

PROJECT STATUS REPORT (Subcontract NO.2152sa06-A)

REPORT DATE:	1 February 2009	REPORT PERIOD:	January 2009
CONTRACT NO:	N62470-02-D-9997	TASK ORDER:	105
GMI NUMBER:	17097-A1-05	PROJECT MGR:	Dan L. Wilkinson
CLIENT NAME:	LANTNAVFACENGCOM	TECHNICAL REP:	Joel Bell
PROJECT NAME:	Marine protected species baseline and long-term monitoring for the proposed Undersea Warfare Training Range (USWTR)		

1.0 WORK PERFORMED THIS REPORT PERIOD

The eastern seaboard of the US was again subjected to a number of weather systems during January. This resulted in frequent high winds and unfavorable sea states in the study area that restricted our field effort.

A. Aerial Surveys

Survey Effort

The UNCW aerial survey team conducted observations on January 22 flying lines 1 through 10. Table 1 summarizes the track lines surveyed (and sea state conditions); Table 2 summarizes the sightings made during these aerial surveys. The aerial survey team recorded loggerhead turtles and manta rays this month. Figure 1 shows the locations of the observations made on aerial surveys.

Table 1. Effort summary table for UNCW aerial surveys.

Date	Line	Sea State	Kilometers flown
22-Jan-09	1	3	73.8
22-Jan-09	2	3	74.3
22-Jan-09	3	3	75.0
22-Jan-09	4	3 to 4	74.6
22-Jan-09	5	3 to 4	74.5
22-Jan-09	6	3 to 4	74.4
22-Jan-09	7	3 to 4	74.8
22-Jan-09	8	3 to 4	75.6
22-Jan-09	9	3 to 4	73.4
22-Jan-09	10	3 to 4	74.6

Table 2. Sighting summary table for UNCW aerial surveys.

Date	Effort	Latitude	Longitude	Line	Species	Group Size
22-Jan-09	On	33.663	-76.868	2	<i>Caretta caretta</i>	2
22-Jan-09	On	33.549	-76.585	3	<i>Manta birostris</i>	2

B. Shipboard surveys

Survey Effort

High sea states restricted vessel survey effort to a single day in January. One survey (line 3) was attempted on January 27th. Survey conditions were poor (Beaufort 4) and deteriorated to unworkable conditions shortly after and the survey vessel returned to port.

Passive Acoustics

The HARP from Onslow Bay is ready for redeployment when an appropriate weather window opens.

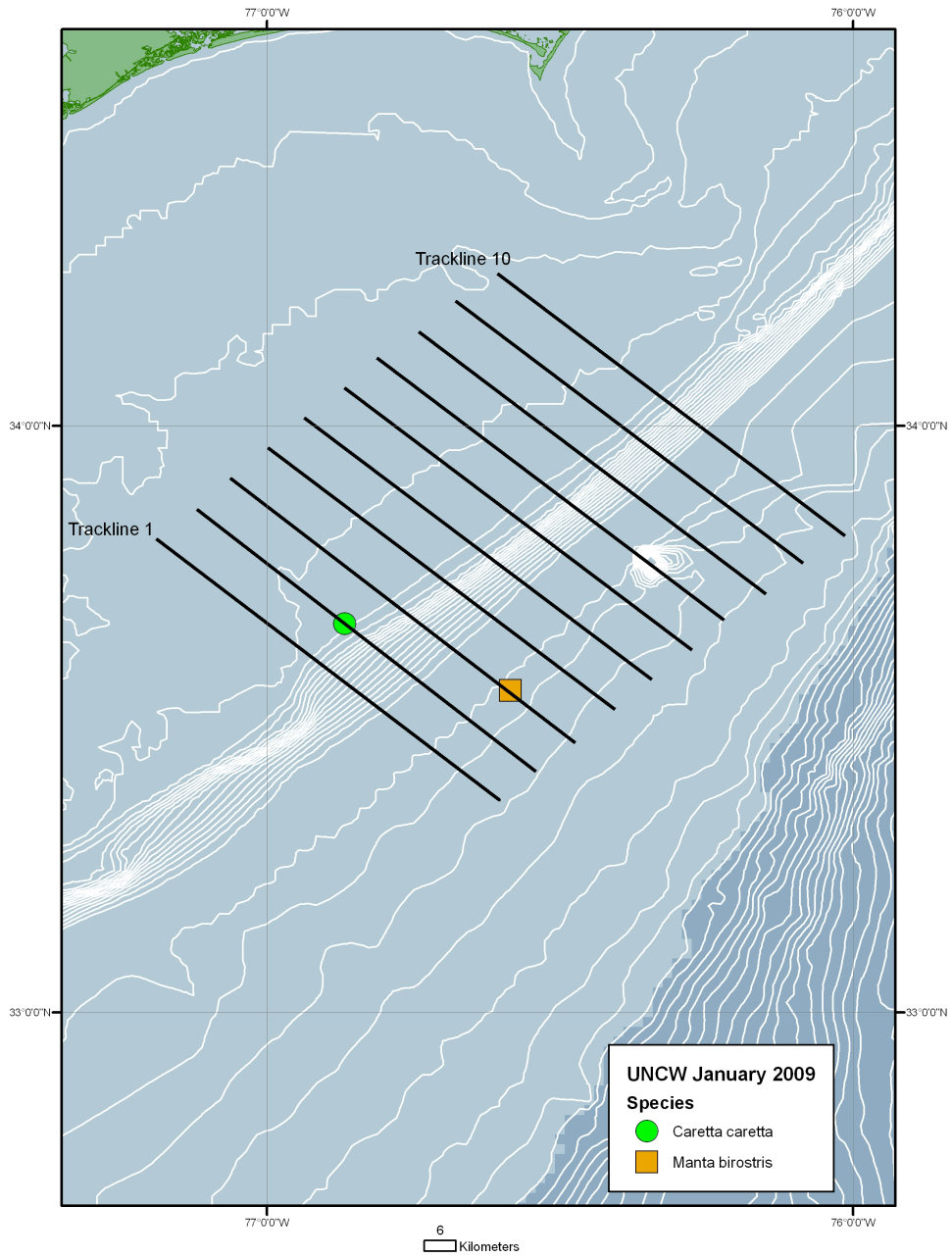


Figure 1. Location of sea turtle and fish sightings made during aerial surveys in January 2009. Refer to Table 1 and 2 for details.

PROJECT STATUS REPORT (Subcontract NO.2152sa06-A)

REPORT DATE:	1 March 2009	REPORT PERIOD:	February 2009
CONTRACT NO:	N62470-02-D-9997	TASK ORDER:	105
GMI NUMBER:	17097-A1-05	PROJECT MGR:	Dan L. Wilkinson
CLIENT NAME:	LANTNAVFACENGCOM	TECHNICAL REP:	Joel Bell
PROJECT NAME:	Marine protected species baseline and long-term monitoring for the proposed Undersea Warfare Training Range (USWTR)		

1.0 WORK PERFORMED THIS REPORT PERIOD

The eastern seaboard of the US was again subjected to a number of weather systems during February. This resulted in frequent high winds and unfavorable sea states in the study area that hampered our vessel field effort.

A. Aerial Surveys

Survey Effort

The UNCW aerial survey team conducted observations on February 7 and 17, flying lines 1 through 10 twice. Table 1 summarizes the track lines surveyed (and sea state conditions); Table 2 summarizes the sightings made during these aerial surveys. The aerial survey team recorded bottlenose dolphins, spotted dolphins, loggerhead sea turtles, manta rays, hammerhead sharks (*Sphyrna* sp) and ocean sunfish (*Mola mola*) this month. Figure 1 shows the locations of the observations made on aerial surveys.

Table 1. Effort summary table for UNCW aerial surveys.

Date	Line	Sea State	Kilometers flown
7-Feb-09	5	2 to 3	73.9
7-Feb-09	6	2 to 3	71.8
7-Feb-09	7	2 to 3	74.2
7-Feb-09	8	2 to 3	66.8
7-Feb-09	9	2 to 3	73.1
7-Feb-09	10	2 to 3	74.3
7-Feb-09	4	3	74.2
7-Feb-09	3	3	73.8
7-Feb-09	2	3	72.6
7-Feb-09	1	3	74.6
17-Feb-09	5	4	74.4
17-Feb-09	6	3 to 4	74.6
17-Feb-09	7	3 to 4	73.4
17-Feb-09	8	3 to 4	74.8
17-Feb-09	4	3 to 4	74.4
17-Feb-09	3	3 to 4	74.2
17-Feb-09	2	3	73.9
17-Feb-09	1	3 to 4	75.5
17-Feb-09	9	3 to 4	71.8
17-Feb-09	10	2 to 4	74.1

Table 2. Sighting summary table for UNCW aerial surveys.

Date	Effort	Latitude	Longitude	Line	Species	Group Size
7-Feb-09	On	33.8342	-76.6993	5	<i>Caretta caretta</i>	1
7-Feb-09	On	33.7085	-76.4125	6	<i>Tursiops truncatus</i>	50
7-Feb-09	On	33.8751	-76.6139	6	<i>Caretta caretta</i>	1
7-Feb-09	On	33.9424	-76.7058	6	<i>Caretta caretta</i>	1
7-Feb-09	On	33.9594	-76.7291	6	<i>Unid. Turtle</i>	1
7-Feb-09	On	34.0227	-76.6746	7	<i>Unid. Turtle</i>	1
7-Feb-09	On	33.922	-76.5421	7	<i>Mola mola</i>	1
7-Feb-09	On	33.8909	-76.3719	8	<i>Unid. Turtle</i>	1
7-Feb-09	On	33.9398	-76.4337	8	<i>Sphyrna sp</i>	1
7-Feb-09	On	33.942	-76.4361	8	<i>Sphyrna sp</i>	1
7-Feb-09	On	34.1365	-76.6998	8	<i>Caretta caretta</i>	1
7-Feb-09	On	33.795	-76.1222	9	<i>Caretta caretta</i>	2
7-Feb-09	On	33.8856	-76.1065	10	<i>Unid. Turtle</i>	1
7-Feb-09	On	33.974	-76.2158	10	<i>Tursiops truncatus</i>	30
7-Feb-09	On	34.0192	-76.2826	10	<i>Manta birostris</i>	2
7-Feb-09	On	34.0599	-76.3288	10	<i>Manta birostris</i>	1
7-Feb-09	On	33.9365	-76.9568	4	<i>Unid. Turtle</i>	1
7-Feb-09	On	33.7037	-76.7831	3	<i>Caretta caretta</i>	1
7-Feb-09	On	33.7164	-76.7987	3	<i>Caretta caretta</i>	3
7-Feb-09	On	33.7284	-76.8139	3	<i>Manta birostris</i>	1
7-Feb-09	On	33.792	-76.899	3	<i>Stenella frontalis</i>	40
7-Feb-09	On	33.6588	-76.8648	2	<i>Caretta caretta</i>	1
7-Feb-09	On	33.6429	-76.8334	2	<i>Stenella frontalis</i>	90
7-Feb-09	On	33.6085	-76.9234	1	<i>Caretta caretta</i>	1
17-Feb-09	On	33.9577	-76.729	6	<i>Caretta caretta</i>	1
17-Feb-09	On	33.731	-76.2939	7	<i>Manta birostris</i>	2
17-Feb-09	On	33.6693	-76.2112	7	<i>Manta birostris</i>	1
17-Feb-09	On	33.793	-76.2476	8	<i>Manta birostris</i>	1
17-Feb-09	On	33.9008	-76.9114	4	<i>Caretta caretta</i>	1
17-Feb-09	On	33.8725	-76.8732	4	<i>Caretta caretta</i>	1
17-Feb-09	On	33.6909	-76.8976	2	<i>Caretta caretta</i>	1
17-Feb-09	On	33.6782	-76.8813	2	<i>Caretta caretta</i>	1
17-Feb-09	On	33.6417	-76.971	1	<i>Caretta caretta</i>	1
17-Feb-09	On	33.6627	-76.9938	1	<i>Manta birostris</i>	2
17-Feb-09	On	33.716	-77.0673	1	<i>Caretta caretta</i>	1
17-Feb-09	On	33.7813	-77.153	1	<i>Caretta caretta</i>	1
17-Feb-09	On	33.7862	-77.1594	1	<i>Caretta caretta</i>	1
17-Feb-09	On	33.7902	-77.1647	1	<i>Caretta caretta</i>	1
17-Feb-09	On	34.0863	-76.5006	9	<i>Stenella frontalis</i>	30
17-Feb-09	On	33.9238	-76.288	9	<i>Manta birostris</i>	2
17-Feb-09	On	34.1868	-76.5015	10	<i>Caretta caretta</i>	1
17-Feb-09	On	34.2518	-76.585	10	<i>Caretta caretta</i>	1

B. Shipboard surveys

Survey Effort

Vessel surveys were conducted as planned during February 2009. One survey (line 5) was completed on February 21, surveying 40nm of trackline. Two boats (RV Cetus and MV Sensation) attempted surveys again on February 25. One boat (Sensation) surveyed portions of line 3 and line 6 and completed approximately 40nm of trackline. The second boat (Cetus) conducted a photo identification/biopsy and passive acoustics survey along the shelf break but returned to port after surveying approximately 15nm because of deteriorating weather conditions. These surveys generated sightings of bottlenose dolphins and loggerhead turtles, detailed in Table 3 and on Figure 1.

Table 3. Marine mammal and turtles sightings generated during vessel-based surveys in February 2009

Date	Latitude	Longitude	Species	Group Size	Effort
2/21/09	33.71065263	-76.54341256	<i>Tursiops truncatus</i>	4	On
2/21/09	33.80409758	-76.66705219	<i>Caretta caretta</i>	1	On
2/21/09	33.81307719	-76.68118077	<i>Caretta caretta</i>	1	On
2/21/09	33.82325749	-76.69298534	<i>Caretta caretta</i>	1	On
2/21/09	33.8306449	-76.69651362	<i>Caretta caretta</i>	1	On
2/21/09	33.84941843	-76.73282251	<i>Caretta caretta</i>	1	On
2/21/09	33.87734945	-76.767203	<i>Caretta caretta</i>	1	On
2/21/09	33.92705678	-76.83415403	<i>Caretta caretta</i>	1	On
2/21/09	33.99017181	-76.89952278	<i>Caretta caretta</i>	1	On
2/21/09	33.97914454	-76.88529056	<i>Caretta caretta</i>	1	On
2/25/09	33.85727058	-76.50501259	<i>Caretta caretta</i>	1	On
2/25/09	34.03603563	-76.8370156	<i>Tursiops truncatus</i>	2	On

Passive Acoustics

We deployed the towed array on two days during February 2009. On February 21st, we deployed the hydrophone array from the *F/V Sensation* for 4.1 hours of combined visual and acoustic survey. During this time, there was one acoustic detection that occurred between 10:33 - 11:45. This group of animals was also visually detected and identified as *Tursiops truncatus*. On February 25th, we deployed the hydrophone array from the *R/V Cetus* during a Photo-ID/biopsy cruise. During the 2.1 hours of combined survey effort, we made no acoustic detections while on effort. However, as weather conditions turned less favorable, we did go off effort to secure the vessel and equipment and during that time, faint whistles were heard for two minutes (11:56 – 11:57) right before we retrieved the array. The HARP from Onslow Bay is ready for redeployment when weather conditions improve.

