distance Traveled: 0.71 km

Behavior and Additional Comments

Traveling, no final location and no photos

Wednesday, May 11, 2016 Sighting # 1

Initial sighting on Track

Time: 9:48 WP#: 7 Lat: 35.406540 Long: -74.344806
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 9:56 WP#: 8 Lat: 35.405117 Long: -74.342950
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Sloped melon and short rostrum/beak and rusty brown coloration.

Representative images used for Species ID: N/A
Photographer: Erin Frame numbers: N/A Spacer: NA
Calculated distance from Trackline: 0.23 km

Final Time and Position of Sighting

Time: 9:57 WP#: 9 Lat: 35.405341 Long: -74.346283
Calculated Distance Traveled: 0.17 km

Behavior and Additional Comments

The animal appeared to be either a juvenile or female based on coloration. Unable to relocate after animal descended on a dive.

Wednesday, May 11, 2016 Sighting # 2

Initial sighting on Track

Time: 9:57 WP#: 11 Lat: 35.405570 Long: -74.367896
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 9:59 WP#: 12 Lat: 35.407067 Long: -74.360518
Species: *Grampus griseus* Numbers (Low/High/Best): 3 / 3 / 3
Features used in Species ID: Blunt melon, white coloration, and scarring patterns

Representative images used for Species ID: 8401, 8411
Photographer: Erin Frame numbers: 8399 - 8412 Spacer: 8413
Calculated distance from Trackline: 2.26 km

Final Time and Position of Sighting

Time: 10:03 WP#: 13 Lat: 35.408100 Long: -74.371624
Calculated Distance Traveled: 1.01 km

Behavior and Additional Comments

Small group of three animals traveling south.

Wednesday, May 11, 2016 Sighting # 3

Initial sighting on Track

Time: 10:17 WP#: 15 Lat: 35.406050 Long: -74.862978
Vertical Angle: 3 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 4
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 10:18 WP#: 16 Lat: 35.405698 Long: -74.856217
Species: *Tursiops truncatus* Numbers (Low/High/Best): 8 / 12 / 10
Features used in Species ID: White peduncle, robust body

Representative images used for Species ID: 8414
Photographer: Erin Frame numbers: 8414 - 8417 Spacer: 8418
Calculated distance from Trackline: 0.61 km

Final Time and Position of Sighting

Time: 10:32 WP#: 17 Lat: 35.400811 Long: -74.869475
Calculated Distance Traveled: 1.32 km

Behavior and Additional Comments

Traveling south/southwest, very evasive, splitting off from two groups

Wednesday, May 11, 2016 Sighting # 4

Initial sighting on Track

Time: 10:40 WP#: 21 Lat: 35.405548 Long: -75.150373
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 2
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 10:41 WP#: 22 Lat: 35.403096 Long: -75.154364
Species: *Tursiops truncatus* Numbers (Low/High/Best): 18 / 15 / 16
Features used in Species ID: Robust gray body, white peduncle

Representative images used for Species ID: 8431
Photographer: Erin Frame numbers: 8419 - 8440 Spacer: 8441
Calculated distance from Trackline: 0.45 km

Final Time and Position of Sighting

Time: 10:53 WP#: 23 Lat: 35.420138 Long: -75.157065
Calculated Distance Traveled: 1.91 km

Behavior and Additional Comments

Three groups comprised of 5 - 6 animals in each group, traveling north

Wednesday, May 11, 2016 Sighting # 5

Initial sighting on Track

Time: 11:14 WP#: 31 Lat: 35.478238 Long: -74.819918
Vertical Angle: 3 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:16 WP#: 32 Lat: 35.475495 Long: -74.817099
Species: *Tursiops truncatus* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Robust gray body and white peduncle

Representative images used for Species ID: 8447, 8448
Photographer: Erin Frame numbers: 8442 - 8450 Spacer: 8450
Calculated distance from Trackline: 0.39 km

Final Time and Position of Sighting

Time: 11:16 WP#: 33 Lat: 35.468629 Long: -74.823892
Calculated Distance Traveled: 0.98 km

Behavior and Additional Comments

Very evasive

Wednesday, May 11, 2016 Sighting # 6

Initial sighting on Track

Time: 11:18 WP#: 35 Lat: 35.475286 Long: -74.786179
Vertical Angle: 4 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 4
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 11:18 WP#: 36 Lat: 35.480930 Long: -74.791223
Species: *Tursiops truncatus* Numbers (Low/High/Best): 75 / 150 / 125
Features used in Species ID: Robust gray body and white peduncle

Representative images used for Species ID: 8453, 8457, 8474
Photographer: Erin Frame numbers: 8451 - 8477 Spacer: 8478
Calculated distance from Trackline: 0.78 km

Final Time and Position of Sighting

Time: 11:25 WP#: 37 Lat: 35.505914 Long: -74.791604
Calculated Distance Traveled: 2.77 km

Behavior and Additional Comments

Large group traveling east just below the surface, two smaller groups following

Wednesday, May 11, 2016 Sighting # 7

Initial sighting on Track

Time: 11:28 WP#: 39 Lat: 35.475309 Long: -74.719508
Vertical Angle: 2 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:30 WP#: 40 Lat: 35.474951 Long: -74.721885
Species: *Tursiops truncatus* Numbers (Low/High/Best): 20 / 30 / 25
Features used in Species ID: Robust gray body, white peduncle

Representative images used for Species ID: 8486
Photographer: Erin Frame numbers: 8479 - 8489 Spacer: 8489
Calculated distance from Trackline: 0.22 km

Final Time and Position of Sighting

Time: 11:30 WP#: 41 Lat: 35.472769 Long: -74.718411
Calculated Distance Traveled: 0.39 km

Behavior and Additional Comments

One large group of animals traveling southeast with scattered animals following behind

Wednesday, May 11, 2016 Sighting # 8

Initial sighting on Track

Time: 11:54 WP#: 45 Lat: 35.553174 Long: -74.745488
Vertical Angle: 3 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 4
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 11:55 WP#: 46 Lat: 35.543343 Long: -74.739988
Species: *Tursiops truncatus* Numbers (Low/High/Best): 35 / 45 / 40
Features used in Species ID: White peduncle, robust gray body

Representative images used for Species ID: 8496, 8510
Photographer: Erin Frame numbers: 8490 - 8514 Spacer: 8515
Calculated distance from Trackline: 1.20 km

Final Time and Position of Sighting

Time: 12:00 WP#: 47 Lat: 35.542148 Long: -74.742871
Calculated Distance Traveled: 0.29 km

Behavior and Additional Comments

Two groups of dolphins each comprised of approximately 15 or more animals, fast subsurface travel

Wednesday, May 11, 2016 Sighting # 9

Initial sighting on Track

Time: 12:01 WP#: 50 Lat: 35.55358 Long: -74.780533
Vertical Angle: 2 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 12:05 WP#: 51 Lat: 35.553318 Long: -74.783131
Species: *Tursiops truncatus* Numbers (Low/High/Best): 50 / 75 / 65
Features used in Species ID: White peduncle, robust gray body

Representative images used for Species ID: 8529, 8545, 8548, 8559
Photographer: Erin Frame numbers: 8516 - 8562 Spacer: 8563
Calculated distance from Trackline: 0.24 km

Final Time and Position of Sighting

Time: 12:06 WP#: 52 Lat: 35.555185 Long: -74.785289
Calculated Distance Traveled: 0.29 km

Behavior and Additional Comments

Very playful group

Wednesday, May 11, 2016 Sighting # 10

Initial sighting on Track

Time: 12:07 WP#: 54 Lat: 35.559917 Long: -74.826675
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Splash
On/Off Effort: On Trackline: 37 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 12:10 WP#: 55 Lat: 35.550182 Long: -74.820067
Species: *Delphinus delphis* Numbers (Low/High/Best): 800/1200/1000
Features used in Species ID: Golden lateral patch, dark gray 'saddle pattern' with a point below the dorsal fin

Representative images used for Species ID: 8573, 8583
Photographer: Erin Frame numbers: 8564 - 8610 Spacer: 8611
Calculated distance from Trackline: 1.24 km

Final Time and Position of Sighting

Time: 12:13 WP#: 56 Lat: 35.551125 Long: -74.825829
Calculated Distance Traveled: 0.53 km

Behavior and Additional Comments

Super group of approximately 1000 animals, at least six small subgroups following

Wednesday, May 11, 2016 Sighting # 11

Initial sighting on Track

Time: 14:48 WP#: 72 Lat: 35.612336 Long: -74.786774
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:53 WP#: 73 Lat: 35.628505 Long: -74.66254
Species: *Tursiops truncatus* Numbers (Low/High/Best): 25 / 45 / 35
Features used in Species ID: White peduncle, robust body

Representative images used for Species ID: 8664
Photographer: Erin Frame numbers: 8655 - 8666 Spacer: N/A
Calculated distance from Trackline: 2.58 km

Final Time and Position of Sighting

Time: 14:55 WP#: 74 Lat: 35.618419 Long: -74.753132
Calculated Distance Traveled: 1.63 km

Behavior and Additional Comments

Animals congregating near the western margin of the gulf stream, double sighting, no spacer

Wednesday, May 11, 2016 Sighting # 12

Initial sighting on Track

Time: 14:48 WP#: 72 Lat: 35.612336 Long: -74.786774
Vertical Angle: 3 Horizontal Bearing in Degrees: 120 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:53 WP#: 73 Lat: 35.628505 Long: -74.766254
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 12 / 18 / 16
Features used in Species ID: Blunt head, short pectorals, dark body

Representative images used for Species ID: 8672, 8673, 8680
Photographer: Erin Frame numbers: 8667 - 8682 Spacer: 8682
Calculated distance from Trackline: N/A

Final Time and Position of Sighting

Time: 14:55 WP#: 74 Lat: 35.618419 Long: -74.753132
Calculated Distance Traveled: NA

Behavior and Additional Comments

Sighting occurred while on sighting # 11, calculated distances would be inaccurate

Wednesday, May 11, 2016 Sighting # 13

Initial sighting on Track

Time: 14:55 WP#: 75 Lat: 35.618358 Long: -74.750392
Vertical Angle: 2 Horizontal Bearing in Degrees: 60 Sighting Cue: Blow
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:55 WP#: 76 Lat: 35.617345 Long: -74.740073
Species: *Tursiops truncatus* Numbers (Low/High/Best): 50 / 100 / 75
Features used in Species ID: Uniform gray, robust, white peduncle

Representative images used for Species ID: 8685, 8689, 8695
Photographer: Erin Frame numbers: 8683 - 8698 Spacer: 8698
Calculated distance from Trackline: 0.94 km

Final Time and Position of Sighting

Time: 14:57 WP#: 77 Lat: 35.616956 Long: -74.746432
Calculated Distance Traveled: 0.58 km

Behavior and Additional Comments

Traveling

Wednesday, May 11, 2016 Sighting # 14

Initial sighting on Track

Time: 15:00 WP#: 80 Lat: 35.620139 Long: -74.641197
Vertical Angle: 3 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 15:01 WP#: 81 Lat: 35.628698 Long: -74.638835
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Dark body, blunt melon, short pectorals

Representative images used for Species ID: 8702
Photographer: Erin Frame numbers: 8699 - 8711 Spacer: 8711
Calculated distance from Trackline: 0.98 km

Final Time and Position of Sighting

Time: 15:03 WP#: 82 Lat: 35.631307 Long: -74.640866
Calculated Distance Traveled: 0.34 km

Behavior and Additional Comments

A pair of animals, slow travel

Wednesday, May 11, 2016 Sighting # 15

Initial sighting on Track

Time: 15:16 WP#: 86 Lat: 35.676472 Long: -74.427152
Vertical Angle: 4 Horizontal Bearing in Degrees: 40 Sighting Cue: Blow
On/Off Effort: On Trackline: 39 Beaufort Sea State: 3
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 15:23 WP#: 87 Lat: 35.660683 Long: -74.420553
Species: *Physeter macrocephalus* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Large, blunt head, gray body, forward blow

Representative images used for Species ID: 8717, 8734, 8739, 8743, 8755
Photographer: Erin Frame numbers: 8712 - 8758 Spacer: 8758
Calculated distance from Trackline: 1.85 km

Final Time and Position of Sighting

Time: 15:23 WP#: 88 Lat: 35.663330 Long: -74.420698
Calculated Distance Traveled: 0.29 km

Behavior and Additional Comments

Traveling fast at the surface, took a very slow decent, very rotund possibly pregnant female?

