Appendix F – Behavioral Response Study Report - 2011

This page is intentionally blank.

Hatteras Behavioral Response Experiment – June Summary

Field Work

We conducted field work on seven days in June (June 4th, 5th, 7th, 14th and 15th, 22nd and 27th). On each of these days, except for June 22nd, we had two small boats working, for a total of 13 small boat-days. In addition, we attempted to work on June 10th, but had to return to shore due to unfavorable weather conditions. Field work is highly dependent on favorable weather conditions, because we are working far from shore in small vessels and need optimal environmental conditions for tagging whales, collecting biopsy samples and conducting focal animal observations.

Over the entire duration of the field project in May and June, we worked on 13 days and were turned back by weather on two additional days. In total, we recorded 23 small boat-days; on three days we used only the larger RHIB due to marginal weather conditions.

Sightings

During our seven field days in June we recorded 46 sightings of six species of cetaceans: short-finned pilot whales (*Globicephala macrorhynchus*), bottlenose dolphins (*Tursiops truncatus*), common dolphins (*Delphinus delphis*), spotted dolphins (*Stenella frontalis*), Risso's dolphins (*Grampus griseus*) and Cuvier's beaked whales (*Ziphius cavirostris*). We encountered other groups of cetaceans while transiting to or from the field site or while conducting focal follows, but only recorded a formal sighting if we obtained photographs or collected biopsy samples. We obtained a very large number of photographic images of the dorsal fins of these animals.

Over the duration of the entire field project, we recorded 82 sightings of seven species: short-finned pilot whales, bottlenose dolphins, common dolphins, spotted dolphins, Risso's dolphins, Cuvier's beaked whales and sperm whales (*Physeter macrocephalus*). Summaries and a map of these sightings are presented in Table 1 and Figure 1, respectively.

Biopsy Sampling

In June we collected 12 biopsy samples from: bottlenose dolphins (8); spotted dolphins (2); and pilot whales (2). We focused on these species to address the following questions: (i) differentiating two forms of bottlenose dolphins (all samples were collected from the pelagic white-peduncle form); examining the taxonomic identity of the small-bodied, pelagic form of spotted dolphins; and (iii) determining sex of tagged pilot whales. Each tissue plug is sub-sampled and a reference sample is provided to the SEFSC molecular genetics laboratory in Lafayette, LA.

Over the duration of the entire field project, we collected 24 biopsy samples from bottlenose dolphins, spotted dolphins and pilot whales, plus an additional skin sample

from a pilot whale, obtained from the suction cup of a DTag. A summary of these samples is provided in Table 2.

EK-60 Experiment

We conducted two controlled exposure experimental playbacks with pilot whales on June 4th and 7th. Each whale was equipped with a DTag, programmed for a four-hour deployment. The four-hour experimental periods consist of: a one-hour pre-exposure period, a one-hour experimental or control period; a second one-hour experimental or control period; and a one-hour post-exposure period. During this four-hour period, we collect detailed, standardized behavioral observations of the focal (tagged) whale and its group from one of the small vessels using a five-minute point sampling protocol. During the experimental periods, the RV *Volute* approached the tagged whale repeatedly with the EK-60 echo sounder system on. The *Volute* made the same series of approaches in the control period, but with the echo sounder turned off. The choice of order of the control and experimental treatments was randomized for each whale. We also conducted follows on two additional pilot whales without the EK-60 or control treatments. We retrieved all four tags and downloaded and backed up data from the DTags.

Over the duration of the entire field project we conducted controlled exposure experimental playbacks with six pilot whales. We also conducted five additional four-hour focal follows on pilot whales without the EK-60 or control treatments.

Table 1. Summary of cetaceans sighted during Hatteras field work in May and June 2011.