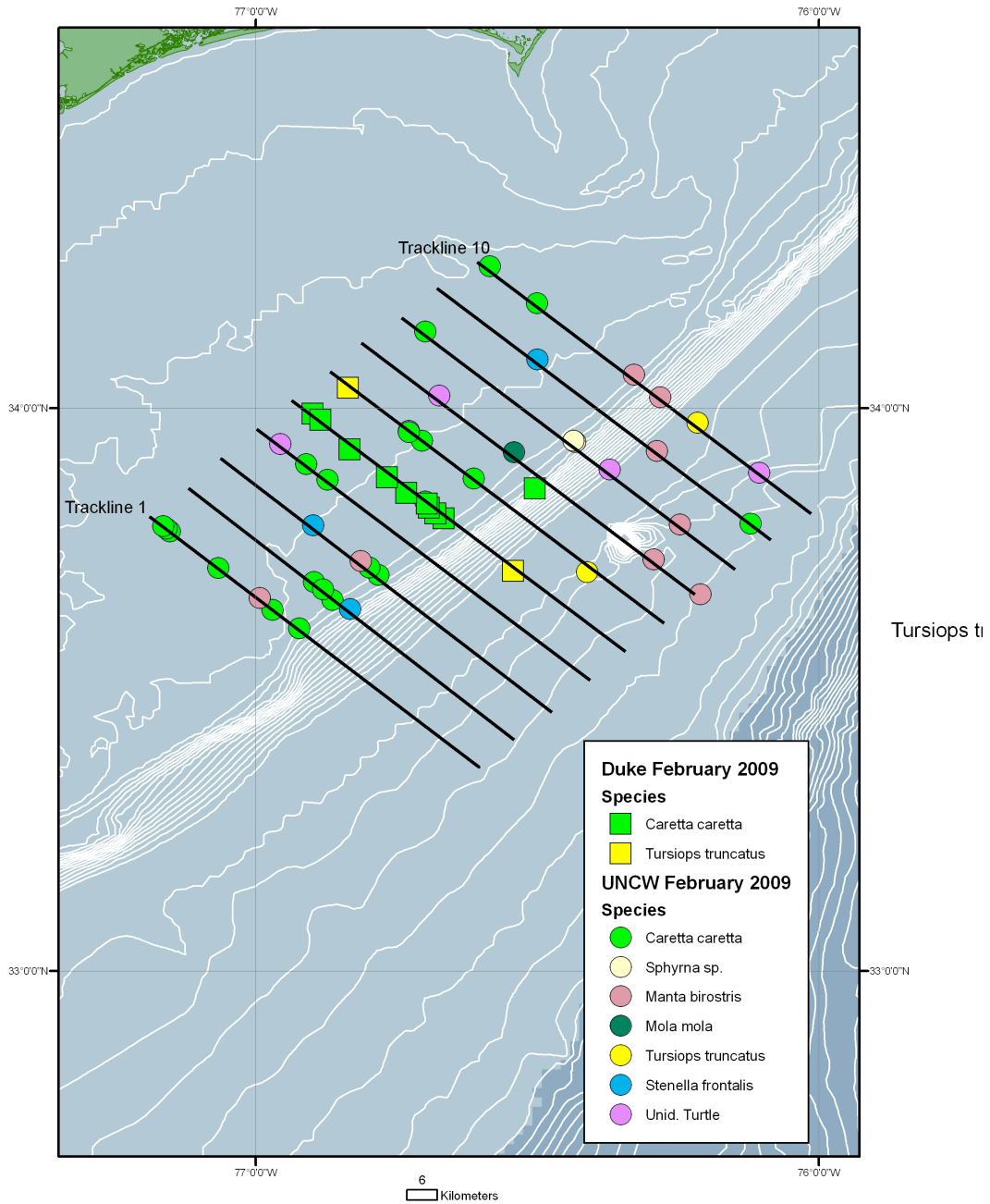


Figure 1. Location of cetacean, fish and sea turtle sightings made during aerial and vessel surveys in February 2009. Refer to Table 1, 2 and 3 for details.

PROJECT STATUS REPORT (Subcontract NO.2152sa06-A)

REPORT DATE:	1 April 2009	REPORT PERIOD:	March 2009
CONTRACT NO:	N62470-02-D-9997	TASK ORDER:	105
GMI NUMBER:	17097-A1-05	PROJECT MGR:	Dan L. Wilkinson
CLIENT NAME:	LANTNAVFACENGCOM	TECHNICAL REP:	Joel Bell
PROJECT NAME:	Marine protected species baseline and long-term monitoring for the proposed Onslow Bay Undersea Warfare Training Range (USWTR)		

1.0 WORK PERFORMED THIS REPORT PERIOD

The eastern seaboard of the US was again subjected to a number of weather systems during March. This resulted in frequent high winds and unfavorable sea states in the study area that restricted our field effort. Despite these unfavorable conditions, both aerial and vessel-based surveys were conducted as planned.

A. Aerial Surveys

Survey Effort

The UNCW aerial survey team conducted observations on March 4th and 5th; flying lines 1 through 10 twice. Table 1 summarizes the track lines surveyed and sea state conditions. Table 2 summarizes the sightings made during these aerial surveys. The aerial survey team recorded bottlenose dolphins (*Tursiops truncatus*), spotted dolphins (*Stenella frontalis*), ocean sunfish (*Mola mola*), hammerhead sharks (*Sphyrna sp*), loggerhead turtles (*Caretta caretta*) and manta rays (*Manta birostris*) this month, as well as sightings of unidentified rays, turtles and one unidentified dolphin. Figure 1 shows the locations of the observations made on aerial surveys.

Table 1. Effort summary table for UNCW aerial surveys.

Date	Line	Sea State	Kilometers flown
4-Mar-2009	5	3 to 4	74.01
4-Mar-2009	6	3 to 4	73.70
4-Mar-2009	7	3 to 4	74.12
4-Mar-2009	8	3 to 4	72.09
4-Mar-2009	9	3	72.54
4-Mar-2009	10	3 to 4	74.52
4-Mar-2009	4	2 to 4	72.36
4-Mar-2009	3	2 to 4	75.05
4-Mar-2009	2	2 to 4	72.38
4-Mar-2009	1	2 to 4	74.29
5-Mar-2009	10	1 to 3	72.26
5-Mar-2009	9	1 to 3	71.97
5-Mar-2009	8	1 to 3	74.82
5-Mar-2009	7	1 to 3	73.07
5-Mar-2009	6	1 to 2	72.83
5-Mar-2009	5	1 to 2	74.47
5-Mar-2009	4	1 to 2	74.01
5-Mar-2009	3	2 to 3	74.09
5-Mar-2009	2	2 to 3	74.47
5-Mar-2009	1	1 to 3	73.84

Table 2. Sighting summary table for UNCW aerial surveys.

Date	Time	Effort	Latitude	Longitude	Track	Species	Group Size
4-Mar-09	9:48	On	33.62179	-76.42313	5	<i>Manta birostris</i>	1
4-Mar-09	9:55	On	33.63360	-76.30544	6	Unid. Ray	1
4-Mar-09	9:56	On	33.64819	-76.32345	6	<i>Manta birostris</i>	1
4-Mar-09	10:09	On	33.92450	-76.68273	6	<i>Caretta caretta</i>	1
4-Mar-09	10:10	On	33.94429	-76.71601	6	<i>Caretta caretta</i>	1
4-Mar-09	10:10	On	33.95278	-76.73397	6	<i>Caretta caretta</i>	1
4-Mar-09	10:12	On	33.99193	-76.77741	6	<i>Caretta caretta</i>	1
4-Mar-09	10:25	On	33.99943	-76.64406	7	<i>Manta birostris</i>	1
4-Mar-09	10:26	On	33.97432	-76.60628	7	<i>Caretta caretta</i>	1
4-Mar-09	10:39	On	33.70417	-76.25906	7	Unid. Ray	1
4-Mar-09	10:45	On	33.74418	-76.18563	8	Unid Dephinid	3
4-Mar-09	11:10	On	34.06369	-76.58374	8	<i>Caretta caretta</i>	1
4-Mar-09	11:15	On	34.16598	-76.73354	8	<i>Caretta caretta</i>	1
4-Mar-09	11:59	On	34.16817	-76.47831	10	<i>Caretta caretta</i>	1
4-Mar-09	11:59	On	34.18034	-76.49330	10	<i>Caretta caretta</i>	1
4-Mar-09	12:01	On	34.21446	-76.53330	10	<i>Caretta caretta</i>	1
4-Mar-09	14:16	On	33.77084	-76.73418	4	<i>Stenella frontalis</i>	15
4-Mar-09	14:48	On	33.71652	-76.80078	3	<i>Caretta caretta</i>	1
4-Mar-09	14:48	On	33.69708	-76.77419	3	<i>Manta birostris</i>	1
4-Mar-09	14:51	On	33.76489	-76.86820	3	<i>Caretta caretta</i>	1
4-Mar-09	14:54	On	33.84181	-76.96561	3	<i>Caretta caretta</i>	1
4-Mar-09	14:57	On	33.90529	-77.04721	3	<i>Caretta caretta</i>	1
4-Mar-09	15:04	On	33.78646	-77.04122	2	<i>Caretta caretta</i>	1
4-Mar-09	15:04	On	33.77681	-77.02988	2	<i>Caretta caretta</i>	1
4-Mar-09	15:05	On	33.76447	-77.01292	2	<i>Caretta caretta</i>	1
4-Mar-09	15:05	On	33.75470	-77.00004	2	<i>Caretta caretta</i>	1
4-Mar-09	15:09	On	33.69070	-76.90664	2	<i>Caretta caretta</i>	1
4-Mar-09	15:09	On	33.67673	-76.89248	2	<i>Caretta caretta</i>	1
4-Mar-09	15:10	On	33.67238	-76.88614	2	<i>Stenella frontalis</i>	16
4-Mar-09	15:45	On	33.48177	-76.75908	1	<i>Caretta caretta</i>	1
4-Mar-09	15:52	On	33.63159	-76.94897	1	<i>Caretta caretta</i>	2
4-Mar-09	15:53	On	33.64837	-76.97468	1	<i>Caretta caretta</i>	2
4-Mar-09	15:58	On	33.75078	-77.11255	1	<i>Caretta caretta</i>	2
4-Mar-09	15:59	On	33.78535	-77.15944	1	<i>Caretta caretta</i>	1
5-Mar-09	9:12	On	34.25928	-76.59248	10	<i>Caretta caretta</i>	1
5-Mar-09	9:13	On	34.23155	-76.55506	10	<i>Caretta caretta</i>	1
5-Mar-09	9:14	On	34.22105	-76.54672	10	<i>Caretta caretta</i>	1
5-Mar-09	9:15	On	34.19441	-76.52275	10	<i>Caretta caretta</i>	1
5-Mar-09	9:16	On	34.17312	-76.49688	10	<i>Caretta caretta</i>	1
5-Mar-09	9:17	On	34.15250	-76.46714	10	<i>Caretta caretta</i>	1
5-Mar-09	9:17	On	34.14586	-76.45664	10	<i>Caretta caretta</i>	1
5-Mar-09	9:19	On	34.11452	-76.41141	10	<i>Caretta caretta</i>	1
5-Mar-09	9:22	On	34.11399	-76.41024	10	<i>Stenella frontalis</i>	4
5-Mar-09	9:37	On	34.03469	-76.30565	10	<i>Caretta caretta</i>	1
5-Mar-09	9:39	On	33.99163	-76.24831	10	<i>Caretta caretta</i>	1
5-Mar-09	9:40	On	33.97038	-76.22080	10	<i>Caretta caretta</i>	1
5-Mar-09	9:42	On	33.96403	-76.20843	10	Unid. Ray	2
5-Mar-09	9:49	On	33.83522	-76.04997	10	<i>Manta birostris</i>	1

5-Mar-09	10:09	On	34.09381	-76.51945	9	<i>Stenella frontalis</i>	20
5-Mar-09	10:15	On	34.11548	-76.54103	9	<i>Caretta caretta</i>	1
5-Mar-09	10:17	On	34.17110	-76.61488	9	<i>Caretta caretta</i>	1
5-Mar-09	10:19	On	34.20782	-76.66400	9	<i>Caretta caretta</i>	1
5-Mar-09	10:19	On	34.20302	-76.65662	9	<i>Caretta caretta</i>	1
5-Mar-09	10:23	On	34.15076	-76.71926	8	<i>Caretta caretta</i>	1
5-Mar-09	10:23	On	34.14721	-76.71607	8	Unid. Turtle	1
5-Mar-09	10:24	On	34.13676	-76.70154	8	<i>Caretta caretta</i>	2
5-Mar-09	10:26	On	34.12227	-76.67842	8	<i>Stenella frontalis</i>	25
5-Mar-09	10:37	On	34.04613	-76.58513	8	<i>Tursiops truncatus</i>	2
5-Mar-09	10:42	On	34.00486	-76.52747	8	<i>Caretta caretta</i>	1
5-Mar-09	10:44	On	33.99223	-76.52065	8	<i>Stenella frontalis</i>	8
5-Mar-09	10:51	On	33.95265	-76.46143	8	<i>Mola mola</i>	1
5-Mar-09	11:04	On	33.77462	-76.22285	8	Unid. Ray	1
5-Mar-09	11:23	On	33.69118	-76.21148	7	<i>Tursiops truncatus</i>	5
5-Mar-09	11:28	On	33.76789	-76.33835	7	<i>Caretta caretta</i>	1
5-Mar-09	11:33	On	33.88832	-76.49073	7	<i>Caretta caretta</i>	1
5-Mar-09	11:33	On	33.87778	-76.47658	7	<i>Caretta caretta</i>	1
5-Mar-09	11:33	On	33.89218	-76.49599	7	<i>Caretta caretta</i>	1
5-Mar-09	11:35	On	33.92397	-76.54153	7	<i>Caretta caretta</i>	1
5-Mar-09	11:38	On	34.00301	-76.64704	7	<i>Caretta caretta</i>	1
5-Mar-09	11:39	On	34.01702	-76.66699	7	<i>Caretta caretta</i>	4
5-Mar-09	11:40	On	34.05577	-76.71944	7	<i>Caretta caretta</i>	1
5-Mar-09	11:41	On	34.06328	-76.73275	7	Unid. Turtle	2
5-Mar-09	11:47	On	34.05299	-76.85891	6	<i>Caretta caretta</i>	1
5-Mar-09	11:48	On	34.02505	-76.82550	6	<i>Caretta caretta</i>	1
5-Mar-09	11:49	On	34.00133	-76.78733	6	<i>Caretta caretta</i>	1
5-Mar-09	11:55	On	33.95823	-76.73216	6	Unid. Turtle	1
5-Mar-09	11:56	On	33.94827	-76.71776	6	<i>Caretta caretta</i>	1
5-Mar-09	11:58	On	33.90588	-76.65826	6	<i>Caretta caretta</i>	1
5-Mar-09	11:59	On	33.89721	-76.65398	6	<i>Stenella frontalis</i>	24
5-Mar-09	12:07	On	33.87356	-76.61396	6	<i>Caretta caretta</i>	1
5-Mar-09	12:07	On	33.87766	-76.61875	6	Unid. Turtle	1
5-Mar-09	12:16	On	33.66566	-76.34242	6	<i>Sphyrna sp.</i>	1
5-Mar-09	12:34	On	33.80512	-76.65879	5	<i>Caretta caretta</i>	1
5-Mar-09	12:34	On	33.80556	-76.65956	5	<i>Caretta caretta</i>	1
5-Mar-09	12:36	On	33.85420	-76.71706	5	<i>Caretta caretta</i>	1
5-Mar-09	12:38	On	33.90157	-76.76402	5	<i>Stenella frontalis</i>	35
5-Mar-09	12:57	On	33.94694	-76.84448	5	<i>Caretta caretta</i>	1
5-Mar-09	12:58	On	33.97298	-76.87595	5	<i>Caretta caretta</i>	3
5-Mar-09	15:11	On	33.94737	-76.97766	4	<i>Caretta caretta</i>	1
5-Mar-09	15:12	On	33.91465	-76.93277	4	<i>Caretta caretta</i>	1
5-Mar-09	15:13	On	33.89683	-76.90867	4	<i>Caretta caretta</i>	1
5-Mar-09	15:15	On	33.84977	-76.85580	4	<i>Caretta caretta</i>	1
5-Mar-09	15:17	On	33.80639	-76.78201	4	<i>Caretta caretta</i>	1
5-Mar-09	15:18	On	33.78931	-76.75701	4	<i>Caretta caretta</i>	1
5-Mar-09	15:18	On	33.76743	-76.72787	4	<i>Caretta caretta</i>	1
5-Mar-09	15:36	On	33.59218	-76.64263	3	Unid. Ray	1
5-Mar-09	15:42	On	33.71329	-76.80230	3	<i>Caretta caretta</i>	1
5-Mar-09	15:42	On	33.72654	-76.81923	3	<i>Caretta caretta</i>	1
5-Mar-09	15:43	On	33.73850	-76.83458	3	<i>Caretta caretta</i>	1
5-Mar-09	15:43	On	33.74475	-76.84296	3	<i>Caretta caretta</i>	1
5-Mar-09	15:43	On	33.75787	-76.86245	3	<i>Mola mola</i>	1
5-Mar-09	15:44	On	33.77847	-76.89859	3	<i>Caretta caretta</i>	1