Wednesday, May 11, 2016 Sighting # 16

Initial sighting on Track

Time: 15:31 WP#: 90 Lat: 35.687424 Long: -74.670504
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:31 WP#: 91 Lat: 35.695457 Long: -74.664534
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 16 / 20 / 18
Features used in Species ID: Dark body, blunt melon, short pectorals

Representative images used for Species ID: 8768
Photographer: Erin Frame numbers: 8759 - 8772 Spacer: 8772
Calculated distance from Trackline: 1.04 km

Final Time and Position of Sighting

Time: 15:34 WP#: 92 Lat: 35.701334 Long: -74.663952
Calculated Distance Traveled: 0.66 km

Behavior and Additional Comments

At least 1 calf present

Wednesday, May 11, 2016 Sighting # 17

Initial sighting on Track

Time: 15:37 WP#: 94 Lat: 35.686973 Long: -74.755441
Vertical Angle: 1 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:40 WP#: 95 Lat: 35.692026 Long: -74.744156
Species: *Tursiops truncatus* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Uniform gray, robust, white peduncle

Representative images used for Species ID: 8773
Photographer: Erin Frame numbers: 8773 - 8774 Spacer: 8774
Calculated distance from Trackline: 1.16 km

Final Time and Position of Sighting

Time: 15:42 WP#: 96 Lat: 35.723236 Long: -74.741785
Calculated Distance Traveled: 3.48 km

Behavior and Additional Comments

Single animal traveling

Wednesday, May 11, 2016 Sighting # 18

Initial sighting on Track

Time: 15:45 WP#: 98 Lat: 35.688092 Long: -74.795572
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:45 WP#: 99 Lat: 35.698572 Long: -74.803952
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 75 / 95 / 85
Features used in Species ID: Dark body, blunt melon, short pectorals

Representative images used for Species ID: 8784, 8792, 8794
Photographer: Erin Frame numbers: 8775 - 8795 Spacer: 8796
Calculated distance from Trackline: 1.39 km

Final Time and Position of Sighting

Time: N/A WP#: N/A Lat: N/A Long: N/A
Calculated Distance Traveled: N/A

Behavior and Additional Comments

This was the first of 4 different species sightings in one area

Wednesday, May 11, 2016 Sighting # 19

Initial sighting on Track

Time: 15:45 WP#: 98 Lat: 35.688092 Long: -74.795572
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:52 WP#: 100 Lat: 35.694851 Long: -74.769897
Species: *Tursiops truncatus* Numbers (Low/High/Best): 10 / 20 / 15
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: N/A
Photographer: N/A Frame numbers: N/A Spacer: N/A
Calculated distance from Trackline: N/A

Final Time and Position of Sighting

Time: N/A WP#: N/A Lat: N/A Long: N/A
Calculated Distance Traveled: N/A

Behavior and Additional Comments

Initial sighting on track point not accurate, multiple sightings of different species in the same area
Traveling

Wednesday, May 11, 2016 Sighting # 20

Initial sighting on Track

Time: 15:45 WP#: 98 Lat: 35.688092 Long: -74.795572
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:54 WP#: 101 Lat: 35.700041 Long: -74.773654
Species: *Grampus griseus* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Gray and white body, blunt melon, cleft in middle of melon

Representative images used for Species ID: N/A
Photographer: N/A Frame numbers: N/A Spacer: N/A
Calculated distance from Trackline: N/A

Final Time and Position of Sighting

Time: N/A WP#: N/A Lat: N/A Long: N/A
Calculated Distance Traveled: N/A

Behavior and Additional Comments

Initial sighting on track not accurate, sighting was with multiple other species sightings, no photos

Wednesday, May 11, 2016 Sighting # 21

Initial sighting on Track

Time: 15:47 WP#: 98 Lat: 35.688092 Long: -74.795572
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: Off Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:55 WP#: 102 Lat: 35.692449 Long: -74.758884
Species: *Unidentified Mesoplodon* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Uniform gray, long body, short pectorals

Representative images used for Species ID: N/A
Photographer: N/A Frame numbers: N/A Spacer: N/A
Calculated distance from Trackline: N/A

Final Time and Position of Sighting

Time: 16:03 WP#: 103 Lat: 35.694468 Long: -74.744900
Calculated Distance Traveled: 1.28 km

Behavior and Additional Comments

Initial sighting on track is not accurate, sighting was seen with multiple other species sightings
No photos, animals were at the surface but dove after the first full pass

Wednesday, May 11, 2016 Sighting # 22

Initial sighting on Track

Time: 16:07 WP#: 105 Lat: 35.687125 Long: -74.818520
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 16:08 WP#: 106 Lat: 35.685165 Long: -74.811789
Species: *Tursiops truncatus* Numbers (Low/High/Best): 15 / 25 / 20
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 8798, 8823
Photographer: Erin Frame numbers: 8797 - 8823 Spacer: 8824
Calculated distance from Trackline: 0.65 km

Final Time and Position of Sighting

Time: 16:16 WP#: 109 Lat: 35.679760 Long: -74.784304
Calculated Distance Traveled: N/A

Behavior and Additional Comments

Slow travel, observed near Gma
Final Time and Position not accurate

Wednesday, May 11, 2016 Sighting # 23

Initial sighting on Track

Time: 16:07 WP#: 105 Lat: 35.687125 Long: -74.818520
Vertical Angle: 3 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 16:12 WP#: 107 Lat: 35.682919 Long: -74.789942
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 15 / 25 / 20
Features used in Species ID: Blunt head, dark body, short pectorals

Representative images used for Species ID: 8811
Photographer: 8813 Frame numbers: 8799 - 8815 Spacer: 8825
Calculated distance from Trackline: N/A

Final Time and Position of Sighting

Time: 16:16 WP#: 109 Lat: 35.679760 Long: -74.784304
Calculated Distance Traveled: 0.62 km

Behavior and Additional Comments

Initial sighting on track not accurate

Wednesday, May 11, 2016 Sighting # 24

Initial sighting on Track

Time: 16:21 WP#: 116 Lat: 35.687383 Long: -74.831551
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 16:24 WP#: 117 Lat: 35.689577 Long: -74.828139
Species: *Tursiops truncatus* Numbers (Low/High/Best): 35 / 45 / 40
Features used in Species ID: Uniform gray, robust, white peduncle

Representative images used for Species ID: 8826, 8831, 8840, 8845
Photographer: Ryan Frame numbers: 8826 - 8846 Spacer: 8847
Calculated distance from Trackline: 0.39 km

Final Time and Position of Sighting

Time: 16:25 WP#: 118 Lat: 35.694722 Long: -74.819235
Calculated Distance Traveled: 0.99 km

Behavior and Additional Comments

Fast travel

Thursday, May 12, 2016 Sighting # 1

Initial sighting on Track

Time: 12:33 WP#: 4 Lat: 35.758827 Long: -74.825138
Vertical Angle: 3 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 12:35 WP#: 5 Lat: 35.767292 Long: -74.812490
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 20 / 30 / 25
Features used in Species ID: Blunt head, dark body, short pectorals

Representative images used for Species ID: 8852, 8868
Photographer: Tiffany Frame numbers: 8848 - 8876 Spacer: 8877
Calculated distance from Trackline: 1.48 km

Final Time and Position of Sighting

Time: 12:40 WP#: 6 Lat: 35.775672 Long: -74.808003
Calculated Distance Traveled: 1.02 km

Behavior and Additional Comments

M/C pair, traveling north, multiple groups

Thursday, May 12, 2016 Sighting # 2

Initial sighting on Track

Time: 12:42 WP#: 8 Lat: 35.758221 Long: -74.792807
Vertical Angle: 3 Horizontal Bearing in Degrees: 120 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 2
Observer: Tiffany Observer side: Right

Actual Time and Position of Sighting

Time: 12:44 WP#: 9 Lat: 35.751889 Long: -74.785531
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 12 / 18 / 15
Features used in Species ID: Blunt head, dark body, short pectoral

Representative images used for Species ID: 8883
Photographer: Tiffany Frame numbers: 8878 - 8902 Spacer: 8903
Calculated distance from Trackline: 0.96 km

Final Time and Position of Sighting

Time: 12:44 WP#: 10 Lat: 35.756420 Long: -74.788897
Calculated Distance Traveled: 0.59 km

Behavior and Additional Comments

Traveling, multiple groups

Thursday, May 12, 2016 Sighting # 3

Initial sighting on Track

Time: 13:43 WP#: 26 Lat: 35.553318 Long: -74.693522
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 13:43 WP#: 26 Lat: 35.553318 Long: -74.693522
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 6 / 10 / 8
Features used in Species ID: Blunt head, dark body, short pectorals

Representative images used for Species ID: N/A
Photographer: N/A Frame numbers: N/A Spacer: N/A
Calculated distance from Trackline: N/A

Final Time and Position of Sighting

Time: 13:53 WP#: 27 Lat: 35.558402 Long: -74.698137
Calculated Distance Traveled: N/A

Behavior and Additional Comments

Group not relocated, no photos

Thursday, May 12, 2016 Sighting # 4

Initial sighting on Track

Time: 13:54 WP#: 29 Lat: 35.552761 Long: -74.672334
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 13:56 WP#: 30 Lat: 35.555604 Long: -74.675995
Species: *Tursiops truncatus* Numbers (Low/High/Best): 12 / 20 / 16
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 8922, 8927, 8931, 8935, 8956
Photographer: Tiffany Frame numbers: 8904 - 8971 Spacer: 8972
Calculated distance from Trackline: 0.46 km

Final Time and Position of Sighting

Time: 14:07 WP#: 31 Lat: 35.563476 Long: -74.666764
Calculated Distance Traveled: 1.21 km

Behavior and Additional Comments

Traveling subsurface, 2 groups, regular surfacing

Thursday, May 12, 2016 Sighting # 5

Initial sighting on Track

Time: 14:42 WP#: 39 Lat: 35.406993 Long: -74.394169
Vertical Angle: 4 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 35 Beaufort Sea State: 2
Observer: Tiffany Observer side: Right

Actual Time and Position of Sighting

Time: 14:42 WP#: 41 Lat: 35.395043 Long: -74.399625
Species: *Physeter macrocephalus* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Blunt head, forward blow, large body, wrinkly

Representative images used for Species ID: 9016, 9032, 9086
Photographer: Tiffany Frame numbers: 8973 - 9250 Spacer: 9251
Calculated distance from Trackline: 1.42 km

Final Time and Position of Sighting

Time: 14:54 WP#: 43 Lat: 35.388528 Long: -74.409459
Calculated Distance Traveled: N/A

Behavior and Additional Comments

Logging at the surface, mouth open, Scl swimming around and Pma and through mouth.
Final time and position not accurate b/c we picked up some more Scl in the distance

Thursday, May 12, 2016 Sighting # 6

Initial sighting on Track

Time: 14:42 WP#: 39 Lat: 35.406993 Long: -74.394169
Vertical Angle: 4 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 35 Beaufort Sea State: 2
Observer: Tiffany Observer side: Right