Date	Sighting	Time	Species	Group Size	Latitude	Longitude
22-May-11	B1	8:51	*Stenella frontalis*	4	35.674	-75.005
22-May-11	B2	10:27	*Tursiops truncatus*	70	35.66949	-74.74038
22-May-11	B3	11:30	*Tursiops truncatus*	7	35.68464	-74.67881
22-May-11	B4	11:52	*Globicephala macrorhynchus*	25	35.68702	-74.66536
22-May-11	B5	12:56	*Stenella frontalis*	12	35.74298	-74.62028
22-May-11	B6	13:49	*Stenella frontalis*	60	35.7634	-74.6202
22-May-11	B7	14:04	*Globicephala macrorhynchus*	17	35.76335	-74.82384
22-May-11	B8	14:11	*Delphinus delphis*	70	35.76079	-74.83132
22-May-11	B9	14:40	*Stenella frontalis*	200	35.76853	-74.91307
22-May-11	E1	10:07	*Tursiops truncatus*	5	35.6524	-74.77062
22-May-11	E2	11:07	*Delphinus delphis*	60	35.76184	-74.75237
22-May-11	V1	10:09	*Tursiops truncatus*	25	35.65855	-74.76104
22-May-11	V2	10:22	*Tursiops truncatus*	2	35.68451	-74.76089
22-May-11	V3	11:10	*Stenella* and *Delphinus* mixed	85	35.75422	-74.73673
22-May-11	V4	11:39	*Physeter macrocephalus*	1	35.72287	-74.7485
22-May-11	V5	12:46	*Stenella frontalis*	6	35.73597	-74.6263
27-May-11	V1	8:47	*Globicephala macrorhynchus*	175	35.76695	-74.84396
27-May-11	V2	10:16	*Delphinus delphis*	180	35.82286	-74.84621
28-May-11	B1	9:13	*Globicephala macrorhynchus*	200	35.77507	-74.84182
28-May-11	B2	11:08	*Tursiops truncatus*	14	35.83066	-74.85011
28-May-11	B3	12:12	*Tursiops truncatus*	20	35.81302	-74.85911
28-May-11	B4	13:24	*Globicephala macrorhynchus*	10	35.82244	-74.85199
28-May-11	B5	13:34	*Stenella* and *Tursiops* mixed	100	35.81615	-74.84311
28-May-11	E1	10:19	*Globicephala macrorhynchus*	150	35.82513	-74.84387
28-May-11	V1	10:18	*Globicephala macrorhynchus*	2	35.81523	-74.84223
28-May-11	V2	10:29	*Globicephala macrorhynchus*	8	35.82165	-74.84027
28-May-11	V3	11:36	*Tursiops truncatus*	5	35.82815	-74.84297
29-May-11	B1	8:36	*Globicephala macrorhynchus*	6	35.76771	-74.84687
29-May-11	B2	9:26	*Tursiops truncatus*	23	35.78859	-74.86766
29-May-11	E1	9:35	*Delphinus delphis*	300	35.71342	-74.82291
30-May-11	B1	9:32	*Tursiops truncatus*	35	35.77398	-74.82673
30-May-11	E1	8:57	*Globicephala macrorhynchus*	5	35.77818	-74.82819
30-May-11	E2	9:26	*Globicephala macrorhynchus*	8	35.76665	-74.83062
30-May-11	V1	10:38	*Globicephala macrorhynchus*	10	35.75297	-74.81944
31-May-11	B1	8:08	*Stenella frontalis*	40	35.76367	-74.83739
31-May-11	B2	11:00	*Globicephala macrorhynchus*	15	35.67146	-74.79037

Date	Sighting	Time	Species	Group Size	Latitude	Longitude
4-Jun-11	B1	9:14	*Tursiops truncatus*	5	35.75249	-74.82539
4-Jun-11	B2	9:33	*Tursiops truncatus*	2	35.72084	-74.82166
4-Jun-11	B3	9:42	*Globicephala macrorhynchus*	5	35.70971	-74.81271
4-Jun-11	B4	12:29	*Globicephala macrorhynchus*	10	35.6438	-74.79733
4-Jun-11	E1	10:15	*Delphinus delphis*	100	35.69777	-74.80251
4-Jun-11	V1	9:57	*Globicephala macrorhynchus*	2	35.69798	-74.80228
4-Jun-11	V2	10:43	*Globicephala macrorhynchus*	1	35.69175	-74.79873
4-Jun-11	V3	11:03	*Globicephala macrorhynchus*	8	35.68	-74.7961
4-Jun-11	V4	11:42	*Stenella frontalis*	10	35.66037	-74.79218
5-Jun-11	B1	9:20	*Tursiops truncatus*	3	35.73866	-74.81767
5-Jun-11	B2	13:12	*Globicephala macrorhynchus*	20	35.67477	-74.80109
5-Jun-11	E1	8:06	*Tursiops truncatus*	12	35.76921	-74.86395
5-Jun-11	E2	9:19	*Globicephala macrorhynchus*	10	35.72902	-74.79087
5-Jun-11	E3	12:23	*Globicephala macrorhynchus*	8	35.699	-74.80823
5-Jun-11	V2	9:31	*Tursiops truncatus*	35	35.71482	-74.81172
5-Jun-11	V3	9:43	*Globicephala macrorhynchus*	25	35.72006	-74.81215
5-Jun-11	V4	13:31	*Grampus griseus*	2	35.68501	-74.80247
7-Jun-11	B1	8:25	*Tursiops truncatus*	12	35.75553	-74.82542
7-Jun-11	B2	9:32	*Globicephala macrorhynchus*	20	35.68613	-74.82628
7-Jun-11	B3	13:02	*Globicephala macrorhynchus*	18	35.66403	-74.79174
7-Jun-11	B4	13:20	*Globicephala macrorhynchus*	16	35.67617	-74.78573
7-Jun-11	B5	13:38	*Tursiops truncatus*	20	35.65343	-74.74834
7-Jun-11	B6	15:23	*Ziphius cavirostris*	2	35.67935	-74.74805
7-Jun-11	B7	16:37	*Ziphius cavirostris*	1	35.68195	-74.73997
7-Jun-11	B8	16:45	*Grampus griseus*	10	35.68925	-74.73539
7-Jun-11	E1	9:51	*Globicephala macrorhynchus*	11	35.66605	-74.79681
7-Jun-11	E2	11:31	*Globicephala macrorhynchus*	24	35.64219	-74.76755
14-Jun-11	B1	11:01	*Globicephala macrorhynchus*	2	35.71511	-74.81673
14-Jun-11	B2	11:48	*Globicephala macrorhynchus*	8	35.72178	-74.82515
14-Jun-11	B3	13:16	*Stenella frontalis*	250	35.74269	-74.76673
14-Jun-11	E1	8:54	*Globicephala macrorhynchus*	25	35.76689	-74.83763
14-Jun-11	V1	9:15	*Globicephala macrorhynchus*	12	35.73944	-74.82874
14-Jun-11	V2	10:52	*Globicephala macrorhynchus*	7	35.71122	-74.81505
14-Jun-11	V3	11:13	*Tursiops truncatus*	3	35.70616	-74.81577
14-Jun-11	V4	11:36	*Tursiops truncatus*	5	35.71457	-74.82011
15-Jun-11	B1	8:45	*Tursiops truncatus*	12	35.7535	-74.87021
15-Jun-11	E1	9:38	*Globicephala macrorhynchus*	8	35.73631	-74.82008
22-Jun-11	B1	9:16	*Delphinus delphis*	40	35.73769	-74.8148
22-Jun-11	B2	11:33	*Tursiops truncatus*	2	35.69224	-74.78816
22-Jun-11	B3	11:48	*Tursiops truncatus*	3	35.71503	-74.80618
22-Jun-11	V1	9:30	*Tursiops truncatus*	11	35.69142	-74.80754
22-Jun-11	V2	10:12	*Ziphius cavirostris*	3	35.62452	-74.77865
22-Jun-11	V3	11:44	*Tursiops truncatus*	8	35.71599	-74.80991
27-Jun-11	E1	8:10	*Tursiops truncatus*	35	35.76107	-74.87994
27-Jun-11	E2	9:05	*Tursiops truncatus*	25	35.77208	-74.85796
27-Jun-11	B1	8:49	*Tursiops truncatus*	4	35.75664	-74.87316