5-Mar-09	15:49	On	33.89874	-77.04071	3	<i>Caretta caretta</i>	1
5-Mar-09	15:54	On	33.82979	-77.08247	2	<i>Caretta caretta</i>	1
5-Mar-09	15:55	On	33.80571	-77.05026	2	<i>Caretta caretta</i>	1
5-Mar-09	15:57	On	33.76199	-76.99330	2	<i>Caretta caretta</i>	1
5-Mar-09	15:59	On	33.72383	-76.94661	2	<i>Caretta caretta</i>	1
5-Mar-09	16:00	On	33.67828	-76.88699	2	<i>Caretta caretta</i>	3
5-Mar-09	16:00	On	33.69765	-76.91326	2	Unid. Turtle	1
5-Mar-09	16:01	On	33.66595	-76.86962	2	<i>Caretta caretta</i>	1
5-Mar-09	16:01	On	33.66854	-76.87324	2	<i>Caretta caretta</i>	2
5-Mar-09	16:02	On	33.65175	-76.85134	2	<i>Caretta caretta</i>	1
5-Mar-09	16:02	On	33.63986	-76.83693	2	<i>Sphyrna sp.</i>	4
5-Mar-09	16:26	On	33.64148	-76.96785	1	<i>Caretta caretta</i>	1
5-Mar-09	16:26	On	33.65419	-76.98476	1	<i>Caretta caretta</i>	1
5-Mar-09	16:29	On	33.69901	-77.03016	1	<i>Stenella frontalis</i>	30
5-Mar-09	16:33	On	33.74830	-77.10627	1	<i>Caretta caretta</i>	1
5-Mar-09	16:34	On	33.78494	-77.15565	1	Unid. Turtle	1

B. Shipboard surveys

Survey Effort

High sea states restricted vessel survey effort to a single day in March. One survey (line 3) was surveyed on March 5th. No marine mammals were sighted during this survey, although 13 loggerhead sea turtles were sighted. Table 3 provides the details for these sightings and the locations of the sightings are presented in Figure 1.

Table 3. Sighting summary table for Duke vessel-based surveys.

Date	Time	Latitude	Longitude	Effort	Species	Group Size
3/5/09	11:56	33.6789	-76.7741	On	<i>Caretta caretta</i>	1
3/5/09	12:06	33.6976	-76.8033	On	<i>Caretta caretta</i>	1
3/5/09	12:06	33.7001	-76.8056	On	<i>Caretta caretta</i>	1
3/5/09	12:10	33.7050	-76.8068	On	<i>Caretta caretta</i>	1
3/5/09	12:13	33.7177	-76.8138	On	<i>Caretta caretta</i>	1
3/5/09	12:15	33.7159	-76.8179	On	<i>Caretta caretta</i>	1
3/5/09	12:20	33.7266	-76.8303	On	<i>Caretta caretta</i>	1
3/5/09	12:28	33.7424	-76.8502	On	<i>Caretta caretta</i>	1
3/5/09	12:59	33.8005	-76.9151	On	<i>Caretta caretta</i>	1
3/5/09	13:44	33.8782	-77.0207	On	<i>Caretta caretta</i>	1
3/5/09	13:52	33.8922	-77.0366	On	<i>Caretta caretta</i>	1
3/5/09	13:55	33.8941	-77.0575	On	<i>Caretta caretta</i>	1
3/5/09	14:00	33.9063	-77.0558	On	<i>Caretta caretta</i>	1

Passive Acoustics

We did not detect any vocalizing marine mammals with the towed array on March 5th despite 4.2 hours of combined visual and acoustic survey effort. The HARP from Onslow Bay is ready for redeployment when an appropriate weather window occurs.

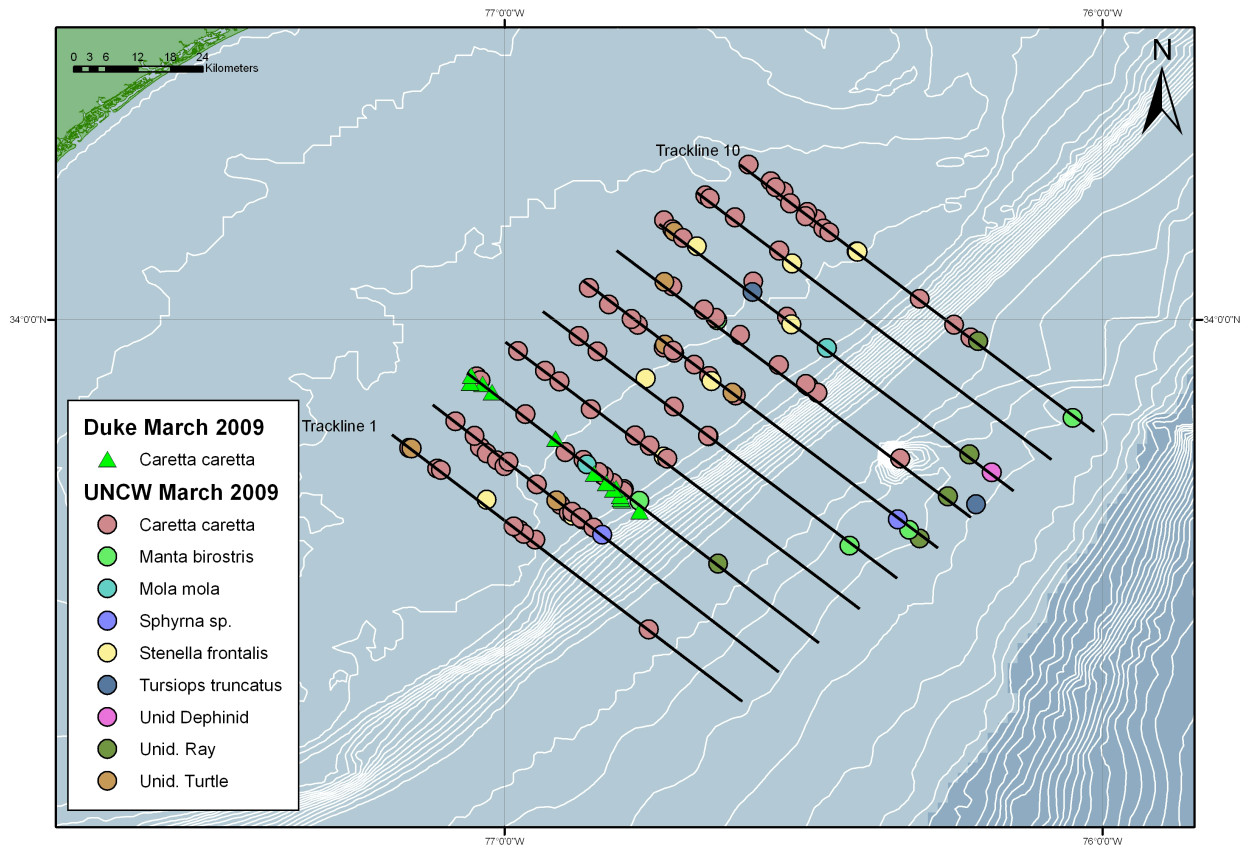


Figure 1. Location of delphinid, sea turtle and fish sightings made during aerial and vessel-based surveys in March 2009. Refer to Table 1, 2 and 3 for details.

PROJECT STATUS REPORT (Subcontract NO.2152sa06-A)

REPORT DATE:	1 May 2009	REPORT PERIOD:	April 2009
CONTRACT NO:	N62470-02-D-9997	TASK ORDER:	105
GMI NUMBER:	17097-A1-05	PROJECT MGR:	Dan L. Wilkinson
CLIENT NAME:	LANTNAVFACENGCOM	TECHNICAL REP:	Joel Bell
PROJECT NAME:	Marine protected species baseline and long-term monitoring for the proposed Onslow Bay Undersea Warfare Training Range (USWTR)		

1.0 WORK PERFORMED THIS REPORT PERIOD

The eastern seaboard of the US was again subjected to a number of weather systems during most of the month of April. This resulted in frequent high winds and unfavorable sea states in the study area that restricted our field effort. Despite these unfavorable conditions, both aerial and vessel-based surveys were conducted as planned.

A. Aerial Surveys

Survey Effort

The UNCW aerial survey team conducted observations on April 24th and 25th, covering track lines 1 through 10 once. Table 1 summarizes the track lines surveyed and sea state conditions and Table 2 summarizes the sightings made during these aerial surveys. The aerial survey team recorded bottlenose dolphins (*Tursiops truncatus*), large groups of spotted dolphins (*Stenella frontalis*), loggerhead turtles (*Caretta caretta*), ocean sunfish (*Mola mola*), and a hammerhead shark (*Sphyrna sp*), this month, as well as sightings of unidentified turtles. Figures 1 and 2 show the locations of the observations made on the aerial surveys.

Table 1. Effort summary table for UNCW aerial surveys.

Date	Line	Sea State	Kilometers flown
24-Apr-2009	10	1	74.5
24-Apr-2009	9	1	72.5
24-Apr-2009	8	1 to 3	75.2
24-Apr-2009	7	1 to 3	72.4
24-Apr-2009	6	1 to 3	73.9
24-Apr-2009	5	1 to 4	74.3
25-Apr-2009	4	2 to 4	75.6
25-Apr-2009	3	2 to 3	75.0
25-Apr-2009	2	2 to 3	74.5
25-Apr-2009	1	2 to 3	74.8

Table 2. Sighting summary table for UNCW aerial surveys.

Date	Time	Effort	Latitude	Longitude	Track	Species	Group Size
24-Apr-09	9:33	On	34.267071	-76.602777	10	<i>Caretta caretta</i>	1
24-Apr-09	9:35	On	34.221797	-76.532724	10	<i>Caretta caretta</i>	1
24-Apr-09	9:48	On	34.151427	-76.468262	10	<i>Stenella frontalis</i>	55
24-Apr-09	10:02	On	34.118761	-76.402646	10	<i>Caretta caretta</i>	2

24-Apr-09	10:03	On	34.111250	-76.398725	10	Unid. Turtle	2
24-Apr-09	10:04	On	34.094298	-76.375619	10	<i>Caretta caretta</i>	1
24-Apr-09	10:05	On	34.070895	-76.341670	10	<i>Caretta caretta</i>	1
24-Apr-09	10:11	On	33.969252	-76.195643	10	<i>Tursiops truncatus</i>	10
24-Apr-09	10:23	On	33.871845	-76.097792	10	<i>Tursiops truncatus</i>	10
24-Apr-09	10:31	On	33.854811	-76.077586	10	<i>Caretta caretta</i>	1
24-Apr-09	10:45	On	33.883920	-76.255597	9	<i>Tursiops truncatus</i>	15
24-Apr-09	10:57	On	34.012194	-76.407013	9	<i>Caretta caretta</i>	1
24-Apr-09	10:58	On	34.012365	-76.406003	9	<i>Stenella frontalis</i>	80
24-Apr-09	11:08	On	34.058745	-76.470241	9	<i>Caretta caretta</i>	1
24-Apr-09	11:08	On	34.067309	-76.481896	9	<i>Caretta caretta</i>	2
24-Apr-09	11:08	On	34.049851	-76.457049	9	<i>Caretta caretta</i>	1
24-Apr-09	11:08	On	34.062886	-76.476010	9	<i>Caretta caretta</i>	1
24-Apr-09	11:11	On	34.124932	-76.550406	9	<i>Caretta caretta</i>	2
24-Apr-09	11:11	On	34.128446	-76.555005	9	<i>Caretta caretta</i>	2
24-Apr-09	11:11	On	34.117200	-76.540516	9	<i>Caretta caretta</i>	1
24-Apr-09	11:12	On	34.141468	-76.572734	9	<i>Caretta caretta</i>	1
24-Apr-09	11:13	On	34.170821	-76.617597	9	<i>Caretta caretta</i>	1
24-Apr-09	11:13	On	34.157560	-76.596036	9	<i>Caretta caretta</i>	1
24-Apr-09	11:13	On	34.171268	-76.618321	9	<i>Caretta caretta</i>	1
24-Apr-09	11:14	On	34.187332	-76.643437	9	<i>Caretta caretta</i>	1
24-Apr-09	11:14	On	34.194347	-76.654788	9	Unid. Turtle	1
24-Apr-09	11:19	On	34.164618	-76.733617	8	<i>Caretta caretta</i>	1
24-Apr-09	11:19	On	34.159609	-76.725310	8	<i>Caretta caretta</i>	1
24-Apr-09	11:19	On	34.162582	-76.730074	8	<i>Caretta caretta</i>	2
24-Apr-09	11:20	On	34.141372	-76.700966	8	<i>Caretta caretta</i>	1
24-Apr-09	11:23	On	34.129500	-76.679869	8	<i>Tursiops truncatus</i>	2
24-Apr-09	11:37	On	34.030129	-76.556001	8	<i>Caretta caretta</i>	1
24-Apr-09	11:37	On	34.029088	-76.554367	8	<i>Caretta caretta</i>	1
24-Apr-09	11:37	On	34.021506	-76.542386	8	<i>Caretta caretta</i>	1
24-Apr-09	11:38	On	33.999129	-76.512543	8	<i>Caretta caretta</i>	1
24-Apr-09	11:39	On	33.991338	-76.503323	8	Unid. Turtle	1
24-Apr-09	11:43	On	33.919818	-76.385878	8	<i>Mola mola</i>	1
24-Apr-09	12:02	On	33.739365	-76.318960	7	<i>Tursiops truncatus</i>	32
24-Apr-09	12:19	On	33.898299	-76.510713	7	<i>Sphyrna sp.</i>	1
24-Apr-09	12:20	On	33.925264	-76.550127	7	<i>Caretta caretta</i>	1
24-Apr-09	12:21	On	33.946672	-76.575784	7	Unid. Turtle	2
24-Apr-09	12:22	On	33.944397	-76.589046	7	<i>Tursiops truncatus</i>	10
24-Apr-09	12:32	On	33.996132	-76.648635	7	<i>Stenella frontalis</i>	37
24-Apr-09	12:38	On	34.052584	-76.715796	7	Unid. Turtle	1
24-Apr-09	12:39	On	34.063458	-76.741129	7	<i>Tursiops truncatus</i>	9
24-Apr-09	12:46	On	34.103790	-76.783318	7	<i>Caretta caretta</i>	1
24-Apr-09	14:52	On	34.057227	-76.860930	6	<i>Caretta caretta</i>	1
24-Apr-09	14:52	On	34.039952	-76.838541	6	<i>Caretta caretta</i>	1
24-Apr-09	14:52	On	34.040780	-76.839376	6	<i>Caretta caretta</i>	1
24-Apr-09	14:53	On	34.018162	-76.809557	6	<i>Caretta caretta</i>	1
24-Apr-09	14:55	On	33.988536	-76.768749	6	<i>Caretta caretta</i>	1
24-Apr-09	14:56	On	33.975468	-76.751264	6	<i>Caretta caretta</i>	1
24-Apr-09	14:56	On	33.973914	-76.748907	6	<i>Caretta caretta</i>	1
24-Apr-09	14:57	On	33.940844	-76.704275	6	<i>Caretta caretta</i>	1

24-Apr-09	14:58	On	33.918651	-76.675768	6	<i>Caretta caretta</i>	1
24-Apr-09	14:58	On	33.914387	-76.670629	6	<i>Caretta caretta</i>	2
24-Apr-09	14:59	On	33.910982	-76.666686	6	<i>Caretta caretta</i>	1
24-Apr-09	14:59	On	33.901816	-76.655485	6	<i>Caretta caretta</i>	1
24-Apr-09	15:33	On	33.955538	-76.848630	5	<i>Caretta caretta</i>	2
24-Apr-09	15:35	On	34.003770	-76.913145	5	<i>Caretta caretta</i>	1
24-Apr-09	15:35	On	34.004660	-76.914460	5	<i>Mola mola</i>	1
25-Apr-09	9:20	On	33.954420	-76.983899	4	Unid. Turtle	1
25-Apr-09	9:21	On	33.961913	-76.994609	4	<i>Mola mola</i>	1
25-Apr-09	9:21	On	33.967967	-77.003633	4	Unid. Turtle	1
25-Apr-09	10:12	On	33.813468	-77.070257	2	<i>Stenella frontalis</i>	16
25-Apr-09	10:30	On	33.758465	-77.116488	1	<i>Caretta caretta</i>	1
25-Apr-09	10:32	On	33.711090	-77.052273	1	Unid. Turtle	1

B. Shipboard surveys

Survey Effort

We had poor survey conditions for most of the month of April with high sea states restricting our vessel survey effort until late in the month. We completed four track lines: on April 24th we surveyed track line 8 aboard the R/V *Cetus*, and on April 27th, 28th, and 29th, we surveyed track lines 4, 2, and 5, respectively, aboard the F/V *Sensation*. We sighted spotted and bottlenose dolphins on all survey days, and 14 loggerhead sea turtles were sighted. Table 3 provides the details for these sightings and the locations of the sightings are presented in Figure 3.