Actual Time and Position of Sighting

Time: 14:51 WP#: 42 Lat: 35.386402 Long: -74.410363
Species: *Stenella clymene* Numbers (Low/High/Best): 75 / 100 / 85
Features used in Species ID: Small, black mustache on rostrum

Representative images used for Species ID: 9200, 9206, 9208
Photographer: Tiffany Frame numbers: 8973 - 9250 Spacer: 9251
Calculated distance from Trackline: 2.72 km

Final Time and Position of Sighting

Time: 14:54 WP#: 43 Lat: 35.388528 Long: -74.409459
Calculated Distance Traveled: 0.25 km

Behavior and Additional Comments

Two large groups, one swimming around Pma and one off in the distance

Saturday, June 11, 2016 Sighting # 1

Initial sighting on Track

Time: 14:05 WP#: 14 Lat: 35.550391 Long: 74.726445
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 5
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:18 WP#: 16 Lat: 35.550935 Long: 74.733622
Species: *Unidentified Delphinid* Numbers (Low/High/Best): 5 / 15 / 10
Features used in Species ID: Unidentified delphinid

Representative images used for Species ID: NA
Photographer: Erin Frame numbers: NA Spacer: NA
Calculated distance from Trackline: 0.65 km

Final Time and Position of Sighting

Time: 14:18 WP#: 17 Lat: 35.824721 Long: -74.806720
Calculated Distance Traveled: 0.94 km

Behavior and Additional Comments

Very high sea state; unable to relocate animals

Thursday, July 7, 2016 Sighting # 1

Initial sighting on Track

Time: 9:24 WP#: 8 Lat: 36.041765 Long: -74.715977
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 44 Beaufort Sea State: 5
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 9:26 WP#: 9 Lat: 36.038578 Long: -74.708082
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 10 / 18 / 15
Features used in Species ID: Black body, blunt head

Representative images used for Species ID: 758, 771
Photographer: Ryan Frame numbers: 747 - 781 Spacer: 782
Calculated distance from Trackline: 0.79 km

Final Time and Position of Sighting

Time: 9:31 WP#: 10 Lat: 36.030069 Long: -74.710265
Calculated Distance Traveled: 0.97 km

Behavior and Additional Comments

Two groups, scattered, fast travel SE

Thursday, July 7, 2016 Sighting # 2

Initial sighting on Track

Time: 10:24 WP#: 21 Lat: 35.903278 Long: -74.785233
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 42 Beaufort Sea State: 5
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 10:25 WP#: 22 Lat: 35.901275 Long: -74.784248
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 8 / 8 / 8
Features used in Species ID: Black body, blunt head

Representative images used for Species ID: 793, 800
Photographer: Ryan Frame numbers: 783 - 804 Spacer: 805
Calculated distance from Trackline: 0.24 km

Final Time and Position of Sighting

Time: 10:31 WP#: 23 Lat: 35.896758 Long: -74.790165
Calculated Distance Traveled: 0.73 km

Behavior and Additional Comments

Fast travel

Wednesday, July 20, 2016 Sighting # 1

Initial sighting on Track

Time: 9:33 WP#: 4 Lat: 35.337929 Long: -74.795620
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 34 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 9:34 WP#: 5 Lat: 35.340601 Long: -74.792767
Species: *Physeter macrocephalus* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Large gray body, blunt melon, forward blow

Representative images used for Species ID: 0945, 0949, 0956, 0963, 0969
Photographer: Ryan Frame numbers: 943 - 986 Spacer: 987
Calculated distance from Trackline: 0.39 km

Final Time and Position of Sighting

Time: 9:36 WP#: 6 Lat: 35.341349 Long: -74.795359
Calculated Distance Traveled: 0.25 km

Behavior and Additional Comments

Logging side by side, mouth open

Wednesday, July 20, 2016 Sighting # 2

Initial sighting on Track

Time: 9:39 WP#: 8 Lat: 35.337497 Long: -74.695299
Vertical Angle: 4 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 34 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 9:40 WP#: 9 Lat: 35.350404 Long: -74.709804
Species: *Mesoplodon europaeus* Numbers (Low/High/Best): 12 / 12 / 12
Features used in Species ID: Large body, short pectorals, tiger stripe ridge down back, teeth
erupted from center of lower jaw

Representative images used for Species ID: 0991, 1004, 1009, 1018, 1021, 1026
Photographer: Ryan Frame numbers: 988 - 1038 Spacer: 1039
Calculated distance from Trackline: 1.95 km

Final Time and Position of Sighting

Time: 9:47 WP#: 10 Lat: 35.352361 Long: -74.712842
Calculated Distance Traveled: 0.35 km

Behavior and Additional Comments

Slow surfacings, half dove when we flew over them, the others dispersed and started traveling faster

Wednesday, July 20, 2016 Sighting # 3

Initial sighting on Track

Time: 10:34 WP#: 20 Lat: 35.475094 Long: -74.795410
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 10:37 WP#: 21 Lat: 35.473633 Long: -74.796467
Species: *Tursiops truncatus* Numbers (Low/High/Best): 4 / 4 / 4
Features used in Species ID: Robust, gray body, white peduncles

Representative images used for Species ID: 1043
Photographer: Ryan Frame numbers: 1040 - 1053 Spacer: 1054
Calculated distance from Trackline: 0.19 km

Final Time and Position of Sighting

Time: 10:38 WP#: 22 Lat: 35.478602 Long: -74.802349
Calculated Distance Traveled: 0.77 km

Behavior and Additional Comments

Traveling north, white peduncles

Wednesday, July 20, 2016 Sighting # 4

Initial sighting on Track

Time: 10:41 WP#: 24 Lat: 35.474283 Long: -74.730182
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 10:43 WP#: 25 Lat: 35.478192 Long: -74.726763
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 7 / 7 / 7
Features used in Species ID: White to golden brown body, short pectorals

Representative images used for Species ID: N/A
Photographer: Ryan Frame numbers: N/A Spacer: N/A
Calculated distance from Trackline: 0.53 km

Final Time and Position of Sighting

Time: 10:56 WP#: 27 Lat: 35.465697 Long: -74.743374
Calculated Distance Traveled: 2.05 km

Behavior and Additional Comments

One individual was moving its head around, they dove when we flew over, heading south, another group popped up in the distance and were traveling fast, no photos

Wednesday, July 20, 2016 Sighting # 5

Initial sighting on Track

Time: 13:52 WP#: 41 Lat: 35.825779 Long: -75.002030
Vertical Angle: 3 Horizontal Bearing in Degrees: 60 Sighting Cue: Splash
On/Off Effort: On Trackline: 41 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 13:53 WP#: 42 Lat: 35.835383 Long: -74.994572
Species: *Stenella frontalis* Numbers (Low/High/Best): 45 / 60 / 50
Features used in Species ID: Alternating light and dark pattern, spotting down body

Representative images used for Species ID: 1057, 1061
Photographer: Ryan Frame numbers: 1055 - 1090 Spacer: 1091
Calculated distance from Trackline: 1.26 km

Final Time and Position of Sighting

Time: 13:55 WP#: 43 Lat: 35.841689 Long: -74.997191
Calculated Distance Traveled: 0.74 km

Behavior and Additional Comments

Traveling north, slow subsurface and surface travel

Wednesday, July 20, 2016 Sighting # 6

Initial sighting on Track

Time: 13:59 WP#: 46 Lat: 35.825757 Long: -74.868131
Vertical Angle: 1 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 2
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 14:01 WP#: 47 Lat: 35.826651 Long: -74.862837
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 400 / 600 / 500
Features used in Species ID: Dark body, blunt head, short pectorals

Representative images used for Species ID: 1104, 1108, 1116, 1123, 1138
Photographer: Ryan Frame numbers: 1092 - 1141 Spacer: 1142
Calculated distance from Trackline: 0.49 km

Final Time and Position of Sighting

Time: 14:04 WP#: 48 Lat: 35.830407 Long: -74.869097
Calculated Distance Traveled: 0.70 km

Behavior and Additional Comments

Milling, multiple groups, 1 large dense group

Wednesday, July 20, 2016 Sighting # 7

Initial sighting on Track

Time: 14:07 WP#: 51 Lat: 35.826246 Long: -74.752935
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 14:08 WP#: 52 Lat: 35.827393 Long: -74.754764
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 7 / 12 / 10
Features used in Species ID: Dark body, blunt head, short pectorals

Representative images used for Species ID: 1145, 1153, 1157, 1162
Photographer: Ryan Frame numbers: 1143 - 1171 Spacer: 1172
Calculated distance from Trackline: 0.21 km

Final Time and Position of Sighting

Time: 14:15 WP#: 53 Lat: 35.829231 Long: -74.760560
Calculated Distance Traveled: 0.56 km

Behavior and Additional Comments

Milling

Wednesday, July 20, 2016 Sighting # 8

Initial sighting on Track

Time: 14:20 WP#: 57 Lat: 35.825966 Long: -74.617936
Vertical Angle: 4 Horizontal Bearing in Degrees: 45 Sighting Cue: Splash
On/Off Effort: On Trackline: 41 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 14:21 WP#: 58 Lat: 35.848821 Long: -74.609718
Species: *Tursiops truncatus* Numbers (Low/High/Best): 25 / 35 / 30
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 1196, 1197
Photographer: Ryan Frame numbers: 1173 - 1199 Spacer: 1200
Calculated distance from Trackline: 2.65 km

Final Time and Position of Sighting

Time: 14:24 WP#: 59 Lat: 35.860476 Long: -74.606271
Calculated Distance Traveled: 1.33 km

Behavior and Additional Comments

Fast travel north, quick surfacing

Wednesday, July 20, 2016 Sighting # 9

Initial sighting on Track

Time: 14:25 WP#: 60 Lat: 35.828653 Long: -74.580914
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: Off Trackline: 41 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 14:28 WP#: 61 Lat: 35.836423 Long: -74.579635
Species: *Stenella frontalis* Numbers (Low/High/Best): 30 / 50 / 40
Features used in Species ID: Alternating light and dark pattern down body, spotting

Representative images used for Species ID: 1201, 1205, 1206
Photographer: Ryan Frame numbers: 1201 - 1224 Spacer: 1225
Calculated distance from Trackline: 0.87 km

Final Time and Position of Sighting

Time: 14:29 WP#: 62 Lat: 35.835912 Long: -74.575861
Calculated Distance Traveled: 0.34 km

Behavior and Additional Comments

Traveling fast, darting

Wednesday, July 20, 2016 Sighting # 10

Initial sighting on Track

Time: 14:45 WP#: 66 Lat: 35.758489 Long: -74.552651
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 14:47 WP#: 67 Lat: 35.758046 Long: -74.553086
Species: *Tursiops truncatus* Numbers (Low/High/Best): 4 / 4 / 4
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 1235
Photographer: Ryan Frame numbers: 1226 - 1237 Spacer: 1238
Calculated distance from Trackline: 0.06 km

Final Time and Position of Sighting

Time: 14:50 WP#: 68 Lat: 35.765796 Long: -74.549749
Calculated Distance Traveled: 0.91 km

Behavior and Additional Comments

Traveling fast

Wednesday, July 20, 2016 Sighting # 11

Initial sighting on Track

Time: 14:57 WP#: 70 Lat: 35.758951 Long: -74.657570
Vertical Angle: 2 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 14:54 WP#: 71 Lat: 35.767475 Long: -74.657636
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Robust, golden brown, white

Representative images used for Species ID: 1255, 1260, 1264
Photographer: Ryan Frame numbers: 1239 - 1271 Spacer: 1272
Calculated distance from Trackline: 0.95 km