Table 2. Summary of biopsy samples collected during Hatteras field work in May and June 2011.

Date	Time	Sighting	Sample ID	Species	Latitude	Longitude
22-May-11	10:44	B2	ASF-11-001	*Tursiops truncatus*	35.67123	-74.72522
22-May-11	10:18	E1	AJR-11-001	*Tursiops truncatus*	35.66209	-74.75659
28-May-11	13:35	B5	ASF-11-002	*Stenella frontalis*	35.81585	-74.84232
28-May-11	13:46	B5	DWJ-11-001	*Stenella frontalis*	35.80945	-74.84123
28-May-11	14:00	B5	ASF-11-003	*Tursiops truncatus*	35.80134	-74.84249
28-May-11	14:17	B5	DWJ-11-002	*Tursiops truncatus*	35.78807	-74.84852
28-May-11	14:40	E1	DWJ-11-003	*Globicephala macrorhynchus*	35.82768	-74.86831
29-May-11	14:19	B1	AJR-11-002	*Globicephala macrorhynchus*	35.65667	-74.80293
29-May-11	9:38	B2	ASF-11-004	*Tursiops truncatus*	35.78540	-74.86247
29-May-11	9:48	B2	ASF-11-005	*Tursiops truncatus*	35.78767	-74.86603
31-May-11	8:23	B1	DWJ-11-004	*Stenella frontalis*	35.76794	-74.84226
31-May-11	8:27	B1	DWJ-11-005	*Stenella frontalis*	35.76300	-74.83738
4-Jun-11	8:20	Off Effort	ASF-11-006	*Tursiops truncatus*	35.76367	-74.90083
4-Jun-11	9:18	B1	ASF-11-007	*Tursiops truncatus*	35.74990	-74.82753
5-Jun-11	8:13	E1	AJR-11-003	*Tursiops truncatus*	35.76921	-74.86395
7-Jun-11	8:30	B1	AJR-11-004	*Tursiops truncatus*	35.75630	-74.82715
7-Jun-11	13:54	B5	DWJ-11-006	*Tursiops truncatus*	35.64967	-74.73486
7-Jun-11	14:06	B5	DMW-11-001	*Tursiops truncatus*	35.64567	-74.72442
7-Jun-11	16:09	E2	AJR-11-005	*Globicephala macrorhynchus*	35.74261	-74.70855
14-Jun-11	13:16	B3	ASF-11-008	*Stenella frontalis*	35.74269	-74.76673
14-Jun-11	13:21	B3	ASF-11-009	*Stenella frontalis*	35.74195	-74.76464
14-Jun-11	13:21	V1	AJR-11-006	*Globicephala macrorhynchus*	35.73006	-74.81523
27-Jun-11	8:12	E1	AJR-11-007	*Tursiops truncatus*	35.76071	-74.88148
27-Jun-11	8:19	E1	AJR-11-008	*Tursiops truncatus*	35.75779	-74.88146

Figure 1. Summary of cetaceans sighted during Hatteras field work in May and June 2011.