We also conducted strip transect seabird counts concurrent with the marine mammal surveys. For the month of April 2009, 195 seabirds were observed during surveys and the total sightings per unit effort (SPUE), or the number of seabirds recorded per hour of effort, was 13.19 (see Table 4). Greater Shearwaters (*Puffinus gravis*) and Wilson's Storm Petrels (*Oceanites oceanicus*) were the most frequently sighted seabirds, while Pomarine Jaegers (*Stercorarius pomarinus*), Black-capped Petrels (*Pterodroma hasitata*), Audubon's Shearwaters (*Puffinus lherminieri*), Sooty Terns (*Onychoprion fuscatus*), Common Terns (*Sterna hirundo*), Parasitic Jaegers (*Stercorarius parasiticus*), Red Phalaropes (*Phalaropus fulcarius*), Bridled Terns (*Onychoprion anaethetus*), Black Terns (*Chlidonias niger*) and Manx Shearwaters (*Puffinus puffinus*) were also observed during April surveys.

Table 3. Sighting summary table for Duke vessel-based surveys.

Date	Track Line	Time	Lat	Long	Species	Group size	Effort
24-Apr-09	8	11:36:59	33.98393	-76.49637	<i>Stenella frontalis</i>	3	On
24-Apr-09	8	11:47:13	33.99286	-76.50544	<i>Caretta caretta</i>	1	On
24-Apr-09	8	11:49:59	33.99727	-76.51400	<i>Caretta caretta</i>	1	Off
24-Apr-09	8	11:56:19	34.01002	-76.52539	<i>Stenella frontalis</i>	3	Off
24-Apr-09	8	12:05:29	34.02530	-76.55198	<i>Caretta caretta</i>	1	On
24-Apr-09	8	12:07:45	34.03050	-76.55471	<i>Caretta caretta</i>	1	On
24-Apr-09	8	12:16:15	34.04537	-76.57454	<i>Caretta caretta</i>	1	On
24-Apr-09	8	13:10:23	34.13935	-76.70003	<i>Caretta caretta</i>	1	On
24-Apr-09	8	13:21:45	34.16796	-76.73723	<i>Stenella frontalis</i>	17	On
27-Apr-09	4	9:52:05	33.57901	-76.50598	<i>Tursiops truncatus</i>	6	On

27-Apr-09	4	12:29:31	33.82916	-76.79604	<i>Stenella frontalis</i>	26	Off
27-Apr-09	4	13:37:21	33.86750	-76.86637	<i>Caretta caretta</i>	1	On
27-Apr-09	4	13:43:17	33.87814	-76.88405	<i>Caretta caretta</i>	1	On
27-Apr-09	4	13:56:49	33.90387	-76.91938	<i>Caretta caretta</i>	1	On
27-Apr-09	4	14:20:54	33.95100	-76.98086	<i>Caretta caretta</i>	1	On
27-Apr-09	4	14:23:24	33.95564	-76.98579	<i>Caretta caretta</i>	1	On
27-Apr-09	4	14:26:18	33.96105	-76.99247	<i>Caretta caretta</i>	1	Off
27-Apr-09	4	14:27:52	33.96399	-76.99919	<i>Caretta caretta</i>	1	Off
27-Apr-09	4	14:29:38	33.96758	-77.00220	<i>Stenella frontalis</i>	5	On
28-Apr-09	2	11:30:20	33.63920	-76.84455	<i>Caretta caretta</i>	1	On
28-Apr-09	2	13:09:44	33.82581	-77.09264	<i>Tursiops truncatus</i>	3	On
28-Apr-09	2	13:49:58	33.82686	-77.08814	<i>Caretta caretta</i>	1	Off
28-Apr-09	2	13:52:04	33.83151	-77.08990	<i>Caretta caretta</i>	1	Off
28-Apr-09	2	13:59:58	33.84568	-77.10534	<i>Stenella frontalis</i>	3	Off
29-Apr-09	5	9:35:16	33.63931	-76.44773	<i>Tursiops truncatus</i>	13	On
29-Apr-09	5	11:33:00	33.79656	-76.64863	<i>Stenella frontalis</i>	12	Off
29-Apr-09	5	13:59:52	34.01311	-76.93772	<i>Stenella frontalis</i>	11	Off

Table 4. Seabird sightings by date during April, 2009 surveys in Onslow Bay.

Date	Apr-24-09	Apr-27-09	Apr-28-09	Apr-29-09	April Total
# Birds	16	26	60	93	195
Hours Effort	3:59	2:59	3:52	3:57	14:47:00
Total SPUE (all birds)	4.02	8.72	15.52	23.54	13.19
Audubon's Shearwaters (<i>Puffinus lherminieri</i>)	2	1	4		7
Greater Shearwaters (<i>Puffinus gravis</i>)			12	50	62
Manx Shearwaters (<i>Puffinus puffinus</i>)				1	1
Unidentified Shearwaters (<i>Puffinus</i> sp.)		1	2	3	6
Black-capped Petrels (<i>Pterodroma hasitata</i>)	7		4	2	13
Wilson's Storm Petrels (<i>Oceanites oceanicus</i>)		6	20	22	48
Unidentified Storm Petrels		3	1	2	6
Bridled Terns (<i>Onychoprion anaethetus</i>)		1	1		2
Sooty Terns (<i>Onychoprion fuscatus</i>)				5	5
Black Terns (<i>Chlidonias niger</i>)	2				2
Common Terns (<i>Sterna hirundo</i>)				4	4
Unidentified Terns		8			8
Parasitic Jaegers (<i>Stercorarius parasiticus</i>)			3		3
Pomarine Jaegers (<i>Stercorarius pomarinus</i>)		4	7	3	14
Unidentified Jaegers (<i>Stercorarius</i> sp.)		2	4		6
Red Phalaropes (<i>Phalaropus fulcarius</i>)	2				2
Unidentified Sandpipers (<i>Calidris</i> sp.)	3				3
Unidentified Birds			2	1	3

C. Passive Acoustics

After several months of windy weather, the High-frequency Acoustic Recording Package (HARP) was redeployed from the R/V Cape Fear on April 24th, near Track line 5, in approximately 570 ft of water (see Figure 4). The duration of this deployment will once again be for approximately four months, with the HARP employing a 50% duty cycle (recording every-other-five minutes) and 200 kHz sampling rate.

We deployed the towed array from the *F/V Sensation* on three days during April 2009. On April 27th, we deployed the hydrophone array for 5.7 hours of combined visual and acoustic survey. During this time, there were five acoustic detections that occurred between 09:10 – 09:13, 09:52 – 10:15, 10:51 – 11:10, 12:25 – 13:15, and 14:28 – 14:49. Three of these groups of animals were also visually detected; one was identified as *Tursiops truncatus* and the other two as *Stenella frontalis*. On April 28th, we deployed the hydrophone array for 5.3 hours of combined survey effort. During this time, we made three acoustic detections, one group of which the visual observers did not see (acoustically detected between 09:13 – 09:27) and one of which (a group of *Tursiops truncatus*) the visual observers saw first and turned the boat before anything was heard on the array (acoustically detected between 13:10 – 13:46). The third detection (occurring between 13:57 – 14:21) was a small group of *Stenella frontalis*, as confirmed by the visual observers. Finally, on April 29th, we deployed the array for 5.5 hours of combined visual and acoustic survey during which four acoustic detections were made. These acoustic detections occurred between 09:25 – 10:22, 11:31 – 12:00, 12:11 – 12:28, and 13:55 – 14:23. Three of these groups of animals were also visually detected; one was identified as *Tursiops truncatus* and two as *Stenella frontalis*.

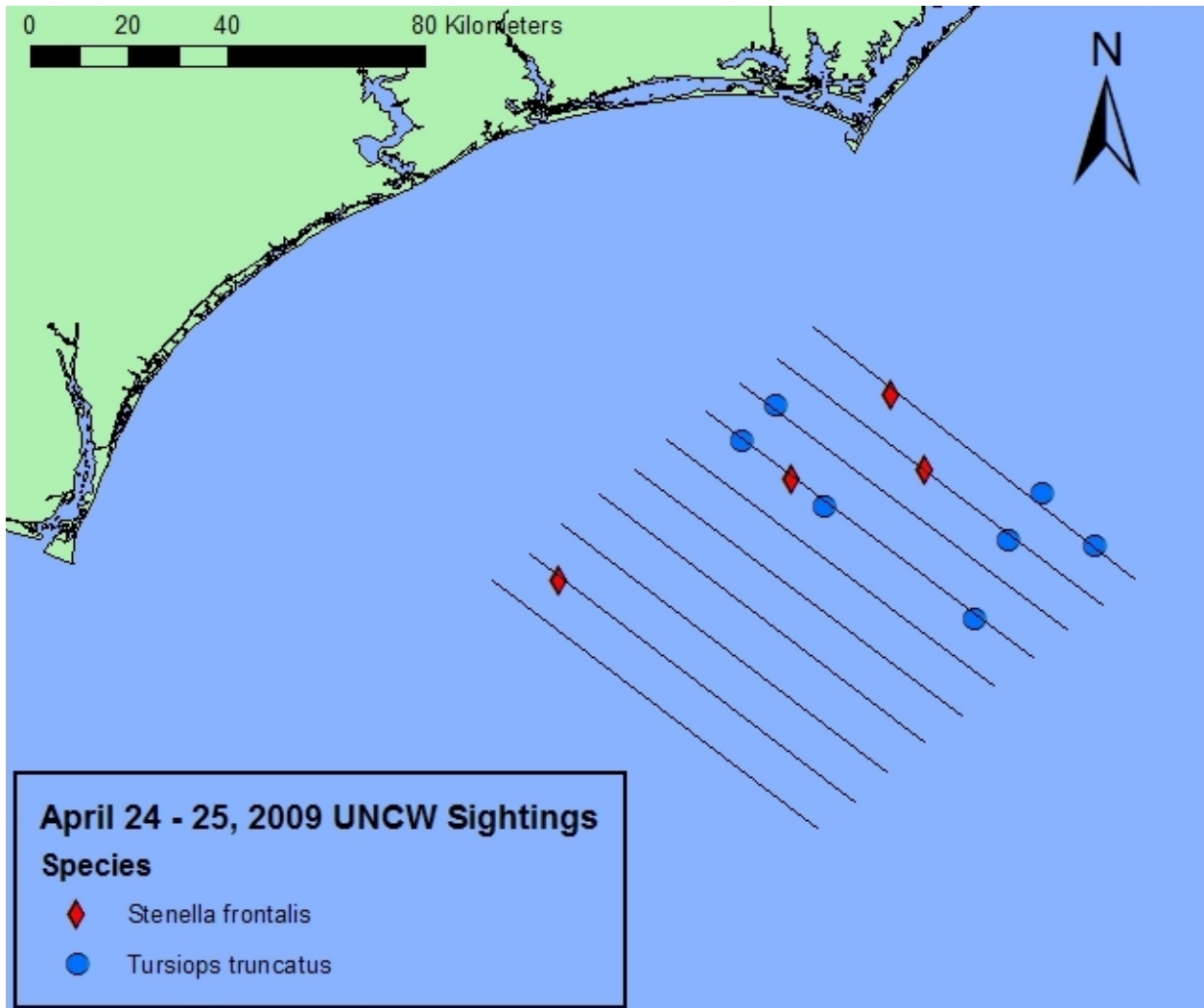


Figure 1. Location of cetacean sightings made during aerial surveys in April 2009. Refer to Tables 1 and 2.

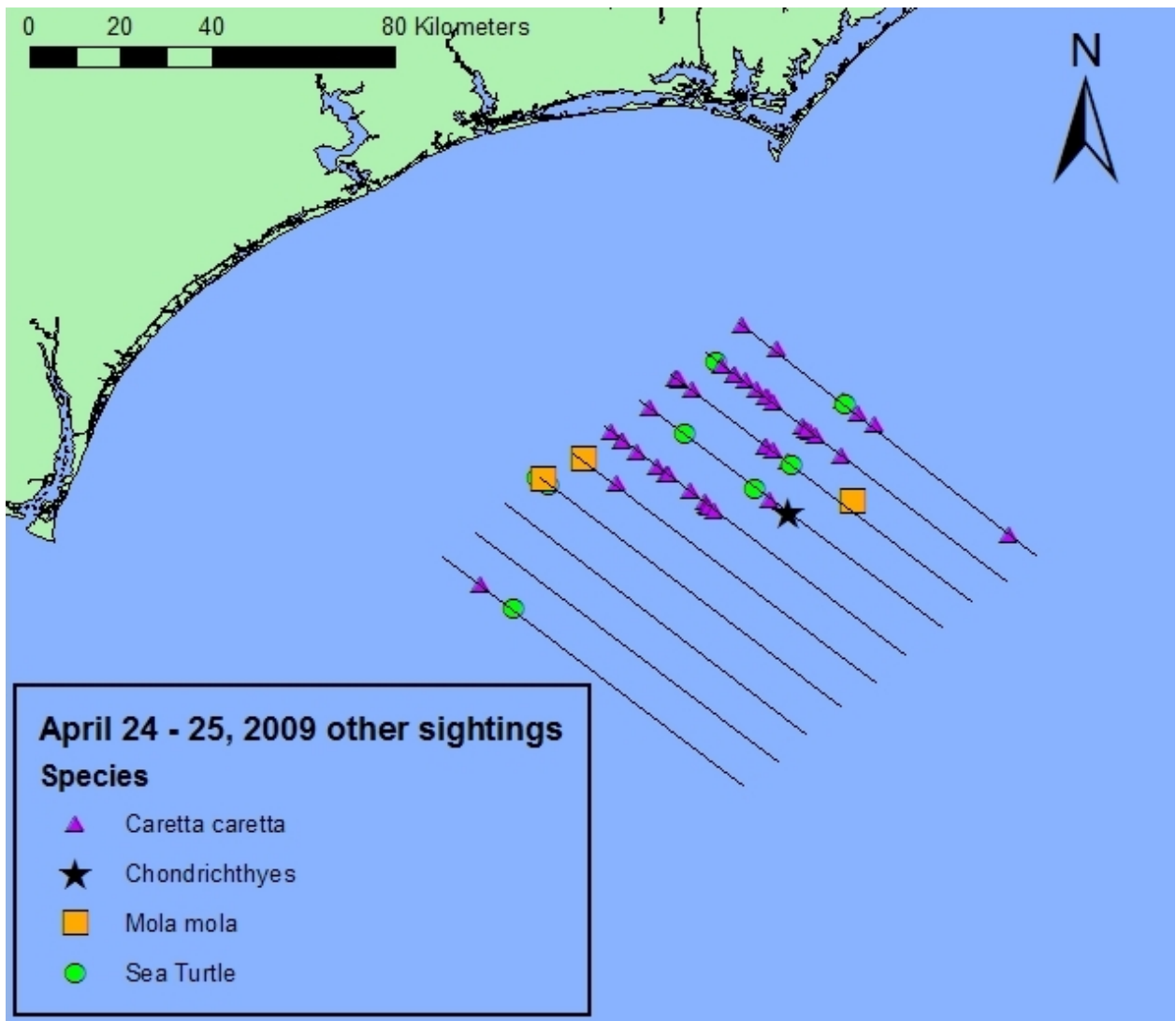


Figure 2. Location of sea turtle and fish sightings made during aerial surveys in April 2009. Refer to Tables 1 and 2.