Final Time and Position of Sighting

Time: 14:55 WP#: 72 Lat: 35.767211 Long: -74.658963
Calculated Distance Traveled: 0.12 km

Behavior and Additional Comments

Logging at the surface

Wednesday, July 20, 2016 Sighting # 12

Initial sighting on Track

Time: 15:20 WP#: 78 Lat: 35.687549 Long: -74.786974
Vertical Angle: 3 Horizontal Bearing in Degrees: 100 Sighting Cue: Blow
On/Off Effort: On Trackline: 39 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 15:23 WP#: 79 Lat: 35.701961 Long: -74.793453
Species: *Tursiops truncatus* Numbers (Low/High/Best): 18 / 30 / 25
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 1276, 1283, 1285, 1287
Photographer: Ryan Frame numbers: 1273 - 1288 Spacer: 1289
Calculated distance from Trackline: 1.71 km

Final Time and Position of Sighting

Time: 15:23 WP#: 80 Lat: 35.700370 Long: -74.794302
Calculated Distance Traveled: 0.19 km

Behavior and Additional Comments

Scattered, traveling north through sargassum

Wednesday, July 20, 2016 Sighting # 13

Initial sighting on Track

Time: 15:48 WP#: 85 Lat: 35.620704 Long: -74.652358
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Blow
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 15:49 WP#: 86 Lat: 35.616305 Long: -74.649396
Species: *Tursiops truncatus* Numbers (Low/High/Best): 35 / 50 / 45
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 1294, 1308, 1316
Photographer: Ryan Frame numbers: 1290 - 1321 Spacer: 1322
Calculated distance from Trackline: 0.56 km

Final Time and Position of Sighting

Time: 15:51 WP#: 87 Lat: 35.619221 Long: -74.650446
Calculated Distance Traveled: 0.34 km

Behavior and Additional Comments

2 groups traveling subsurface

Wednesday, July 20, 2016 Sighting # 14

Initial sighting on Track

Time: 15:52 WP#: 89 Lat: 35.623996 Long: -74.675836
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 15:54 WP#: 90 Lat: 35.620159 Long: -74.678029
Species: *Tursiops truncatus* Numbers (Low/High/Best): 7 / 7 / 7
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 1326, 1327
Photographer: Ryan Frame numbers: 1323 - 1339 Spacer: 1340
Calculated distance from Trackline: 0.47 km

Final Time and Position of Sighting

Time: 15:54 WP#: 91 Lat: 35.624983 Long: -74.676470
Calculated Distance Traveled: 0.55 km

Behavior and Additional Comments

Lots of splashing, playful

Wednesday, July 20, 2016 Sighting # 15

Initial sighting on Track

Time: 15:57 WP#: 93 Lat: 35.620716 Long: -74.764640
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 15:58 WP#: 94 Lat: 35.626377 Long: -74.763815
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Golden brown, white in color, robust

Representative images used for Species ID: 1346, 1356, 1366, 1368
Photographer: Ryan Frame numbers: 1341 - 1385 Spacer: 1386
Calculated distance from Trackline: 0.63 km

Final Time and Position of Sighting

Time: 16:00 WP#: 95 Lat: 35.631147 Long: -74.763732
Calculated Distance Traveled: 0.53 km

Behavior and Additional Comments

Logging, slow travel

Wednesday, August 10, 2016 Sighting # 1

Initial sighting on Track

Time: 9:39 WP#: 9 Lat: 35.407624 Long: -74.644136
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 9:45 WP#: 10 Lat: 35.415232 Long: -74.651861
Species: *Tursiops truncatus* Numbers (Low/High/Best): 3 / 3 / 3
Features used in Species ID: Uniform gray coloration, robust body appearance.

Representative images used for Species ID: 2308, 2315, 2324, 2335
Photographer: Erin Frame numbers: 2306 - 2338 Spacer: 2339
Calculated distance from Trackline: 1.1 km

Final Time and Position of Sighting

Time: 9:45 WP#: 11 Lat: 35.41373 Long: -74.642282
Calculated Distance Traveled: 0.90 km

Behavior and Additional Comments

Single animal at first then two more appeared.

Wednesday, August 10, 2016 Sighting # 2

Initial sighting on Track

Time: 9:53 WP#: 15 Lat: 34.407178 Long: -74.846906
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 9:54 WP#: 16 Lat: 35.41074 Long: -74.856517
Species: *Tursiops truncatus* Numbers (Low/High/Best): 7 / 7 / 7
Features used in Species ID: Uniform gray coloration, robust body appearance, broad based dorsal fin.

Representative images used for Species ID: 2340, 2349, 2357
Photographer: Erin Frame numbers: 2340 - 2361 Spacer: 2362
Calculated distance from Trackline: 0.96 km

Final Time and Position of Sighting

Time: 9:59 WP#: 21 Lat: 35.406843 Long: -74.950724
Calculated Distance Traveled: 0.92 km

Behavior and Additional Comments

Two scattered groups, animals with white peduncles.

Wednesday, August 10, 2016 Sighting # 3

Initial sighting on Track

Time: 10:01 WP#: 19 Lat: 35.407538 Long: -74.948231
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:04 WP#: 20 Lat: 35.406584 Long: -74.944822
Species: *Tursiops truncatus* Numbers (Low/High/Best): 3 / 3 / 3
Features used in Species ID: Robust body appearance, uniform gray coloration

Representative images used for Species ID: 2368, 2376
Photographer: Erin Frame numbers: 2363 - 2385 Spacer: 2386
Calculated distance from Trackline: 0.33 km

Final Time and Position of Sighting

Time: 10:07 WP#: 21 Lat: 35.406843 Long: -74.950724
Calculated Distance Traveled: 0.54 km

Behavior and Additional Comments

Single group of animals then spread out, white peduncles.

Wednesday, August 10, 2016 Sighting # 4

Initial sighting on Track

Time: 10:26 WP#: 29 Lat: 35.474773 Long: -74.821592
Vertical Angle: 3 Horizontal Bearing in Degrees: 60 Sighting Cue: Splash
On/Off Effort: On Trackline: 36 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:27 WP#: 30 Lat: 35.451163 Long: -74.824753
Species: *Balaenoptera physalis* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Large fusiform body, white jaw, baleen whale

Representative images used for Species ID: 2433, 2440, 2442, 2456
Photographer: Erin Frame numbers: 2416 - 2466 Spacer: 2467
Calculated distance from Trackline: 2.64 km

Final Time and Position of Sighting

Time: 10:38 WP#: 32 Lat: 35.453509 Long: -74.838204
Calculated Distance Traveled: 1.24 km

Behavior and Additional Comments

Fluke prints visible at location of blow, animals made a series of three surfacings before diving again.

Wednesday, August 10, 2016 Sighting # 5

Initial sighting on Track

Time: 10:26 WP#: 29 Lat: 35.474773 Long: -74.821592
Vertical Angle: 3 Horizontal Bearing in Degrees: 60 Sighting Cue: Splash
On/Off Effort: Off Trackline: 36 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:36 WP#: 31 Lat: 35.449534 Long: -74.83593
Species: *Tursiops truncatus* Numbers (Low/High/Best): 10 / 12 / 12
Features used in Species ID: Uniform gray coloration, white peduncles present

Representative images used for Species ID: 2433, 2440, 2442, 2456
Photographer: Erin Frame numbers: 2416 - 2466 Spacer: 2467
Calculated distance from Trackline: 3.09 km

Final Time and Position of Sighting

Time: 10:38 WP#: 32 Lat: 35.453509 Long: -74.838204
Calculated Distance Traveled: NA

Behavior and Additional Comments

Scattered around the fin whale.

Wednesday, August 10, 2016 Sighting # 6

Initial sighting on Track

Time: 10:39 WP#: 34 Lat: 35.474313 Long: -74.812367
Vertical Angle: 3 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 2
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 10:42 WP#: 35 Lat: 35.478928 Long: -74.816545
Species: *Tursiops truncatus* Numbers (Low/High/Best): 12 / 12 / 12
Features used in Species ID: Uniform gray coloration, robust body appearance.

Representative images used for Species ID: 2469, 2473, 2474
Photographer: ERin Frame numbers: 2468 - 2481 Spacer: 2842
Calculated distance from Trackline: 3.09 km

Final Time and Position of Sighting

Time: 10:43 WP#: 36 Lat: 35.478565 Long: -74.821363
Calculated Distance Traveled: 0.48 km

Behavior and Additional Comments

Calf present within the group.

Wednesday, August 10, 2016 Sighting # 7

Initial sighting on Track

Time: 10:50 WP#: 38 Lat: 35.474934 Long: -74.595355
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 10:52 WP#: 39 Lat: 35.47564 Long: -74.597048
Species: *Mesoplodon europaeus* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Grey coloration with darker dorsal ridge, erupted teeth on lower jaw consistent with *M. europaeus*
Representative images used for Species ID: 2485, 2489, 2491
Photographer: Erin Frame numbers: 2483 - 2495 Spacer: 2496
Calculated distance from Trackline: 0.17 km

Final Time and Position of Sighting

Time: 10:56 WP#: 40 Lat: 35.474786 Long: -74.593471
Calculated Distance Traveled: 0.34 km

Behavior and Additional Comments

Wednesday, August 10, 2016 Sighting # 8

Initial sighting on Track

Time: 11:18 WP#: 44 Lat: 35.554308 Long: -74.699002
Vertical Angle: 2 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:24 WP#: 45 Lat: 35.562435 Long: -74.698614
Species: *Tursiops truncatus* Numbers (Low/High/Best): 28 / 28 / 28
Features used in Species ID: Uniform gray coloration, robust body appearance.
Representative images used for Species ID: 2505, 2507, 2512
Photographer: Erin Frame numbers: 2497 - 2526 Spacer: 2527
Calculated distance from Trackline: 0.9 km

Final Time and Position of Sighting

Time: 11:24 WP#: 46 Lat: 35.559674 Long: -74.700003
Calculated Distance Traveled: 0.33 km

Behavior and Additional Comments

Three groups with 3, 10, 15 individuals, calves present.

Wednesday, August 10, 2016 Sighting # 9

Initial sighting on Track

Time: 11:27 WP#: 48 Lat: 35.557562 Long: -74.766875
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:27 WP#: 49 Lat: 35.560476 Long: -74.764666
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Copper color behind dorsal fin, light grey forward of dorsal fin up to the head, dorsal fin placed well back on the body.
Representative images used for Species ID: 2538, 2540, 2561
Photographer: Erin Frame numbers: 2528 - 2564 Spacer: 2565
Calculated distance from Trackline: 0.39 km

Final Time and Position of Sighting

Time: 11:28 WP#: 50 Lat: 35.558761 Long: -74.768691
Calculated Distance Traveled: 0.41 km

Behavior and Additional Comments

Single animal.

Wednesday, August 10, 2016 Sighting # 10

Initial sighting on Track

Time: 11:32 WP#: 53 Lat: 35.554031 Long: -74.896241
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:35 WP#: 54 Lat: 35.559292 Long: -74.897721
Species: *Tursiops truncatus* Numbers (Low/High/Best): 12 / 12 / 12
Features used in Species ID: Uniform gray coloration, robust body.
Representative images used for Species ID: 2568, 2573, 2594
Photographer: Erin Frame numbers: 2566 - 2597 Spacer: 2598
Calculated distance from Trackline: 0.60 km

Final Time and Position of Sighting

Time: 11:36 WP#: 55 Lat: 35.562442 Long: -74.892814
Calculated Distance Traveled: 0.57 km

Behavior and Additional Comments

Infrequent surfacings made photographing the animals difficult.

Wednesday, August 10, 2016 Sighting # 11

Initial sighting on Track

Time: 14:06 WP#: 63 Lat: 35.62429 Long: -74.789299
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: Off Trackline: 38 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 14:09 WP#: 64 Lat: 35.621665 Long: -74.789742
Species: *Tursiops truncatus* Numbers (Low/High/Best): 11 / 12 / 12
Features used in Species ID: Robust body appearance, uniform grey coloration.

Representative images used for Species ID: 2612, 2625, 2632
Photographer: Erin Frame numbers: 2599 - 2635 Spacer: 2636
Calculated distance from Trackline: 0.29 km

Final Time and Position of Sighting

Time: 14:11 WP#: 66 Lat: 35.628646 Long: -74.781859
Calculated Distance Traveled: 1.05 km

Behavior and Additional Comments

Around fin whale in sighting 12

Wednesday, August 10, 2016 Sighting # 12

Initial sighting on Track

Time: 14:06 WP#: 63 Lat: 35.62429 Long: -74.789299
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 14:10 WP#: 65 Lat: 35.623118 Long: -74.790968
Species: *Balaenoptera physalis* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Large fusiform body, white lower jaw, chevron

Representative images used for Species ID: 26912, 2625, 2632
Photographer: Erin Frame numbers: 2599 - 2635 Spacer: 2636
Calculated distance from Trackline: 0.20 km

Final Time and Position of Sighting

Time: 14:11 WP#: 66 Lat: 35.628646 Long: -74.781859
Calculated Distance Traveled: 1.05 km

Behavior and Additional Comments

A few surfacings then dove for a longer period.

Wednesday, August 10, 2016 Sighting # 13

Initial sighting on Track

Time: 15:03 WP#: 74 Lat: 35.757474 Long: -74.821572
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:08 WP#: 75 Lat: 35.75116 Long: -74.82013
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 12 / 15 / 15
Features used in Species ID: Square head, black body, dorsal fin placed 1/3 back on the animals body
Representative images used for Species ID: 2653, 2657
Photographer: Erin Frame numbers: 2653 - 2680 Spacer: 2681
Calculated distance from Trackline: 0.71 km

Final Time and Position of Sighting

Time: 15:09 WP#: 76 Lat: 35.759275 Long: -74.810993
Calculated Distance Traveled: 1.22 km

Behavior and Additional Comments

Slow travel at the surface, small calf present.

Wednesday, August 10, 2016 Sighting # 14

Initial sighting on Track

Time: 15:14 WP#: 78 Lat: 35.757439 Long: -74.661772
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:18 WP#: 79 Lat: 35.758379 Long: -74.658529
Species: *Tursiops truncatus* Numbers (Low/High/Best): 15 / 18 / 16
Features used in Species ID: Uniform gray coloration, robust body
Representative images used for Species ID: 2696, 2701, 2708, 2717
Photographer: Erin Frame numbers: 2682 - 2721 Spacer: 2722
Calculated distance from Trackline: 0.31 km

Final Time and Position of Sighting

Time: 15:18 WP#: 80 Lat: 35.758511 Long: -74.654658
Calculated Distance Traveled: 0.35 km

Behavior and Additional Comments

One large and one small group, milling around some belly to belly swimming, breaching and splashing.

Wednesday, August 10, 2016 Sighting # 15

Initial sighting on Track

Time: 15:31 WP#: 83 Lat: 35.756905 Long: -74.387013
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 15:38 WP#: 84 Lat: 35.765282 Long: -74.378965
Species: *Tursiops truncatus* Numbers (Low/High/Best): 20 / 24 / 22
Features used in Species ID: Uniform grey coloration, robust body appearance.

Representative images used for Species ID: 2725, 2734
Photographer: Erin Frame numbers: 2723 - 2739 Spacer: 2740
Calculated distance from Trackline: 1.18 km

Final Time and Position of Sighting

Time: 15:42 WP#: 85 Lat: 35.761634 Long: -74.372327
Calculated Distance Traveled: 0.72 km

Behavior and Additional Comments

Wednesday, August 10, 2016 Sighting # 16

Initial sighting on Track

Time: 15:59 WP#: 90 Lat: 35.827526 Long: -74.797382
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 16:00 WP#: 91 Lat: 35.8247 Long: -74.79032
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: White head, grey body with scars along the body, small pectoral fins
dorsal fin place far back on the animal

Representative images used for Species ID: 2747, 2748, 2751
Photographer: Erin Frame numbers: 2741 - 2756 Spacer: 2757
Calculated distance from Trackline: 0.71 km

Final Time and Position of Sighting

Time: 16:02 WP#: 92 Lat: 35.83221 Long: -74.788459
Calculated Distance Traveled: 0.85 km

Behavior and Additional Comments

Thursday, August 11, 2016 Sighting # 1

Initial sighting on Track

Time: 8:51 WP#: 4 Lat: 35.903692 Long: -74.798911
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 42 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 8:53 WP#: 5 Lat: 35.906693 Long: -74.801032
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 6 / 6 / 6
Features used in Species ID: Dark body, blunt melon, short pectorals

Representative images used for Species ID: 2766, 2774, 2779
Photographer: Ryan Frame numbers: 2758 - 2784 Spacer: 2785
Calculated distance from Trackline: 0.38 km

Final Time and Position of Sighting

Time: 8:55 WP#: 6 Lat: 35.909055 Long: -74.800250
Calculated Distance Traveled: 0.27 km

Behavior and Additional Comments

Slow travel, 4 together and 2 separate

Thursday, August 11, 2016 Sighting # 2

Initial sighting on Track

Time: 8:57 WP#: 9 Lat: 35.903401 Long: -74.740932
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 42 Beaufort Sea State: 2
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 8:58 WP#: 10 Lat: 35.900608 Long: -74.742692
Species: *Tursiops truncatus* Numbers (Low/High/Best): 15 / 20 / 18
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 2793, 2802, 2805
Photographer: Ryan Frame numbers: 2786 - 2819 Spacer: 2820
Calculated distance from Trackline: 0.35 km

Final Time and Position of Sighting

Time: 9:01 WP#: 11 Lat: 35.898325 Long: -74.744803
Calculated Distance Traveled: 0.32 km

Behavior and Additional Comments

Traveling spaced out, calves present

Thursday, August 11, 2016 Sighting # 3

Initial sighting on Track

Time: 9:03 WP#: 14 Lat: 35.903640 Long: -74.666712
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Splash
On/Off Effort: On Trackline: 42 Beaufort Sea State: 2
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 9:03 WP#: 15 Lat: 35.894222 Long: -74.673056
Species: *Tursiops truncatus* Numbers (Low/High/Best): 6 / 6 / 6
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 2828, 2836
Photographer: Ryan Frame numbers: 2821 - 2838 Spacer: 2839
Calculated distance from Trackline: 1.19 km

Final Time and Position of Sighting

Time: 9:06 WP#: 16 Lat: 35.896662 Long: -74.674252
Calculated Distance Traveled: 0.29 km

Behavior and Additional Comments

Slow travel

Thursday, August 11, 2016 Sighting # 4

Initial sighting on Track

Time: 10:14 WP#: 37 Lat: 36.121340 Long: -74.477054
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 45 Beaufort Sea State: 1
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 10:16 WP#: 38 Lat: 36.120853 Long: -74.476147
Species: *Tursiops truncatus* Numbers (Low/High/Best): 20 / 30 / 28
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 2843, 2845, 2857, 286
Photographer: Ryan Frame numbers: 2840 - 2867 Spacer: 2868
Calculated distance from Trackline: 0.10 km

Final Time and Position of Sighting

Time: 10:18 WP#: 39 Lat: 36.120967 Long: -74.477016
Calculated Distance Traveled: 0.08 km

Behavior and Additional Comments

Slow to no travel, milling, calf present

Thursday, August 11, 2016 Sighting # 5

Initial sighting on Track

Time: 10:20 WP#: 41 Lat: 36.122068 Long: -74.527155
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 45 Beaufort Sea State: 1
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 10:20 WP#: 42 Lat: 36.128048 Long: -74.529440
Species: *Tursiops truncatus* Numbers (Low/High/Best): 48 / 65 / 60
Features used in Species ID: Uniform gray

Representative images used for Species ID: 2877, 2881
Photographer: Ryan Frame numbers: 2869 - 2901 Spacer: 2902
Calculated distance from Trackline: 0.70 km

Final Time and Position of Sighting

Time: 10:23 WP#: 43 Lat: 36.127719 Long: -74.522938
Calculated Distance Traveled: 0.59 km

Behavior and Additional Comments

Slow travel, calves, multiple groups

Thursday, August 11, 2016 Sighting # 6

Initial sighting on Track

Time: 10:29 WP#: 44 Lat: 36.121592 Long: -74.718950
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 45 Beaufort Sea State: 2
Observer: Ryan Observer side: Right

Actual Time and Position of Sighting

Time: 10:30 WP#: 45 Lat: 36.124604 Long: -74.716597
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 17 / 17 / 17
Features used in Species ID: Dark body, blunt head, short pectorals

Representative images used for Species ID: 2910, 2912, 2915
Photographer: Ryan Frame numbers: 2903 - 2916 Spacer: 2917
Calculated distance from Trackline: 0.40 km

Final Time and Position of Sighting

Time: 10:31 WP#: 46 Lat: 36.128852 Long: -74.719400
Calculated Distance Traveled: 0.54 km

Behavior and Additional Comments

Milling just below the surface

Thursday, August 11, 2016 Sighting # 7

Initial sighting on Track

Time: 10:32 WP#: 48 Lat: 36.121787 Long: -74.759570
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 45 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 10:34 WP#: 49 Lat: 36.117109 Long: -74.754044
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 40 / 60 / 50
Features used in Species ID: Dark body, blunt melon, short pectorals

Representative images used for Species ID: 2918, 2923, 2926
Photographer: Ryan Frame numbers: 2918 - 2928 Spacer: 2929
Calculated distance from Trackline: 0.72 km

Final Time and Position of Sighting

Time: 10:35 WP#: 50 Lat: 36.123110 Long: -74.756738
Calculated Distance Traveled: 0.71 km

Behavior and Additional Comments

Milling, multiple groups

Sunday, September 11, 2016 Sighting # 1

Initial sighting on Track

Time: 10:23 WP#: 14 Lat: 35.481404 Long: -74.693961
Vertical Angle: 1 Horizontal Bearing in Degrees: 120 Sighting Cue: Blow
On/Off Effort: On Trackline: 36 Beaufort Sea State: 3
Observer: Left Observer side: Tiffany

Actual Time and Position of Sighting

Time: 10:24 WP#: 15 Lat: 35.484442 Long: -74.697859
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Long body, short pectorals, dorsal fin set back on body, copper/white color

Representative images used for Species ID: N/A
Photographer: Erin Frame numbers: N/A Spacer: N/A
Calculated distance from Trackline: 0.49 km

Final Time and Position of Sighting

Time: 10:30 WP#: 16 Lat: 35.480153 Long: -74.674741
Calculated Distance Traveled: 2.15 km

Behavior and Additional Comments

No photos, dove when we flew over, final location not accurate

Sunday, September 11, 2016 Sighting # 2

Initial sighting on Track

Time: 13:43 WP#: 29 Lat: 35.690628 Long: -74.594760
Vertical Angle: 1 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 13:44 WP#: 30 Lat: 35.694374 Long: -74.588224
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Copper and white coloration, dorsal fin set back on body

Representative images used for Species ID: 3705
Photographer: Erin Frame numbers: 3702 - 3705 Spacer: 3706
Calculated distance from Trackline: 0.72 km

Final Time and Position of Sighting

Time: 13:47 WP#: 31 Lat: 35.699167 Long: -74.585495
Calculated Distance Traveled: 0.59 km