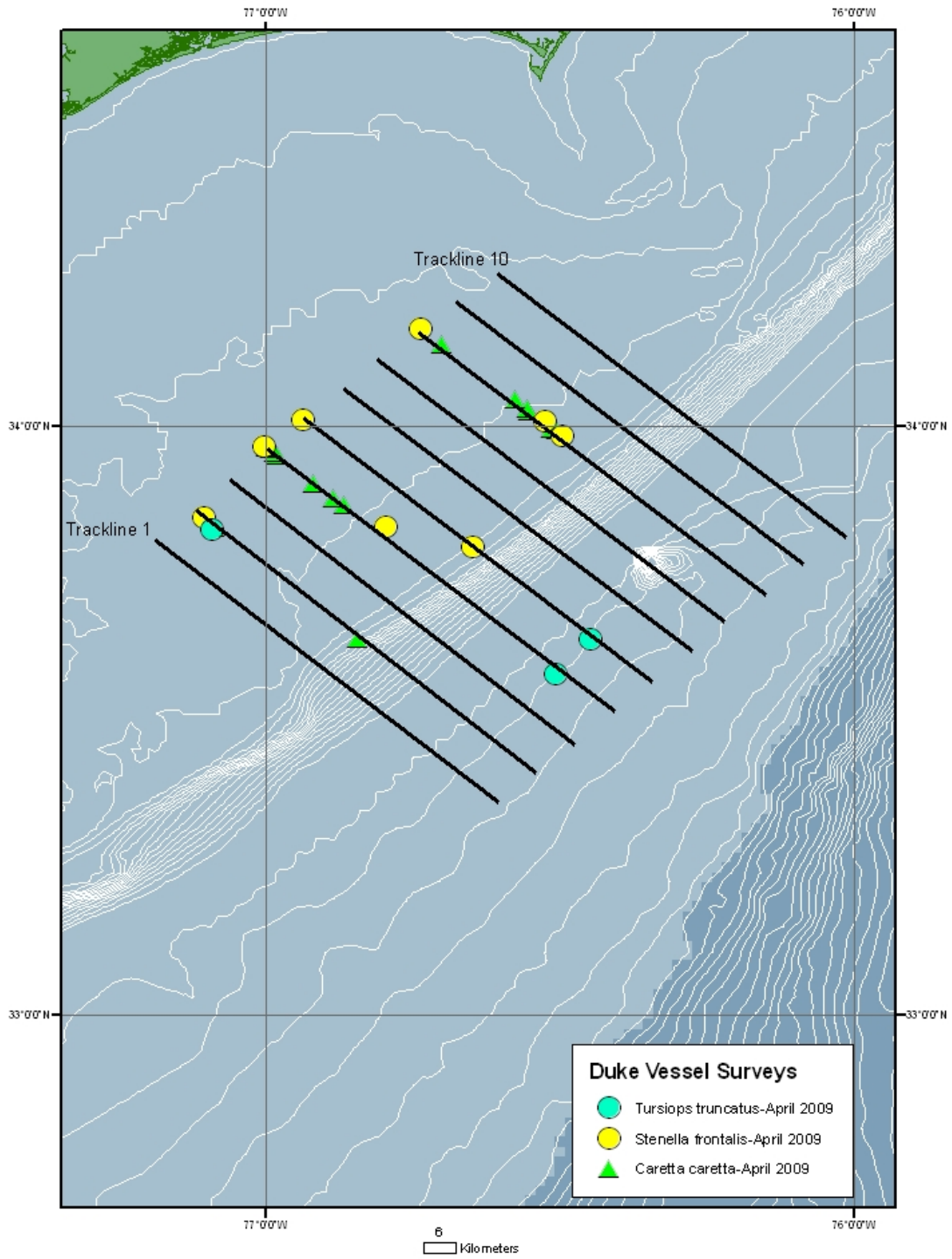


Figure 3. Location of sightings made during vessel surveys in April 2009. Refer to Table 3.

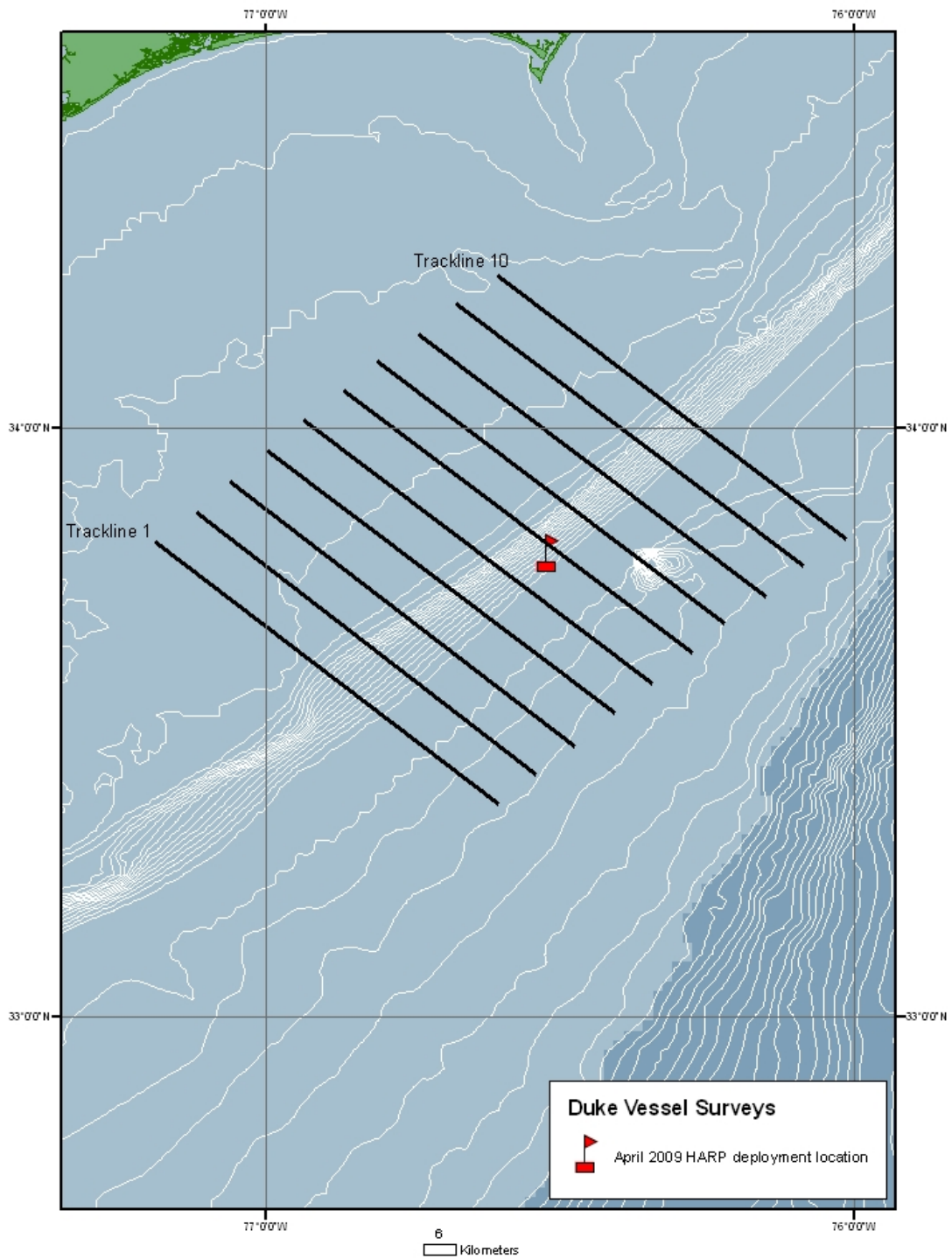


Figure 4. Location of HARP deployment, April 24th, 2009.

PROJECT STATUS REPORT

REPORT DATE:	June 1, 2009	REPORT PERIOD:	May 2009
BOA NO:	743586-60049	TASK ORDER:	746192-60007
GMI NUMBER:	30217.01.07	GMI PROJECT MGR:	Jason See
CLIENT NAME:	Parsons Infrastructure and Technology Group, Inc.	PARSONS MGR:	Stephen Buss
PROJECT NAME:	Marine protected species monitoring for the Proposed UnderSea Warfare Training Range (USWTR)		

1.0 WORK PERFORMED THIS REPORT PERIOD

The eastern seaboard of the US was again subjected to a number of weather systems during the month of May. This resulted in frequent high winds and unfavorable sea states in the study area that restricted our field effort. Despite these unfavorable conditions, the aerial surveys were conducted as planned.

A. Aerial Surveys

Survey Effort

The UNCW aerial survey team conducted surveys on May 12th, 28th, 30th and 31st, covering track lines 1 through 10 three times. Table 1 summarizes the track lines surveyed and sea state conditions and Table 2 summarizes the sightings made during these aerial surveys. The aerial survey team recorded bottlenose dolphins (*Tursiops truncatus*), spotted dolphins (*Stenella frontalis*), loggerhead turtles (*Caretta caretta*), a hammerhead shark (*Sphyrna sp*) and a great white shark, (*Carcharodon carcharias*), this month, as well as sightings of unidentified dolphins and sea turtles. Figures 1 and 2 show the locations of the observations made on the aerial surveys.

Table 1. Effort summary table for UNCW aerial surveys.

Date	Line	Sea State	Kilometers flown
12-May-09	1	3 to 4	74.1
12-May-09	2	3 to 4	73.7
12-May-09	3	3 to 4	74.5
12-May-09	4	3 to 4	75.0
12-May-09	5	3 to 4	74.6
12-May-09	6	3 to 4	72.0
28-May-09	1	1 to 3	68.6
28-May-09	2	1 to 3	73.2
28-May-09	3	2	72.8
28-May-09	4	1 to 2	68.6
28-May-09	5	1 to 3	73.5
28-May-09	6	1 to 3	71.6
28-May-09	7	2 to 3	72.9
28-May-09	8	2 to 3	74.7
30-May-09	10	1 to 2	74.8

30-May-09	9	1 to 2	71.5
30-May-09	8	1 to 2	75.3
30-May-09	7	1	72.8
30-May-09	6	1	74.2
30-May-09	5	1 to 2	75.9
31-May-09	10	1 to 2	73.7
31-May-09	9	1 to 2	72.8
31-May-09	8	1 to 2	72.2
31-May-09	7	1 to 2	74.0
31-May-09	4	1 to 2	74.1
31-May-09	3	1 to 2	74.3
31-May-09	1	2 to 4	73.9
31-May-09	2	2 to 3	74.0
31-May-09	9	2 to 4	72.8
31-May-09	10	2 to 3	72.1

Table 2. Sighting summary table for UNCW aerial surveys.

Date	Time	Effort	Latitude	Longitude	Track	Species	Group Size
12-May-09	9:52	On	33.940350	-76.966487	4	<i>Caretta caretta</i>	1
12-May-09	11:40	On	33.803048	-77.166464	1	Unid. Delphinid	26
28-May-09	9:38	On	33.448227	-76.724387	1	<i>Tursiops truncatus</i>	60
28-May-09	10:04	On	33.631837	-76.822565	2	<i>Manta birostris</i>	1
28-May-09	11:00	On	33.811291	-76.804148	4	<i>Stenella frontalis</i>	25
28-May-09	11:12	On	33.962867	-76.995137	4	<i>Manta birostris</i>	1
28-May-09	13:40	On	33.627112	-76.416079	5	<i>Tursiops truncatus</i>	40
28-May-09	14:00	On	33.690512	-76.386340	6	<i>Tursiops truncatus</i>	35
28-May-09	14:43	On	33.756924	-76.335357	7	<i>Tursiops truncatus</i>	10
30-May-09	13:32	On	33.824461	-76.152444	9	<i>Caretta caretta</i>	1
30-May-09	13:43	On	34.049953	-76.451432	9	<i>Sphyrna sp</i>	1
30-May-09	13:45	On	34.082491	-76.493980	9	<i>Caretta caretta</i>	1
30-May-09	13:49	On	34.170325	-76.608701	9	<i>Caretta caretta</i>	1
30-May-09	14:00	On	34.020507	-76.537506	8	<i>Caretta caretta</i>	1
30-May-09	14:27	On	33.699538	-76.255246	10	<i>Carcharodon carcharias</i>	1
30-May-09	14:29	On	33.711527	-76.255299	7	<i>Tursiops truncatus</i>	4
30-May-09	14:56	On	33.961199	-76.585128	7	<i>Caretta caretta</i>	1
30-May-09	15:01	On	34.069648	-76.735551	7	<i>Caretta caretta</i>	1
30-May-09	15:10	On	34.075319	-76.745905	7	Unid. Delphinid	1
30-May-09	15:24	On	34.043226	-76.842363	6	Unid. Turtle	1
30-May-09	15:27	On	33.983569	-76.758342	6	<i>Caretta caretta</i>	1
30-May-09	15:31	On	33.887193	-76.634280	6	Unid. Turtle	1
30-May-09	15:36	On	33.885123	-76.611188	6	<i>Tursiops truncatus</i>	3
30-May-09	15:47	On	33.766050	-76.476238	6	<i>Caretta caretta</i>	1
30-May-09	16:04	On	33.707423	-76.532603	5	<i>Caretta caretta</i>	1
30-May-09	16:08	On	33.796473	-76.643934	5	<i>Caretta caretta</i>	1

30-May-09	16:11	On	33.867255	-76.736276	5	<i>Caretta caretta</i>	1
31-May-09	9:30	On	34.101090	-76.524424	9	<i>Caretta caretta</i>	1
31-May-09	9:32	On	34.147939	-76.593653	9	<i>Caretta caretta</i>	1
31-May-09	9:42	On	34.072924	-76.609366	8	<i>Sphyrna sp</i>	1
31-May-09	9:47	On	33.984991	-76.505104	8	<i>Tursiops truncatus</i>	10
31-May-09	10:34	On	33.800216	-76.383575	7	Unidentified shark	1
31-May-09	10:48	On	34.104630	-76.784743	7	<i>Manta birostris</i>	1
31-May-09	11:08	On	33.694609	-76.657794	4	<i>Tursiops truncatus</i>	10
31-May-09	11:51	On	33.601105	-76.536491	4	<i>Tursiops truncatus</i>	20
31-May-09	12:10	On	33.776648	-76.880422	3	<i>Caretta caretta</i>	1