Behavior and Additional Comments

Slow travel at the surface, dove when we flew over

Sunday, September 11, 2016 Sighting # 3

Initial sighting on Track

Time: 14:28 WP#: 39 Lat: 35.833042 Long: -74.345877
Vertical Angle: 1 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:29 WP#: 40 Lat: 35.837068 Long: -74.348722
Species: *Tursiops truncatus* Numbers (Low/High/Best): 40 / 50 / 45
Features used in Species ID: Robust, uniform gray, white peduncles

Representative images used for Species ID: 3709, 3711, 3723
Photographer: Erin Frame numbers: 3707 - 3730 Spacer: 3731
Calculated distance from Trackline: 0.52 km

Final Time and Position of Sighting

Time: 14:45 WP#: 41 Lat: 35.838691 Long: -74.361079
Calculated Distance Traveled: 1.12 km

Behavior and Additional Comments

Fast travel subsurface, regular surfacing

Sunday, September 11, 2016 Sighting # 4

Initial sighting on Track

Time: 14:49 WP#: 45 Lat: 35.833659 Long: -74.479519
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:51 WP#: 46 Lat: 35.837273 Long: -74.475531
Species: *Tursiops truncatus* Numbers (Low/High/Best): 13 / 15 / 14
Features used in Species ID: Robust, uniform gray, white peduncles

Representative images used for Species ID: 3732, 3736
Photographer: Erin Frame numbers: 3732 - 3741 Spacer: 3742
Calculated distance from Trackline: 0.54 km

Final Time and Position of Sighting

Time: 14:54 WP#: 47 Lat: 35.846782 Long: -74.470211
Calculated Distance Traveled: 1.16 km

Behavior and Additional Comments

Fast travel

Monday, September 12, 2016 Sighting # 1

Initial sighting on Track

Time: 9:02 WP#: 3 Lat: 35.906923 Long: -75.139684
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 42 Beaufort Sea State: 3
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 9:04 WP#: 4 Lat: 35.906950 Long: -75.140172
Species: *Stenella frontalis* Numbers (Low/High/Best): 25 / 40 / 35
Features used in Species ID: Alternating light and dark pattern down body, spotting

Representative images used for Species ID: 3751, 3861, 3864
Photographer: Tiffany Frame numbers: 3743 - 3879 Spacer: 3880
Calculated distance from Trackline: 0.04 km

Final Time and Position of Sighting

Time: 9:08 WP#: 5 Lat: 35.904442 Long: -75.143894
Calculated Distance Traveled: 0.44 km

Behavior and Additional Comments

Milling, slow travel, rolling

Monday, September 12, 2016 Sighting # 2

Initial sighting on Track

Time: 9:47 WP#: 17 Lat: 35.978185 Long: -74.600309
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Splash
On/Off Effort: On Trackline: 43 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 9:48 WP#: 18 Lat: 35.972860 Long: -74.597093
Species: *Tursiops truncatus* Numbers (Low/High/Best): 15 / 20 / 25
Features used in Species ID: Robust, uniform gray, white peduncles

Representative images used for Species ID: 3886, 3894, 3905, 3919, 3988
Photographer: Tiffany Frame numbers: 3881 - 3949 Spacer: 3950
Calculated distance from Trackline: 0.66 km

Final Time and Position of Sighting

Time: 9:54 WP#: 19 Lat: 35.972698 Long: -74.601302
Calculated Distance Traveled: 0.38 km

Behavior and Additional Comments

Multiple groups, circling, playing, white peduncles

Monday, September 12, 2016 Sighting # 3

Initial sighting on Track

Time: 10:26 WP#: 28 Lat: 36.050000 Long: -74.635338
Vertical Angle: 3 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 44 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 10:29 WP#: 29 Lat: 36.055836 Long: -74.637831
Species: *Tursiops truncatus* Numbers (Low/High/Best): 5 / 5 / 5
Features used in Species ID: Uniform gray, robust, white peduncles

Representative images used for Species ID: 3988
Photographer: Tiffany Frame numbers: 3951 - 4008 Spacer: 4009
Calculated distance from Trackline: 0.69 km

Final Time and Position of Sighting

Time: 10:32 WP#: 30 Lat: 36.062024 Long: -74.637587
Calculated Distance Traveled: 0.69 km

Behavior and Additional Comments

Traveling subsurface north, white peduncles

Monday, September 12, 2016 Sighting # 4

Initial sighting on Track

Time: 10:37 WP#: 32 Lat: 36.049529 Long: -74.458341
Vertical Angle: 3 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 44 Beaufort Sea State: 2
Observer: Erin Observer side: Left

Actual Time and Position of Sighting

Time: 10:38 WP#: 33 Lat: 36.059184 Long: -74.461430
Species: *Tursiops truncatus* Numbers (Low/High/Best): 30 / 42 / 40
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 4029, 4050, 4055, 4061, 4071
Photographer: Tiffany Frame numbers: 4010 - 4082 Spacer: 4083
Calculated distance from Trackline: 1.11 km

Final Time and Position of Sighting

Time: 10:42 WP#: 34 Lat: 36.058865 Long: -74.467068
Calculated Distance Traveled: 0.51 km

Behavior and Additional Comments

Scattered everywhere, diving, subsurface travel, large remora on one animal

Monday, September 12, 2016 Sighting # 5

Initial sighting on Track

Time: 10:55 WP#: 39 Lat: 36.122234 Long: -74.579961
Vertical Angle: 4 Horizontal Bearing in Degrees: 100 Sighting Cue: Breach
On/Off Effort: On Trackline: 45 Beaufort Sea State: 3
Observer: Tiffany Observer side: Right

Actual Time and Position of Sighting

Time: 11:01 WP#: 40 Lat: 36.141453 Long: -74.588563
Species: *Stenella frontalis* Numbers (Low/High/Best): 90 / 120 / 100
Features used in Species ID: Alternating light and dark pattern down body, spotting

Representative images used for Species ID: 4095, 4105, 4124, 4129, 4174
Photographer: Tiffany Frame numbers: 4084 - 4189 Spacer: 4190
Calculated distance from Trackline: 2.27 km

Final Time and Position of Sighting

Time: 11:08 WP#: 41 Lat: 36.143285 Long: -74.598784
Calculated Distance Traveled: 0.94 km

Behavior and Additional Comments

Traveling subsurface, multiple groups

Monday, September 12, 2016 Sighting # 6

Initial sighting on Track

Time: 11:10 WP#: 43 Lat: 36.122033 Long: -74.639911
Vertical Angle: 3 Horizontal Bearing in Degrees: 120 Sighting Cue: Body
On/Off Effort: On Trackline: 45 Beaufort Sea State: 3
Observer: Tiffany Observer side: Right

Actual Time and Position of Sighting

Time: 11:11 WP#: 44 Lat: 36.125405 Long: -74.631275
Species: *Stenella frontalis* Numbers (Low/High/Best): 10 / 20 / 15
Features used in Species ID: Alternating light and dark pattern down body, spotting

Representative images used for Species ID: 4192, 4218, 4220, 4224
Photographer: Tiffany Frame numbers: 4191 - 4227 Spacer: 4228
Calculated distance from Trackline: 0.86 km

Final Time and Position of Sighting

Time: 11:14 WP#: 45 Lat: 36.127182 Long: -74.629877
Calculated Distance Traveled: 0.23 km

Behavior and Additional Comments

Traveling subsurface

Thursday, October 27, 2016 Sighting # 1

Initial sighting on Track

Time: 9:17 WP#: 4 Lat: 35.620470 Long: -74.771974
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 9:18 WP#: 5 Lat: 35.618396 Long: -74.771810
Species: *Tursiops truncatus* Numbers (Low/High/Best): 12 / 12 / 12
Features used in Species ID: Uniform gray, robust

Representative images used for Species ID: 5183, 5199
Photographer: Erin Frame numbers: 5180 - 5246 Spacer: 5247
Calculated distance from Trackline: 0.23 km

Final Time and Position of Sighting

Time: 9:25 WP#: 6 Lat: 35.614319 Long: -74.776555
Calculated Distance Traveled: 0.62 km

Behavior and Additional Comments

Two groups of animals traveling subsurface with infrequent quick surfacings. Difficult to photograph.
Camera not focusing

Thursday, October 27, 2016 Sighting # 2

Initial sighting on Track

Time: 9:26 WP#: 7 Lat: 35.617001 Long: -74.769192
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: Off Trackline: 38 Beaufort Sea State: 2
Observer: Right Observer side: Left

Actual Time and Position of Sighting

Time: 9:27 WP#: 8 Lat: 35.617137 Long: -74.765367
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 10 / 10 / 10
Features used in Species ID:

Representative images used for Species ID: 5248
Photographer: Erin Frame numbers: 5248 - 5249 Spacer: 5250
Calculated distance from Trackline: 0.35 km

Final Time and Position of Sighting

Time: NA WP#: NA Lat: NA Long: NA
Calculated Distance Traveled: NA

Behavior and Additional Comments

Animals hanging at the surface, spotted y pilot while circling Sighting 1
Camera not focusing

Thursday, October 27, 2016 Sighting # 3

Initial sighting on Track

Time: 9:33 WP#: 10 Lat: 35.620603 Long: -74.554012
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 9:34 WP#: 11 Lat: 35.625555 Long: -74.553026
Species: *Ziphius cavirostris* Numbers (Low/High/Best): 2 / 2 / 2
Features used in Species ID: Long grey, brown body with light scarring, small pectoral fins, broad flukes. Dorsal fin placed well back along animals body.
Representative images used for Species ID: 5257, 5258, 5262
Photographer: Erin Frame numbers: 5251 - 5262 Spacer: 5263
Calculated distance from Trackline: 0.56 km

Final Time and Position of Sighting

Time: 9:36 WP#: 12 Lat: 35.619952 Long: -74.558951
Calculated Distance Traveled: 0.82 km

Behavior and Additional Comments

Animals at the surface for only a brief period of time.

Thursday, October 27, 2016 Sighting # 4

Initial sighting on Track

Time: 9:51 WP#: 16 Lat: 35.687268 Long: -74.544071
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 39 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 9:57 WP#: 17 Lat: 35.699089 Long: -74.548408
Species: *Tursiops truncatus* Numbers (Low/High/Best): 10 / 12 / 12
Features used in Species ID: Uniform gray coloration, robust body appearance.
Representative images used for Species ID: 5272
Photographer: Erin Frame numbers: 5264 - 5276 Spacer: 5277
Calculated distance from Trackline: 1.37 km

Final Time and Position of Sighting

Time: 9:57 WP#: 18 Lat: 35.698116 Long: -74.542486
Calculated Distance Traveled: 0.55 km

Behavior and Additional Comments

Group traveling subsurface followed by quick surfacings, white peduncles on some of animals.

Thursday, October 27, 2016 Sighting # 5

Initial sighting on Track

Time: 9:59 WP#: 39 Lat: 35.687293 Long: -74.602307
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 39 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:05 WP#: 21 Lat: 35.691125 Long: -74.599049
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 4 / 4 / 4
Features used in Species ID: Long black bodies, square head, dorsal fin place 1/3 back the animals body.

Representative images used for Species ID: 5285, 5288, 5290
Photographer: Erin Frame numbers: 5278 - 5297 Spacer: 5298
Calculated distance from Trackline: 0.52 km

Final Time and Position of Sighting

Time: 10:08 WP#: 22 Lat: 35.686633 Long: -74.595799
Calculated Distance Traveled: 0.58 km

Behavior and Additional Comments

Animals traveling very fast vs other groups of pilot whales we have seen. Quick surfacings followed by travel well below the surface.

Thursday, October 27, 2016 Sighting # 6

Initial sighting on Track

Time: 10:31 WP#: 28 Lat: 35.759067 Long: -74.932321
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 10:34 WP#: 29 Lat: 35.757280 Long: -74.941602
Species: *Tursiops truncatus* Numbers (Low/High/Best): 15 / 16 / 16
Features used in Species ID: Robust body appearance, gray coloration

Representative images used for Species ID: 5305, 5307, 5328
Photographer: Erin Frame numbers: 5299 - 5332 Spacer: 5333
Calculated distance from Trackline: 0.86 km

Final Time and Position of Sighting

Time: 10:37 WP#: 30 Lat: 35.764065 Long: -74.937807
Calculated Distance Traveled: 0.83 km

Behavior and Additional Comments

A line of animals traveling slowly at the surface. Younger animals present in the group.

Thursday, October 27, 2016 Sighting # 7

Initial sighting on Track

Time: 10:40 WP#: 32 Lat: 35.759359 Long: -74.825337
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Spalsh
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:41 WP#: 33 Lat: 35.754603 Long: -74.830978
Species: *Tursiops truncatus* Numbers (Low/High/Best): 40 / 45 / 45
Features used in Species ID: Robust body appearance, gray coloration with some white on peduncle.
Representative images used for Species ID: 5348, 5350, 5354, 5357, 5365
Photographer: Erin Frame numbers: 5334 - 5370 Spacer: 5371
Calculated distance from Trackline: 0.73 km

Final Time and Position of Sighting

Time: 10:42 WP#: 34 Lat: 35.760302 Long: -74.820865
Calculated Distance Traveled: 1.11 km

Behavior and Additional Comments

Multiple groups of 8-10 at the surface.

Thursday, October 27, 2016 Sighting # 8

Initial sighting on Track

Time: 10:44 WP#: 36 Lat: 35.759076 Long: -74.762352
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Splash
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 10:46 WP#: 37 Lat: 35.761629 Long: -74.770999
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 15 / 18 / 16
Features used in Species ID: Large black body, square head, broad dorsal fin place 1/3 back on the body.
Representative images used for Species ID: 5377, 5384
Photographer: Erin Frame numbers: 5372 - 5390 Spacer: 5391
Calculated distance from Trackline: 0.83 km

Final Time and Position of Sighting

Time: 10:46 WP#: 38 Lat: 35.764319 Long: -74.769875
Calculated Distance Traveled: 0.32 km

Behavior and Additional Comments

A few groups traveling close together at the surface.

Thursday, October 27, 2016 Sighting # 9

Initial sighting on Track

Time: 10:50 WP#: 40 Lat: 35.759159 Long: -74.610725
Vertical Angle: 3 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 10:54 WP#: 41 Lat: 35.768228 Long: -74.607360
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 10 / 12 / 11
Features used in Species ID: Large black body, square head, broad dorsal fin place 1/3 back on the body
Representative images used for Species ID: 5399, 5411
Photographer: Erin Frame numbers: 5392 - 5413 Spacer: 5414
Calculated distance from Trackline: 1.05 km

Final Time and Position of Sighting

Time: 10:54 WP#: 42 Lat: 35.764556 Long: -74.612221
Calculated Distance Traveled: 0.60 km

Behavior and Additional Comments

One main group and a few other scattered individuals nearby.

Thursday, October 20, 2016 Sighting # 10

Initial sighting on Track

Time: 10:58 WP#: 44 Lat: 35.759030 Long: -74.488817
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Splash
On/Off Effort: On Trackline: 40 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:59 WP#: 45 Lat: 35.757904 Long: -74.489487
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 8 / 8 / 8
Features used in Species ID: Large black body, square head, broad dorsal fin place 1/3 back on the body
Representative images used for Species ID: 5441, 5446
Photographer: Erin Frame numbers: 5415 - 5448 Spacer: 5449
Calculated distance from Trackline: 0.14 km

Final Time and Position of Sighting

Time: 11:00 WP#: 46 Lat: 35.758062 Long: -74.495197
Calculated Distance Traveled: 0.52 km

Behavior and Additional Comments

One large group logging at the surface.

Thursday, October 27, 2016 Sighting # 11

Initial sighting on Track

Time: 11:18 WP#: 50 Lat: 35.825670 Long: -74.812166
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:19 WP#: 51 Lat: 35.827873 Long: -74.812117
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 12 / 12 / 12
Features used in Species ID: Large black body, square head, broad dorsal fin place 1/3 back on the body
Representative images used for Species ID: 5462, 5465, 5473, 5476
Photographer: Erin Frame numbers: 5450 - 5478 Spacer: 5479
Calculated distance from Trackline: 0.25 km

Final Time and Position of Sighting

Time: 11:21 WP#: 52 Lat: 35.834875 Long: -74.813538
Calculated Distance Traveled: 0.79 km

Behavior and Additional Comments

Slow travel at the surface, 3-4 body lengths apart. A second group of 8 sighted nearby the first group.

Thursday, October 27, 2016 Sighting # 12

Initial sighting on Track

Time: 13:40 WP#: 59 Lat: 35.905372 Long: -74.525978
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 42 Beaufort Sea State: 4
Observer: Ryan Observer side: Left

Actual Time and Position of Sighting

Time: 13:41 WP#: 60 Lat: 35.910275 Long: -74.524409
Species: *Tursiops truncatus* Numbers (Low/High/Best): 20 / 24 / 24
Features used in Species ID: Robust body appearance, gray body coloration.
Representative images used for Species ID: 5483, 5489, 5493, 5497
Photographer: Erin Frame numbers: 5480 - 5502 Spacer: 5503
Calculated distance from Trackline: 0.56 km

Final Time and Position of Sighting

Time: 13:45 WP#: 61 Lat: 35.907978 Long: -74.530145
Calculated Distance Traveled: 0.58 km

Behavior and Additional Comments

Slow travel in a close line at the surface.

Thursday, October 27, 2016 Sighting # 13

Initial sighting on Track

Time: 14:02 WP#: 67 Lat: 35.988824 Long: -74.703305
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: Off Trackline: 43 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:06 WP#: 68 Lat: 35.989960 Long: -74.698950
Species: *Grampus griseus* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Extensive scarring on animals body, no pointed rostrum melon with crease ending in a rounded head
Representative images used for Species ID: NA
Photographer: Erin Frame numbers: Right Spacer: NA
Calculated distance from Trackline: 0.41 km

Final Time and Position of Sighting

Time: NA WP#: NA Lat: NA Long: NA
Calculated Distance Traveled: NA

Behavior and Additional Comments

Single animal

Thursday, October 27, 2016 Sighting # 14

Initial sighting on Track

Time: 14:54 WP#: 77 Lat: 36.119702 Long: -74.074961
Vertical Angle: 1 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 45 Beaufort Sea State: 4
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 14:57 WP#: 78 Lat: 36.127098 Long: -75.074706
Species: *Tursiops truncatus* Numbers (Low/High/Best): 12 / 15 / 15
Features used in Species ID: Robust gray bodies with white coloration on the peduncle.
Representative images used for Species ID: 5517, 5529, 5538
Photographer: Erin Frame numbers: 5504 - 5546 Spacer: 5547
Calculated distance from Trackline: 0.82 km

Final Time and Position of Sighting

Time: 15:04 WP#: 79 Lat: 36.146552 Long: -75.071752
Calculated Distance Traveled: 2.18 km

Behavior and Additional Comments

Tight group, fast travel below the surface.

Wednesday, November 2, 2016 Sighting # 1

Initial sighting on Track

Time: 10:01 WP#: 11 Lat: 35.405682 Long: -74.870774
Vertical Angle: 2 Horizontal Bearing in Degrees: 100 Sighting Cue: Body
On/Off Effort: On Trackline: 35 Beaufort Sea State: 3
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:02 WP#: 12 Lat: 35.407536 Long: -74.869685
Species: *Tursiops truncatus* Numbers (Low/High/Best): 1 / 1 / 1
Features used in Species ID: Gray robust body with white peduncle

Representative images used for Species ID: 009, 024
Photographer: Erin Frame numbers: 005 - 030 Spacer: 030
Calculated distance from Trackline: 0.23 km

Final Time and Position of Sighting

Time: 10:08 WP#: 13 Lat: 35.408536 Long: -74.866328
Calculated Distance Traveled: 0.15 km

Behavior and Additional Comments

Subsurface travel; evasive

Wednesday, November 2, 2016 Sighting # 2

Initial sighting on Track

Time: 10:21 WP#: 17 Lat: 35.475691 Long: -75.057344
Vertical Angle: 2 Horizontal Bearing in Degrees: 120 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 10:22 WP#: 17 Lat: 35.471915 Long: -75.058017
Species: *Stenella frontalis* Numbers (Low/High/Best): 12 / 19 / 16
Features used in Species ID: Spotted appearance and prominent blaze pigmentation

Representative images used for Species ID: 5554, 5558, 5559
Photographer: Erin Frame numbers: 5548 - 5569 Spacer: 5569
Calculated distance from Trackline: 0.42 km

Final Time and Position of Sighting

Time: 10:30 WP#: 19 Lat: 35.468646 Long: -75.065789
Calculated Distance Traveled: 0.79 km

Behavior and Additional Comments

Small group traveling fast.

Wednesday, November 2, 2016 Sighting # 3

Initial sighting on Track

Time: 10:37 WP#: 23 Lat: 35.476227 Long: -74.880664
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 36 Beaufort Sea State: 2
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 10:41 WP#: 24 Lat: 35.475115 Long: -74.884554
Species: *Tursiops truncatus* Numbers (Low/High/Best): 16 / 16 / 16
Features used in Species ID: Gray robust body with white peduncle

Representative images used for Species ID: 5570, 5571, 5578
Photographer: Erin Frame numbers: 5570 - 5587 Spacer: 5587
Calculated distance from Trackline: 0.37 km

Final Time and Position of Sighting

Time: 10:41 WP#: 31 Lat: 35.475262 Long: -74.886186
Calculated Distance Traveled: 0.15 km

Behavior and Additional Comments

Two tight groups

Wednesday, November 2, 2016 Sighting # 4

Initial sighting on Track

Time: 11:02 WP#: 31 Lat: 35.552520 Long: -74.460845
Vertical Angle: 2 Horizontal Bearing in Degrees: 90 Sighting Cue: Blow
On/Off Effort: On Trackline: 37 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:03 WP#: 32 Lat: 35.558448 Long: -74.455914
Species: *Stenella clymene* Numbers (Low/High/Best): 250 / 350 / 300
Features used in Species ID: Slender sleek body and black moustache

Representative images used for Species ID: 5599, 5612, 5614, 5638, 5646
Photographer: Erin Frame numbers: 5588 - 5649 Spacer: 5649
Calculated distance from Trackline: 0.80 km

Final Time and Position of Sighting

Time: 11:14 WP#: 33 Lat: 35.558783 Long: -74.465601
Calculated Distance Traveled: 0.90 km

Behavior and Additional Comments

Large super group with animals scattered everywhere; very fast travel

Wednesday, November 2, 2016 Sighting # 5

Initial sighting on Track

Time: 11:20 WP#: 35 Lat: 35.553359 Long: -74.708695
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Blow
On/Off Effort: On Trackline: 37 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:21 WP#: 36 Lat: 35.556899 Long: -74.712916
Species: *Tursiops truncatus* Numbers (Low/High/Best): 40 / 50 / 45
Features used in Species ID: Gray robust body with white peduncle

Representative images used for Species ID: 5651, 5653, 5655, 5666
Photographer: Erin Frame numbers: 5650 - 5669 Spacer: 5669
Calculated distance from Trackline: 0.55 km

Final Time and Position of Sighting

Time: 11:22 WP#: 37 Lat: 35.557134 Long: -74.720426
Calculated Distance Traveled: 0.70 km