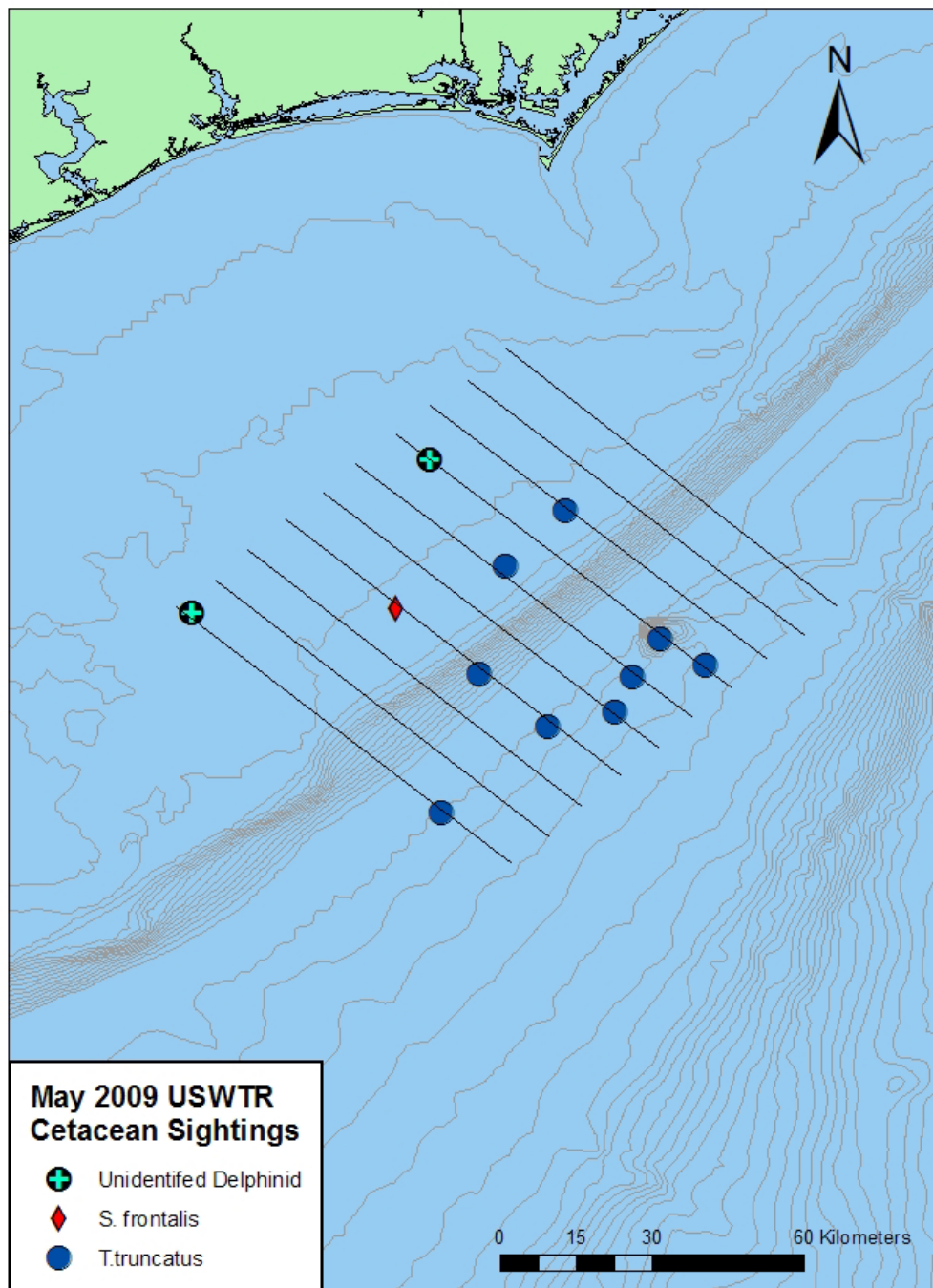


Figure 1. Location of cetacean sightings made during aerial surveys in May 2009. Refer to Tables 1 and 2.

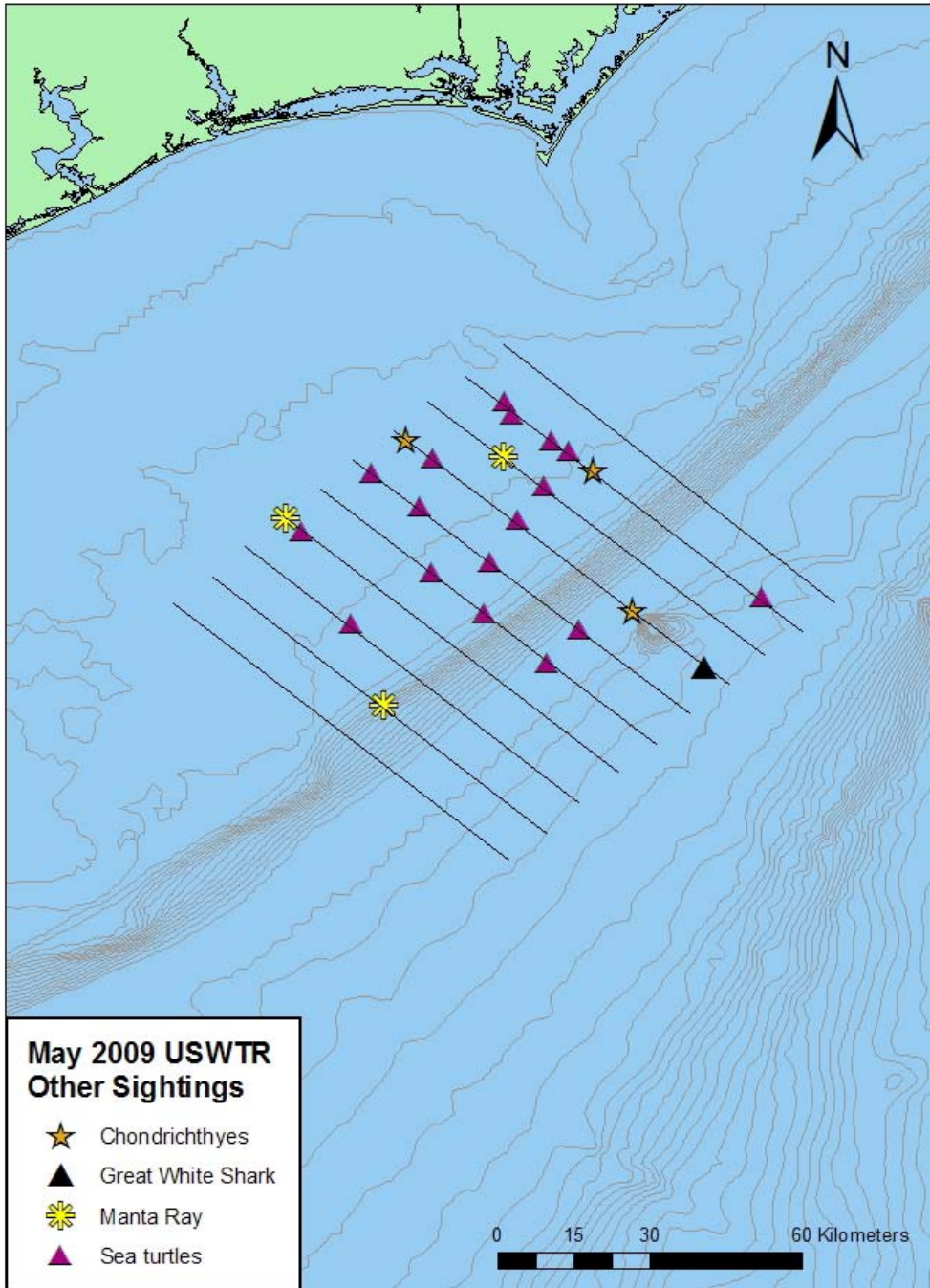


Figure 2. Location of sea turtle and fish sightings made during aerial surveys in May 2009. Refer to Tables 1 and 2.

B. Shipboard surveys

Survey Effort

We had poor survey conditions for the month of May with high sea states restricting our vessel survey effort.

C. Passive Acoustics

The High Frequency Recording Package (HARP) was deployed on April 24th near track line 5. The duration of this deployment will once again be for approximately four months, with the HARP employing a 50% duty cycle (recording every-other-five minutes) and 200 kHz sampling rate.

PROJECT STATUS REPORT

REPORT DATE:	1 July 2009	REPORT PERIOD:	June 2009
BOA NO:	743586-60049	TASK ORDER:	746192-60007
GMI NUMBER:	30217.01.07	GMI PROJECT MGR:	Jason See
CLIENT NAME:	Parsons Infrastructure and Technology Group, Inc.	PARSONS MGR:	Stephen Buss
PROJECT NAME:	Marine protected species monitoring for the Proposed UnderSea Warfare Training Range (USWTR)		

1.0 WORK PERFORMED THIS REPORT PERIOD

The eastern seaboard of the US was again subjected to a number of weather systems during most of the month of June. This resulted in frequent high winds and unfavorable sea states in the study area that restricted our field effort. Despite these unfavorable conditions, both aerial and vessel-based surveys were conducted as planned.

A. Aerial Surveys

Survey Effort

The UNCW aerial survey team conducted observations on June 1st and 2nd; covering track lines 1 through 10 twice. Table 1 summarizes the track lines surveyed and sea state conditions, and Table 2 summarizes the sightings made during these aerial surveys. This month the aerial survey team recorded spotted dolphins (*Stenella frontalis*), large groups of bottlenose dolphins (*Tursiops truncatus*), loggerhead turtles (*Caretta caretta*), a leatherback turtle (*Dermochelys coriacea*), an ocean sunfish (*Mola mola*), several manta ray (*Manta birostris*), and unidentified turtles, dolphins, and fish. Figure 1 shows the locations of the observations made on the aerial surveys.

Table 1. Effort summary table for UNCW aerial surveys.

Date	Line	Sea State	Kilometers flown
1-Jun-09	1	1-2	68.8
1-Jun-09	2	1-2	72.0
1-Jun-09	3	1-2	75.0
1-Jun-09	4	1-2	74.7
1-Jun-09	5	1-2	74.4
1-Jun-09	6	1-2	73.1
1-Jun-09	7	1-2	73.8
1-Jun-09	8	1-2	72.5
1-Jun-09	9	1-2	72.5
1-Jun-09	10	2	70.3
2-Jun-09	1	1	74.1
2-Jun-09	2	1	70.1
2-Jun-09	3	1	74.7
2-Jun-09	4	1	74.7
2-Jun-09	5	1-2	70.8
2-Jun-09	6	1-2	74.6
2-Jun-09	7	1-3	78.3

2-Jun-09	8	1-3	76.3
2-Jun-09	9	1-3	73.2
2-Jun-09	10	1-3	75.1

Table 2. Sighting summary table for UNCW aerial surveys.

Date	Time	Effort	Latitude	Longitude	Track	Species	Group Size
1-Jun-09	10:05	On	33.821909	-76.687991	5	<i>Tursiops truncatus</i>	3
1-Jun-09	10:36	On	33.773081	-76.476520	6	<i>Caretta caretta</i>	1
1-Jun-09	10:55	Off	34.052427	-76.730425	7	<i>Mola mola</i>	1
1-Jun-09	10:57	Off	34.064991	-76.73628	7	<i>Stenella frontalis</i>	3
1-Jun-09	11:05	On	34.053559	-76.718352	7	<i>Stenella frontalis</i>	6
1-Jun-09	11:42	On	33.964068	-76.450177	8	<i>Tursiops truncatus</i>	2
1-Jun-09	11:52	On	34.086870	-76.629366	8	<i>Caretta caretta</i>	1
1-Jun-09	11:55	On	34.155358	-76.718417	8	Unid. Turtle	1
1-Jun-09	12:05	On	34.056448	-76.466167	9	Unid. Turtle	1
1-Jun-09	12:27	On	33.927627	-76.170854	8	<i>Tursiops truncatus</i>	28
1-Jun-09	12:42	On	34.118759	-76.411411	10	<i>Caretta caretta</i>	1
1-Jun-09	12:44	On	34.171457	-76.471264	10	<i>Caretta caretta</i>	1
1-Jun-09	12:48	On	34.228561	-76.544918	10	<i>Dermochelys coriacea</i>	1
1-Jun-09	14:56	On	33.882602	-76.887040	4	<i>Manta birostris</i>	1
1-Jun-09	15:33	On	33.817667	-76.942687	3	Unid. Fish	1
1-Jun-09	15:47	On	33.767246	-76.990013	2	<i>Stenella frontalis</i>	13
1-Jun-09	16:42	On	33.437666	-76.695101	1	<i>Tursiops truncatus</i>	35
1-Jun-09	17:15	On	33.66503	-76.986169	1	Unid. Dephinid	11
2-Jun-09	9:43	On	33.824363	-76.702676	5	<i>Tursiops truncatus</i>	8
2-Jun-09	10:26	On	33.685348	-76.629302	4	<i>Chondrichthyes</i>	1
2-Jun-09	10:55	On	33.902160	-77.050108	3	<i>Caretta caretta</i>	1
2-Jun-09	11:03	On	33.790918	-77.046095	2	<i>Stenella frontalis</i>	5
2-Jun-09	11:36	On	33.473489	-76.633977	2	<i>Tursiops truncatus</i>	25
2-Jun-09	14:24	On	33.844391	-76.188814	9	Unid. Turtle	1
2-Jun-09	14:32	On	34.030103	-76.429515	9	Unid. Turtle	1
2-Jun-09	14:55	On	33.920512	-76.407837	8	<i>Manta birostris</i>	1

B. Shipboard surveys

Survey Effort

Unusually high winds in June limited vessel survey effort to only four days and 16 hours of effort. On June 1st we surveyed track line 3 aboard the F/V Sensation but only finished 1/3 of the track due to deteriorating weather conditions. In the remainder of the month we completed three track lines: on June 2nd and 24th we surveyed track lines 10 and 9 respectively, aboard the R/V Cetus, and on June 23rd we surveyed track line 6 aboard the F/V Sensation. We sighted bottlenose dolphins on June 1st, and sighted spotted dolphins and loggerhead sea turtles on the 2nd and 24th. There were no sightings on June 23rd. Table 3 provides the details for these sightings and the locations of the sightings are presented in Figure 2.

We also conducted strip transect seabird counts concurrent with the marine mammal surveys. For the month of June, 2009, 14 seabirds were observed during 1.12 hours of survey effort and the total sightings per unit effort (SPUE), or the number of seabirds recorded per hour of effort, was 12.54. Black Terns (*Chlidonias niger*), Audubon's Shearwaters (*Puffinus lherminieri*) and Cory's Shearwaters (*Calonectris diomedea*) were the most frequently sighted birds, while Manx Shearwaters (*Puffinus puffinus*), Leach's Storm Petrels (*Oceanodroma leucorhoa*) and Wilson's Storm Petrels (*Oceanites oceanicus*) were also observed during June surveys.

Table 3. Sighting summary table for Duke vessel-based surveys.

Date	Track Line	Time	Latitude	Longitude	Species	Group Size	Effort
01-Jun-09	3	10:35:37	33.6009124	-76.659381	<i>Tursiops truncatus</i>	4	On
01-Jun-09	3	11:09:07	33.6066388	-76.6703311	<i>Tursiops truncatus</i>	3	Off
01-Jun-09	3	11:34:46	33.6475075	-76.722289	<i>Tursiops truncatus</i>	8	On
02-Jun-09	10	12:41:36	34.0709853	-76.3416559	<i>Caretta caretta</i>	1	On
02-Jun-09	10	12:47:30	34.0814751	-76.3540631	<i>Stenella frontalis</i>	27	On
02-Jun-09	10	14:37:14	34.1763728	-76.4899044	<i>Caretta caretta</i>	1	On
24-Jun-09	9	13:47:47	34.1703752	-76.6134457	<i>Stenella frontalis</i>	26	On
24-Jun-09	9	14:40:55	34.2197125	-76.6710766	<i>Caretta caretta</i>	1	On

Table 4: Seabird sightings by date during June, 2009 surveys in Onslow Bay

Date	Jun 2009
# Birds	14
Hours Effort	1.12
Total SPUE (all birds)	12.54
Audubon's Shearwaters (<i>Puffinus lherminieri</i>)	3
Cory's Shearwaters (<i>Calonectris diomedea</i>)	2
Manx Shearwaters (<i>Puffinus puffinus</i>)	1
Unidentified Shearwaters (<i>Puffinus</i> sp.)	1
Leach's Storm Petrels (<i>Oceanodroma leucorhoa</i>)	1
Wilson's Storm Petrels (<i>Oceanites oceanicus</i>)	1
Unidentified Storm Petrels	1
Black Terns (<i>Chlidonias niger</i>)	4
TOTAL	14

C. Passive Acoustics

We deployed the towed array on four days during June 2009. On June 1st, we deployed the hydrophone array from the *F/V Sensation* for 4.75 hours of combined visual and acoustic survey. During this time, two groups of *Tursiops truncatus* were both visually and acoustically detected. On June 2nd, we deployed the hydrophone array from the *R/V Cetus* for 4.9 hours of combined visual and acoustic survey. During this time, there were three acoustic detections. Only the last acoustic detection was also visually detected; the group was identified as *Stenella frontalis*. On June 23rd, we deployed the hydrophone array from the *F/V Sensation* for 2.6 hours of acoustic survey, one hour of which was combined with visual survey effort. During this time, there were two acoustic detections. Despite efforts to visually observe the first group using

acoustic localization techniques, the weather was not favorable enough (due to high Beaufort sea state and rain) for a visual detection. The second detection consisted of two brief sets of high frequency clicks. These same clicks have been seen in the HARP data and may possibly be from a boat's depth sounder. Finally, on June 24th, we deployed the hydrophone array from the *R/V Cetus* for 4.25 hours of acoustic survey, 3.9 hours of which was combined with visual survey effort. During this time, there were four acoustic detections, only the last of which was also detected visually. The first detection consisted of *Physeter macrocephalus* clicks. The last acoustic detection was confirmed by the visual observers to be sounds made by *Stenella frontalis*.