Behavior and Additional Comments

Splashing a lot

Wednesday, November 2, 2016 Sighting # 6

Initial sighting on Track

Time: 11:25 WP#: 39 Lat: 35.553488 Long: -74.813462
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:26 WP#: 40 Lat: 35.554665 Long: -74.808430
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 8 / 12 / 10
Features used in Species ID: Blunt head and black coloration

Representative images used for Species ID: 5683, 5691, 5693
Photographer: Erin Frame numbers: 5670 - 5699 Spacer: 5699
Calculated distance from Trackline: 0.47 km

Final Time and Position of Sighting

Time: 11:27 WP#: 41 Lat: 35.552067 Long: -74.808349
Calculated Distance Traveled: 0.28 km

Behavior and Additional Comments

slow travel with regular surfacings

Wednesday, November 2, 2016 Sighting # 7

Initial sighting on Track

Time: 11:30 WP#: 43 Lat: 35.553111 Long: -74.916955
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:31 WP#: 44 Lat: 35.552492 Long: -74.915997
Species: *Tursiops truncatus* Numbers (Low/High/Best): 20 / 30 / 25
Features used in Species ID: Gray robust body with white peduncle

Representative images used for Species ID: 5700, 5707, 5717
Photographer: Erin Frame numbers: 5700 - 5719 Spacer: 5719
Calculated distance from Trackline: 0.11 km

Final Time and Position of Sighting

Time: 11:32 WP#: 45 Lat: 35.554273 Long: -74.925067
Calculated Distance Traveled: 0.84 km

Behavior and Additional Comments

Fast travel

Wednesday, November 2, 2016 Sighting # 8

Initial sighting on Track

Time: 11:37 WP#: 50 Lat: 35.553268 Long: -75.093990
Vertical Angle: 2 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 37 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 11:38 WP#: 51 Lat: 35.561177 Long: -75.094562
Species: *Stenella frontalis* Numbers (Low/High/Best): 30 / 40 / 35
Features used in Species ID: Spotted coloration and prominent blaze pattern

Representative images used for Species ID: 5723, 5738, 5749
Photographer: Erin Frame numbers: 5720 - 5764 Spacer: 5764
Calculated distance from Trackline: 0.88 km

Final Time and Position of Sighting

Time: 10:41 WP#: 52 Lat: 35.568424 Long: -75.100870
Calculated Distance Traveled: 0.99 km

Behavior and Additional Comments

slow travel with regular surfacings

Wednesday, November 2, 2016 Sighting # 9

Initial sighting on Track

Time: 13:41 WP#: 61 Lat: 35.620462 Long: -75.048420
Vertical Angle: 1 Horizontal Bearing in Degrees: 120 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 2
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 13:53 WP#: 62 Lat: 35.627384 Long: -75.048084
Species: *Unidentified Delphinid* Numbers (Low/High/Best): 10 / 12 / 11
Features used in Species ID: NA

Representative images used for Species ID: NA
Photographer: Erin Frame numbers: NA Spacer: NA
Calculated distance from Trackline: NA

Final Time and Position of Sighting

Time: 13:53 WP#: 62 Lat: 35.627384 Long: -75.048084
Calculated Distance Traveled: 0.77 km

Behavior and Additional Comments

Fast high breaching; unable to relocate

Wednesday, November 2, 2016 Sighting # 10

Initial sighting on Track

Time: 14:03 WP#: 69 Lat: 35.621009 Long: -74.797697
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 1
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 14:03 WP#: 70 Lat: 35.616718 Long: -74.791111
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 12 / 16 / 14
Features used in Species ID: Blunt head and black body

Representative images used for Species ID: 5767, 5775, 5778, 5781, 5784, 5793
Photographer: Erin Frame numbers: 5765 - 5799 Spacer: 5799
Calculated distance from Trackline: 0.76 km

Final Time and Position of Sighting

Time: 14:06 WP#: 71 Lat: 35.621248 Long: -74.784149
Calculated Distance Traveled: 0.81 km

Behavior and Additional Comments

Slow travel; at least three calves in group

Wednesday, November 2, 2016 Sighting # 11

Initial sighting on Track

Time: 14:07 WP#: 73 Lat: 35.620055 Long: -74.729293
Vertical Angle: 1 Horizontal Bearing in Degrees: 70 Sighting Cue: Body
On/Off Effort: On Trackline: 38 Beaufort Sea State: 1
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 14:09 WP#: 74 Lat: 35.619404 Long: -74.736401
Species: *Tursiops truncatus* Numbers (Low/High/Best): 4 / 4 / 4
Features used in Species ID: Uniform gray coloration and robust body

Representative images used for Species ID: 5804, 5812, 5814
Photographer: Erin Frame numbers: 5800 - 5814 Spacer: 5818
Calculated distance from Trackline: 0.65 km

Final Time and Position of Sighting

Time: 14:11 WP#: 75 Lat: 35.625113 Long: -74.732143
Calculated Distance Traveled: 0.74 km

Behavior and Additional Comments

Two groups; slow travel

Wednesday, November 2, 2016 Sighting # 12

Initial sighting on Track

Time: 14:36 WP#: 80 Lat: 35.689778 Long: -74.784488
Vertical Angle: 3 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 39 Beaufort Sea State: 1
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 14:37 WP#: 81 Lat: 35.688038 Long: -74.771337
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 12 / 18 / 16
Features used in Species ID: Blunt head and black body

Representative images used for Species ID: 048, 055
Photographer: Erin Frame numbers: 042 - 059 Spacer: 059
Calculated distance from Trackline: 1.20 km

Final Time and Position of Sighting

Time: 14:37 WP#: 82 Lat: 35.686492 Long: -74.769092
Calculated Distance Traveled: 0.27 km

Behavior and Additional Comments

Swimming slowly in a line of sargassum grass.

Wednesday, November 2, 2016 Sighting # 13

Initial sighting on Track

Time: 15:11 WP#: 99 Lat: 35.758482 Long: -74.845381
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 1
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:11 WP#: 100 Lat: 35.745295 Long: -74.850638
Species: *Tursiops truncatus* Numbers (Low/High/Best): 16 / 18 / 17
Features used in Species ID: Uniform gray coloration and robust body

Representative images used for Species ID: 5978, 5910
Photographer: Erin Frame numbers: 5874 - 5921 Spacer: 5921
Calculated distance from Trackline: 1.54 km

Final Time and Position of Sighting

Time: 15:16 WP#: 101 Lat: 35.758458 Long: -74.845800
Calculated Distance Traveled: 1.52 km

Behavior and Additional Comments

Fast travel

Wednesday, November 2, 2016 Sighting # 14

Initial sighting on Track

Time: 15:19 WP#: 103 Lat: 35.758602 Long: -74.753314
Vertical Angle: 2 Horizontal Bearing in Degrees: 60 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 1
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 15:20 WP#: 104 Lat: 35.749853 Long: -74.753684
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 14 / 16 / 18
Features used in Species ID: Blunt head and black body

Representative images used for Species ID: 5923, 5937, 5935
Photographer: Erin Frame numbers: 5922 - 5956 Spacer: 5956
Calculated distance from Trackline: 0.97 km

Final Time and Position of Sighting

Time: 15:21 WP#: 105 Lat: 35.752346 Long: -74.750015
Calculated Distance Traveled: 0.43 km

Behavior and Additional Comments

Slow travel; one group

Wednesday, November 2, 2016 Sighting # 15

Initial sighting on Track

Time: 15:23 WP#: 107 Lat: 35.758604 Long: -74.721647
Vertical Angle: 3 Horizontal Bearing in Degrees: 120 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 1
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 15:24 WP#: 108 Lat: 35.764113 Long: -74.17716
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 3 / 3 / 3
Features used in Species ID: blunt head and black body

Representative images used for Species ID: 5957
Photographer: Erin Frame numbers: 5957 - 5960 Spacer: 5960
Calculated distance from Trackline: 1.54 km

Final Time and Position of Sighting

Time: 15:26 WP#: 109 Lat: 35.766720 Long: -74.716743
Calculated Distance Traveled: 0.48 km

Behavior and Additional Comments

Deep dives; evasive

Wednesday, November 2, 2016 Sighting # 16

Initial sighting on Track

Time: 15:33 WP#: 111 Lat: 35.758407 Long: -74.454540
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 40 Beaufort Sea State: 1
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 15:45 WP#: 112 Lat: 35.761566 Long: -74.454540
Species: *Kogia breviceps* Numbers (Low/High/Best): 7 / 7 / 7
Features used in Species ID: blunt snout, falcate dorsal fin, shark like appearance

Representative images used for Species ID: 5962, 5965, 5968
Photographer: Erin Frame numbers: 5961 - 5974 Spacer: 5974
Calculated distance from Trackline: 0.35 km

Final Time and Position of Sighting

Time: 15:46 WP#: 113 Lat: 35.759069 Long: -74.454678
Calculated Distance Traveled: 0.28 km

Behavior and Additional Comments

One group of seven individual kogiids. Animals dove deep and did not return to the surface.
The very large size of the individual animals indicates they are *Kogia breviceps*, not *K. sima*.

Wednesday, November 2, 2016 Sighting # 17

Initial sighting on Track

Time: 16:04 WP#: 121 Lat: 35.826223 Long: -74.642207
Vertical Angle: 1 Horizontal Bearing in Degrees: 45 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 2
Observer: Erin Observer side: Right

Actual Time and Position of Sighting

Time: 16:04 WP#: 122 Lat: 35.834404 Long: -74.648762
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 8 / 8 / 8
Features used in Species ID: blunt head and black body

Representative images used for Species ID: 5976, 5990
Photographer: Erin Frame numbers: 5975 - 5996 Spacer: 5996
Calculated distance from Trackline: 1.08 km

Final Time and Position of Sighting

Time: 16:06 WP#: 123 Lat: 35.829842 Long: -74.639251
Calculated Distance Traveled: 1.00 km

Behavior and Additional Comments

One small group traveling

Wednesday, November 2, 2016 Sighting # 18

Initial sighting on Track

Time: 16:08 WP#: 125 Lat: 35.826515 Long: -74.710556
Vertical Angle: 1 Horizontal Bearing in Degrees: 90 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 1
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 16:11 WP#: 126 Lat: 35.822476 Long: -74.710556
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 9 / 20 / 15
Features used in Species ID: blunt head and black body

Representative images used for Species ID: 6013
Photographer: Erin Frame numbers: 5997 - 6025 Spacer: 6025
Calculated distance from Trackline: 0.45 km

Final Time and Position of Sighting

Time: 16:11 WP#: 127 Lat: 35.821586 Long: -74.708970
Calculated Distance Traveled: 0.17 km

Behavior and Additional Comments

One medium group spread out

Wednesday, November 2, 2016 Sighting # 19

Initial sighting on Track

Time: 16:14 WP#: 130 Lat: 35.826981 Long: -74.810114
Vertical Angle: 2 Horizontal Bearing in Degrees: 110 Sighting Cue: Body
On/Off Effort: On Trackline: 41 Beaufort Sea State: 1
Observer: Tiffany Observer side: Left

Actual Time and Position of Sighting

Time: 16:15 WP#: 131 Lat: 35.820557 Long: -74.801935
Species: *Globicephala macrorhynchus* Numbers (Low/High/Best): 8 / 11 / 9
Features used in Species ID: Black body and blunt head

Representative images used for Species ID: 6035, 6046
Photographer: Erin Frame numbers: 6026 - 6049 Spacer: 6049
Calculated distance from Trackline: 1.03 km

Final Time and Position of Sighting

Time: 6:17 WP#: 132 Lat: 35.824721 Long: -74.806720
Calculated Distance Traveled: 0.63 km

Behavior and Additional Comments

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