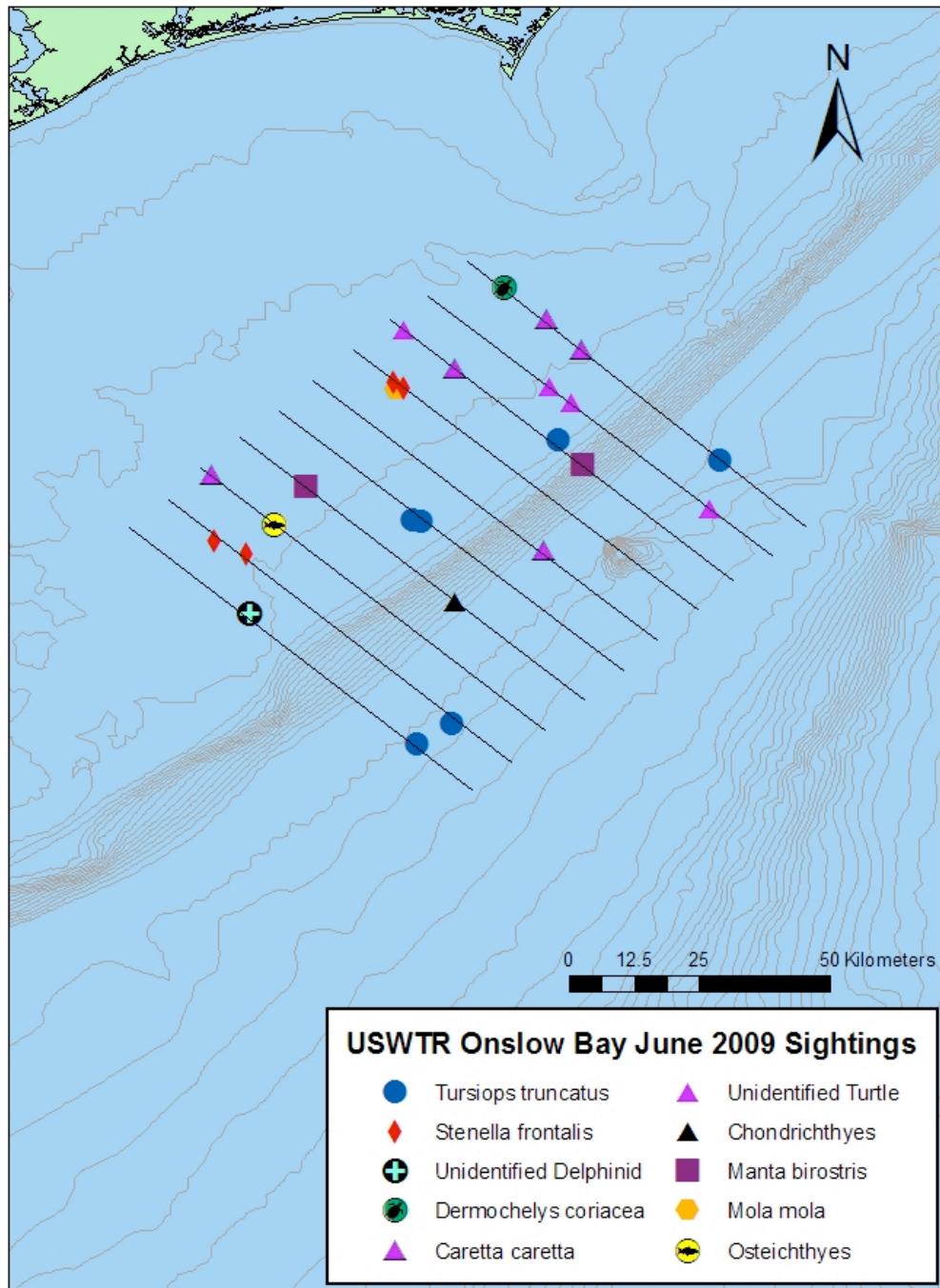


Figure 1. Location of cetacean, sea turtle and other species sightings made during aerial surveys in June 2009. Refer to Tables 1 and 2.

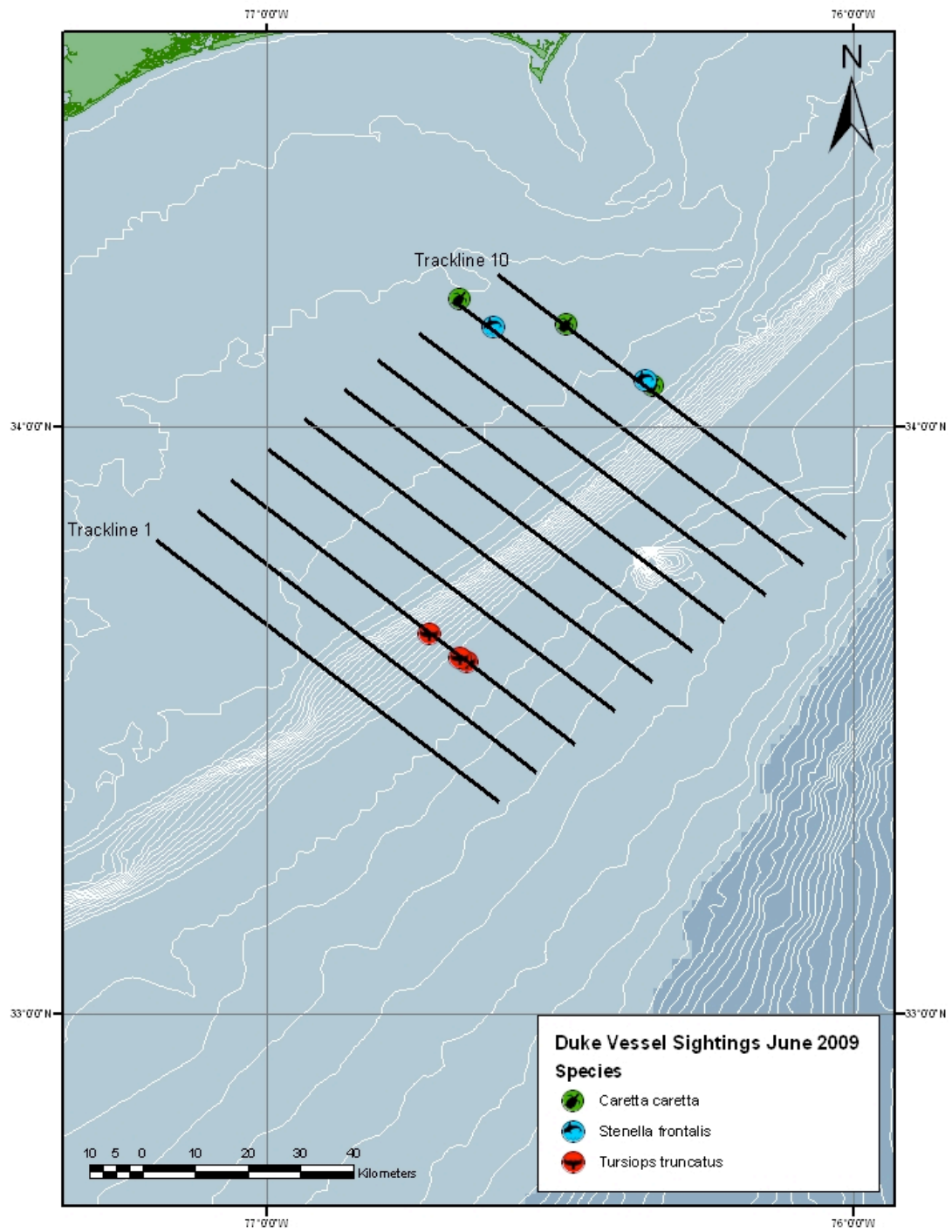


Figure 2. Location of sightings made during vessel surveys in June 2009. Refer to Table 3.

PROJECT STATUS REPORT

REPORT DATE:	1 August 2009	REPORT PERIOD:	July 2009
BOA NO:	743586-60049	TASK ORDER:	746192-60007
GMI NUMBER:	30217.01.07	GMI PROJECT MGR:	Jason See
CLIENT NAME:	Parsons Infrastructure and Technology Group, Inc.	PARSONS MGR:	Stephen Buss
PROJECT NAME:	Marine protected species monitoring for the Proposed UnderSea Warfare Training Range (USWTR)		

1.0 WORK PERFORMED THIS REPORT PERIOD

During the month of July both shipboard and aerial surveys were conducted in Onslow Bay. While the aerial team surveyed all track lines twice, the shipboard team surveyed only two days in Onslow Bay due to unusually strong winds out of the South for this time of year. The shipboard survey team also conducted surveys in an area off Cape Hatteras, NC where marine mammal density is known to be higher in an effort to acquire more sighting data and improve the probability detection function being used to calculate marine mammal densities in Onslow Bay.

A. Aerial Surveys

Survey Effort

The UNCW aerial survey team conducted observations on July 8th, 27th and 28th; covering track lines 1 through 10 twice. Table 1 summarizes the track lines surveyed and sea state conditions, and Table 2 summarizes the sightings made during these aerial surveys. The aerial survey team did not record any cetacean sightings this month, but did observe loggerhead turtles on the 8th and 28th. Figure 1 shows the locations of the sightings made during the aerial surveys.

Table 1. Effort summary table for UNCW aerial surveys.

Date Line	Sea State	Kilometers flown
8-Jul-09 5	2-3	74.5
8-Jul-09 6	2-3	74.2
8-Jul-09 7	2-3	74.4
8-Jul-09 8	2-3	75.0
8-Jul-09 9	2-3	73.0
8-Jul-09 10	2-3	74.2
27-Jul-09 1	3-4	74.4
27-Jul-09 2	3-4	74.3
27-Jul-09 3	3-4	74.5
27-Jul-09 4	3-4	74.9
27-Jul-09 7	3-4	74.5
27-Jul-09 8	3-4	74.7
27-Jul-09 9	3-4	73.2
27-Jul-09 10	3-4	74.2
28-Jul-09 1	3-4	74.7
28-Jul-09 2	3-4	73.7
28-Jul-09 3	3-4	74.9

28-Jul-09 4		3-4	74.0
28-Jul-09 5		2-4	74.3
28-Jul-09 6		3-4	74.6

Table 2. Sighting summary table for UNCW aerial surveys.

Date	Time	Effort	Latitude	Longitude	Track	Species	Group Size
8-Jul-09	15:41	On 34.235	277	-76.562036	10	<i>Caretta caretta</i>	1
8-Jul-09	13:53	On 33.878	084	-76.623097	6	<i>Caretta caretta</i>	1
8-Jul-09	14:57	On 34.195	802	-76.656175	9	<i>Caretta caretta</i>	2
8-Jul-09	14:58	On 34.183	342	-76.634894	9	<i>Unid. Turtle</i>	2
8-Jul-09	15:03	On 34.071	089	-76.484849	9	<i>Caretta caretta</i>	1
28-Jul-09	10:51	On 33.660	413	-76.864951	2	<i>Caretta caretta</i>	1

B. Shipboard surveys

Survey Effort

Shipboard surveys in Onslow bay occurred on July 11th and 16th for a total of 9 hours of effort. On July 11th we surveyed track line 8 aboard the R/V *Cetus* and had two delphinid sightings. On July 16th we surveyed track line 7 aboard the R/V *Cetus*, and had zero sightings. Table 3 provides the details for these sightings and the locations of the sightings are presented in Figure 2.

We conducted strip transect seabird counts concurrent with the marine mammal surveys. For the month of July 2009, 4 seabirds were observed during 3.72 hours of survey effort and the total sightings per unit effort (SPUE), or the number of seabirds recorded per hour of effort, was 1.08. Audubon's Shearwaters (*Puffinus lherminieri*), Cory's Shearwaters (*Calonectris diomedea*) and Greater Shearwaters (*Puffinus gravis*) were observed during July surveys. Table 4 provides the details for these sightings.

During this month we also conducted shipboard surveys along the continental shelf break slightly north of Hatteras, NC. The objective of these surveys was to improve the probability detection functions being used to calculate marine mammal densities in Onslow Bay; this requires a higher sample number of sightings than we have observed to date in Onslow Bay. Based on previous research, this area is known to have a high density of marine mammals, and using modified tracklines that repeatedly crossed the shelf break, we recorded 34 cetacean sightings and 2 turtle sightings during four days of survey effort. Surveys were conducted from the F/V *Sensation* on July 20th, 21st, 22nd and 25th for a total of 26.5 survey hours, and 15.5 hours on effort. Table 5 provides the details for these sightings and the locations of the sightings are presented in Figure 3.

Table 3: Sighting summary table for Duke vessel-based surveys.

Date	Trackline	Time	Latitude	Longitude	Species	Group Size	Effort
11-Jul-09	8	10:35:26	33.90316323	-76.39170825	Unid. Delphinid	unknown	On
11-Jul-09	8	12:51:58	34.1146024	-76.67675288	<i>Tursiops truncatus</i>	6	On

Table 4: Seabird sightings by date during June 2009 surveys in Onslow Bay

Date	July 16, 2009
# Birds	4
Hours Effort	3.72
Total SPUE (all birds)	1.08
Audubon's Shearwaters (<i>Puffinus lherminieri</i>)	1
Cory's Shearwaters (<i>Calonectris diomedea</i>)	2
Greater Shearwaters (<i>Puffinus gravis</i>)	1
TOTAL	4

Table 5: Sighting summary table for Duke vessel-based surveys off Oregon Inlet, NC.

Date	Sighting Number	Time	Latitude	Longitude	Species	Group Size	Effort
20-Jul-09	1	8:18:13	35.34740319	-74.96973864	<i>Tursiops truncatus</i>	15	On
20-Jul-09	2	8:54:06	35.36296376	-74.93899245	<i>Tursiops truncatus</i>	25	On
20-Jul-09	3	9:51:16	35.38838449	-74.85688843	<i>Tursiops truncatus</i>	3	On
20-Jul-09	4	9:55:12	35.40152222	-74.87767471	<i>Tursiops truncatus</i>	5	Off
20-Jul-09	5	10:12:02	35.40897684	-74.8829111	<i>Tursiops truncatus</i>	59	Off
20-Jul-09	6	10:42:39	35.39207729	-74.85753704	<i>Tursiops truncatus</i>	79	On
20-Jul-09	7	11:20:27	35.39908695	-74.83059551	<i>Tursiops truncatus</i>	10	On
20-Jul-09	8	11:47:05	35.43255596	-74.79023802	<i>Tursiops truncatus</i>	25	On
20-Jul-09	9	12:33:17	35.43896409	-74.81708473	<i>Tursiops truncatus</i>	25	On
20-Jul-09	10	13:21:11	35.50789809	-74.84042784	<i>Tursiops truncatus</i>	8	On
20-Jul-09	11	13:56:03	35.54811122	-74.8619997	<i>Tursiops truncatus</i>	5	On
20-Jul-09	12	15:55:48	35.64252874	-74.82173783	<i>Tursiops truncatus</i>	8	On
21-Jul-09	1	9:21:12	35.64262689	-74.78551961	Globicephala sp.	21	Off
21-Jul-09	2	10:04:40	35.64090513	-74.76861453	Globicephala sp.	18	On
21-Jul-09	3	10:37:01	35.63648359	-74.75803397	Globicephala sp.	13	On
22-Jul-09	1	8:37:48	35.54461122	-74.81536045	<i>Tursiops truncatus</i>	10	Off
22-Jul-09	2	8:56:22	35.530428	-74.83698276	<i>Tursiops truncatus</i>	90	Off
22-Jul-09	3	9:25:42	35.53902062	-74.80714751	<i>Tursiops truncatus</i>	10	On
22-Jul-09	4	9:44:50	35.53399654	-74.78936907	Unid. Delphinid	2	On
22-Jul-09	5	10:07:20	35.50248398	-74.78009285	<i>Tursiops truncatus</i>	10	On
22-Jul-09	6	12:01:35	35.41046501	-74.88544163	<i>Tursiops truncatus</i>	8	On
22-Jul-09	7	12:51:43	35.37671433	-74.88624725	<i>Tursiops truncatus</i>	4	On
22-Jul-09	8	13:14:07	35.35234204	-74.84837072	<i>Tursiops truncatus</i>	11	On
22-Jul-09	9	13:49:23	35.33284113	-74.86345729	<i>Tursiops truncatus</i>	18	On
22-Jul-09	10	14:05:03	35.34815694	-74.85935321	<i>Tursiops truncatus</i>	8	On
22-Jul-09	11	14:24:21	35.36433351	-74.85646104	<i>Tursiops truncatus</i>	4	On
25-Jul-09	1	8:33:00	35.3460944	-74.99755876	<i>Caretta caretta</i>	1	On
25-Jul-09	2	9:16:22	35.38101709	-74.87445079	Globicephala sp.	58	On
25-Jul-09	3	9:42:08	35.3969819	-74.84974191	<i>Tursiops truncatus</i>	57	On
25-Jul-09	4	11:00:28	35.66471479	-74.81842418	Globicephala sp.	28	On
25-Jul-09	5	11:29:06	35.68012065	-74.7993179	Globicephala sp.	40	On
25-Jul-09	6	12:11:12	35.71191493	-74.78017017	<i>Caretta caretta</i>	1	On

25-Jul-09 7		12:33:00	35.73610959	-74.82361308	Globicephala sp.	11	On
25-Jul-09 8		14:24:14	35.8032466	-74.850855	Globicephala sp.	14	On
25-Jul-09 9		14:54:08	35.81241015	-74.81859586	Globicephala sp.	10	On
25-Jul-09 10		15:15:28	35.81822427	-74.79682145	<i>Grampus griseus</i>	34	On

C. Passive Acoustics

We deployed the towed array on two days during July 2009. On July 11th, we deployed the hydrophone array from the *R/V Cetus* for 4.95 hours of combined visual and acoustic survey. During this time, there were three acoustic detections, two of which were also visually detected. One of these detections was confirmed as a group of *Tursiops truncatus*, while the other group was unidentified. On July 16th, we deployed the hydrophone array from the *R/V Cetus* for 4.9 hours of combined visual and acoustic survey. During this time, there were two acoustic detections, but neither was visually detected.

Also during July 2009, we deployed the hydrophone array for four days (July 20th, 21st, 22nd and 25th) while surveying offshore of Hatteras, NC. During these days, we deployed the hydrophone array from the *F/V Sensation* for 16.2 hours of combined visual and acoustic survey and made recordings of 12 groups of *Tursiops truncatus*, five groups of *Globicephala spp.* (one of which also included *Tursiops truncatus*), and one mixed group of *Grampus griseus* and *Tursiops truncatus*.

D. Oceanographic Sampling

One day of oceanographic sampling was conducted in July 2009. Surveys using an acoustic Doppler current profiler (ADCP) and a 38 kHz fisheries acoustics transducer were used to examine physical regimes and distributions of marine mammal and seabird prey at depth. Surveys were conducted across the Gulf Stream front on July 8, 2009 during an onshore meander of the Gulf Stream.

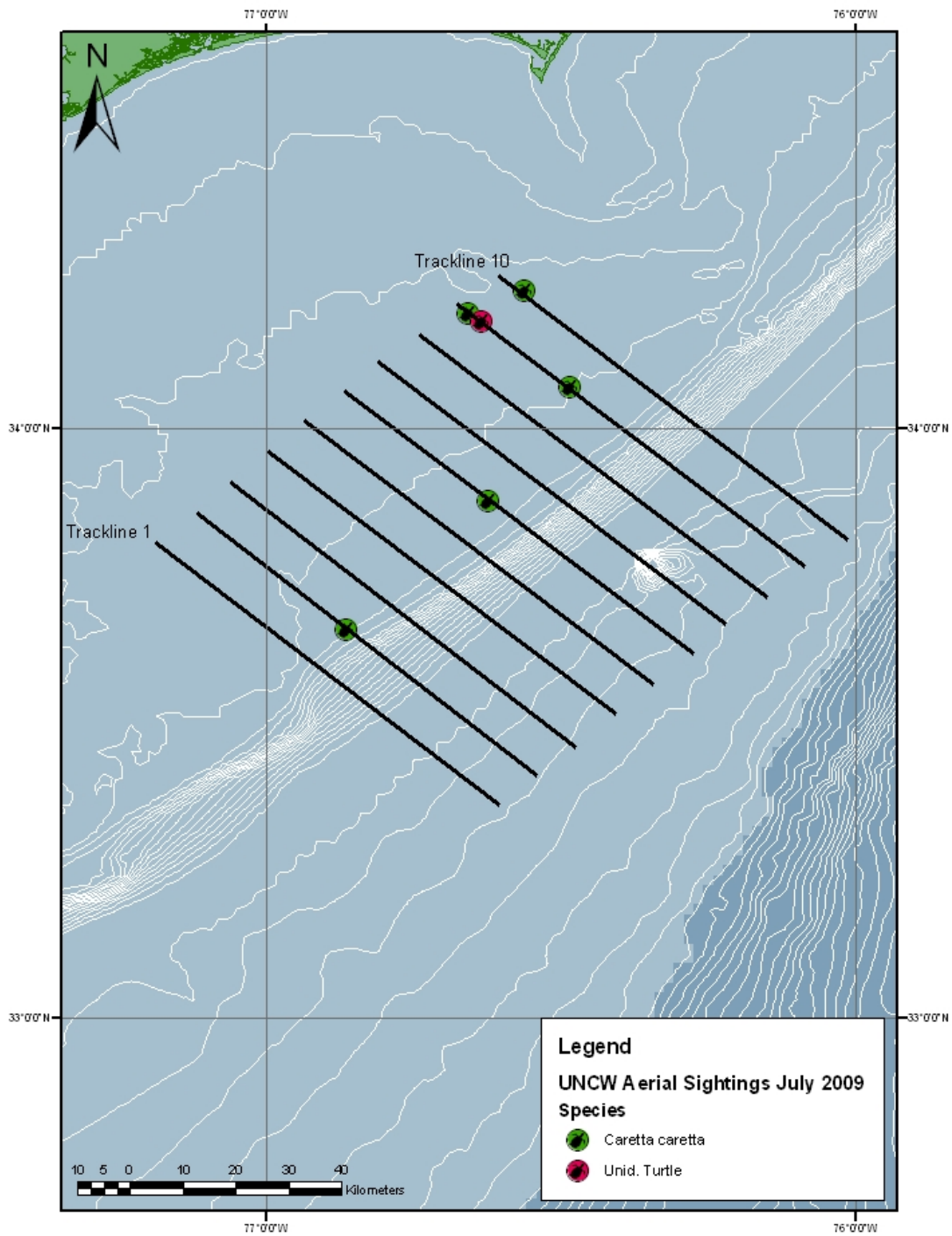


Figure 1. Location sea turtle sightings made during aerial surveys in July 2009. Refer to Tables 1 and 2.

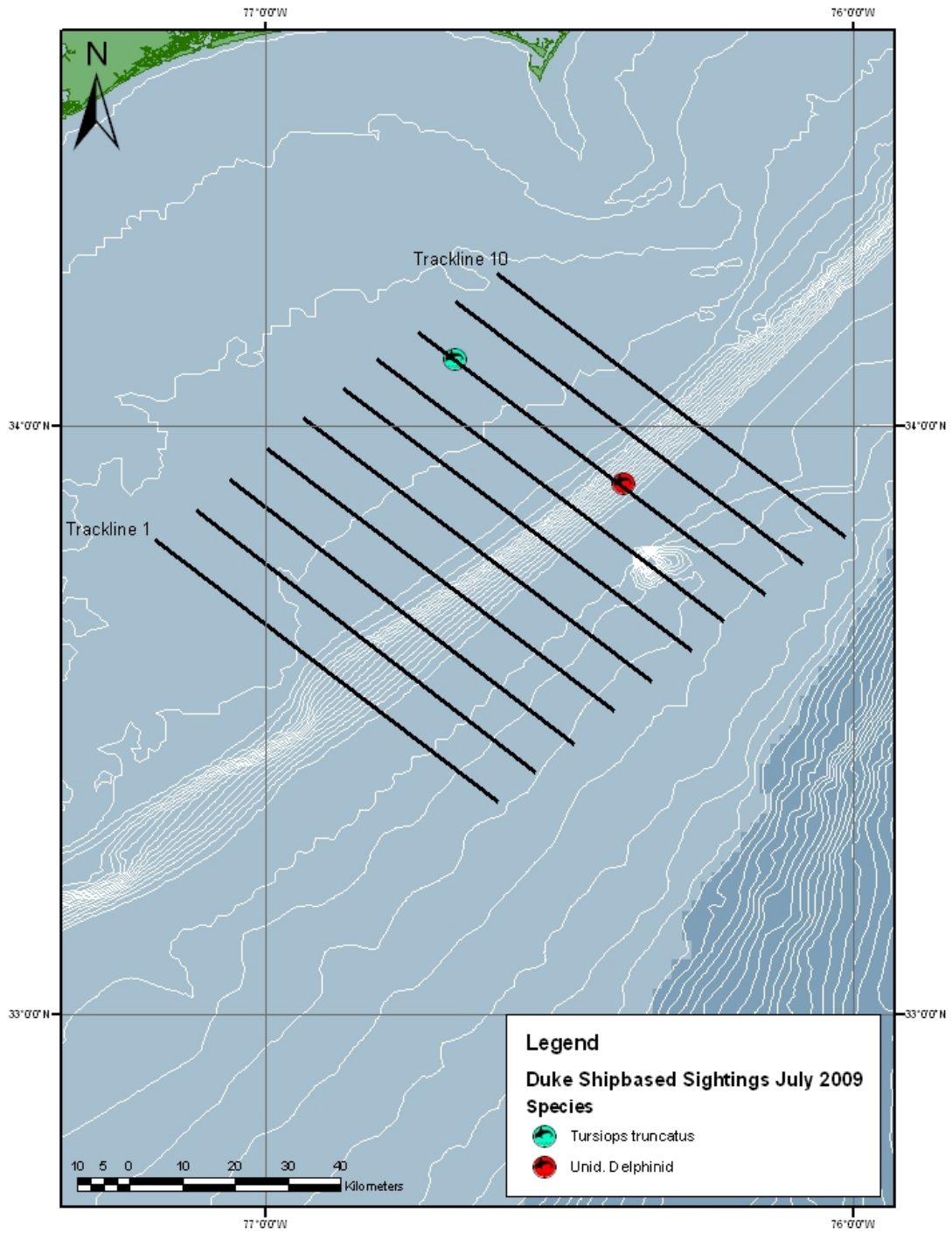


Figure 2. Location of sightings made during vessel surveys in July 2009. Refer to Table 3.

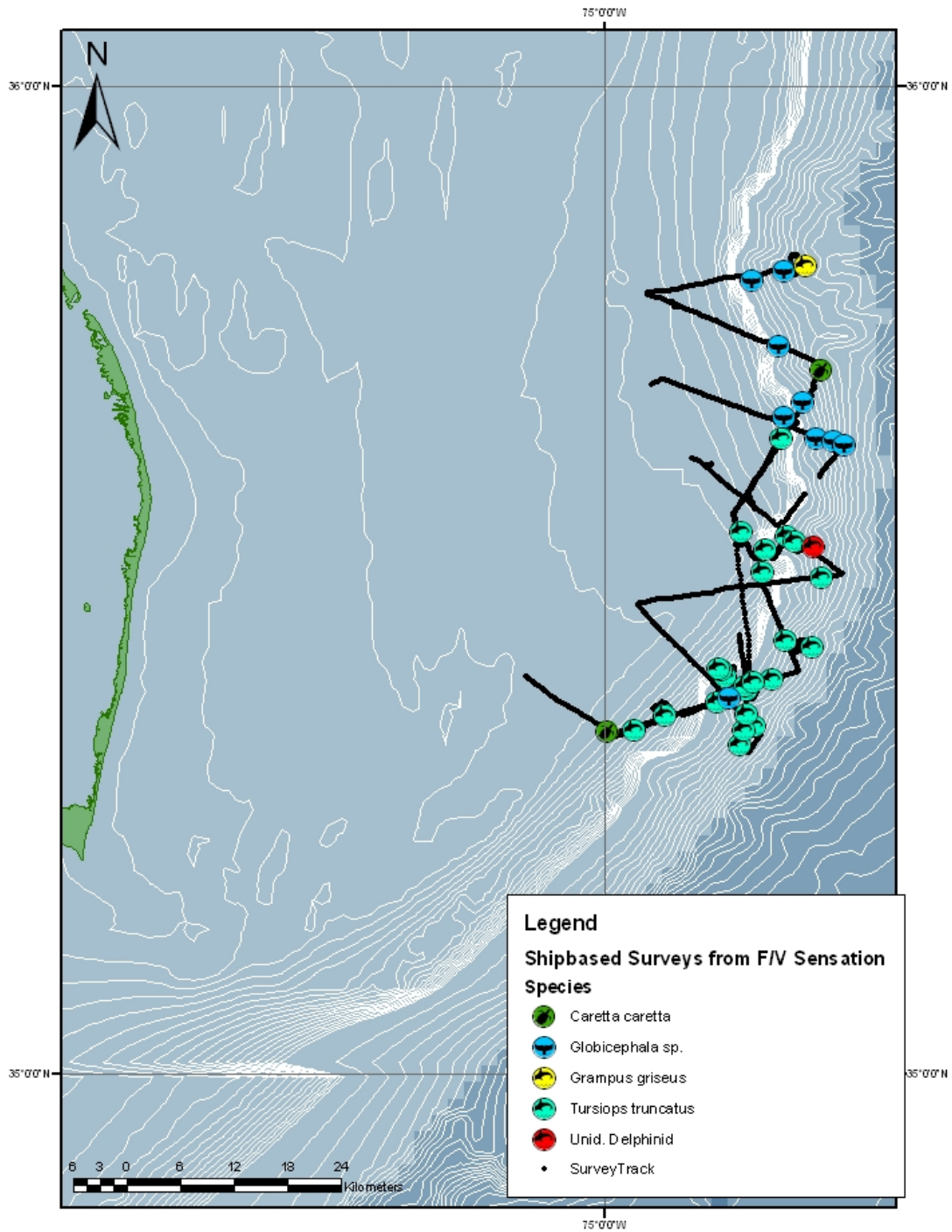


Figure 3. Location of sightings made during vessel surveys near Hatteras, NC in July 2009. Refer to Table 5.