

# Jacksonville (JAX) Firing Exercise (FIREX) with Integrated Maritime Portable Acoustic Scoring and Simulator (IMPASS)

## Marine Species Monitoring

### AERIAL MONITORING SURVEYS

### TRIP REPORT



5-8 September 2012

**Suggested citation:**

HDR. 2012. Jacksonville (JAX) Firing Exercise (FIREX) With Integrated Maritime Portable Acoustic Scoring and Simulator (IMPASS) Marine Species Monitoring, Aerial Monitoring Surveys, 5-8 September 2012: Trip Report. Submitted to Naval Facilities Engineering Command (NAVFAC) Atlantic, Norfolk, Virginia, under Contract No. N62470-10-D-3011 Task Order 03, issued to HDR Inc., Norfolk, Virginia.

**Cover Photo:** Atlantic spotted dolphins (*Stenella frontalis*) off JAX, photo taken under NOAA Permit 14551

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**ACRONYMS AND ABBREVIATIONS**

BL&P	Blind Loaded and Plugged
BSS	Beaufort sea state
FIREX	Firing Exercise
hr	hour(s)
ICMP	Integrated Comprehensive Monitoring Program
IMPASS	Integrated Maritime Portable Acoustic Scoring and Simulator
JAX	Jacksonville
km	kilometer(s)
km <sup>2</sup>	square kilometer(s)
m	meter(s)
min	minute(s)
MMO	Marine Mammal Observer
NEPM	Non-Explosive Practice Munition
OPAREA	operating area
SPUE	Sightings Per Unit Effort
U.S.	United States

## Section 1 Introduction

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Aerial marine species monitoring occurred 5 through 8 September 2012 for a Firing Exercise (FIREX) with Integrated Maritime Portable Acoustic Scoring and Simulator (IMPASS) event that occurred in the Jacksonville (JAX) Range Complex off the eastern coast of Florida within the United States (U.S.) Navy's FIREX boxes BB and CC. These types of events occur periodically throughout the year and allow the U.S. Navy to fulfill essential training requirements.

As part of the compliance requirements of the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973, the U.S. Navy developed the Integrated Comprehensive Monitoring Program (ICMP). The ICMP applies by regulation to those activities on U.S. Navy training ranges and operating areas (OPAREAs) for which the U.S. Navy sought and received incidental take authorizations. In order to support the U.S. Navy in meeting regulatory requirements for monitoring established under the Final Rules and to provide a mechanism to assist with coordination of program objectives under the ICMP, monitoring of marine mammals and sea turtles during this exercise included visual surveys from a fixed-wing aircraft.

The results of marine mammal monitoring reported here are part of a long-term monitoring effort under the U.S. Navy's Marine Species Monitoring Program (Contract # N62470-10-D-3011 issued to HDR).

## Section 2 Methods

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### Study Area

The U.S. Navy's JAX OPAREA lies off the Atlantic coast of the U.S. near the Georgia/Florida border. Protected marine species monitoring conducted during the FIREX training event was focused on the BB and CC boxes within the JAX OPAREA (see **Figure 1**). This area is approximately 81 to 167 kilometers (km) offshore, covers an area approximately 1,376 square kilometers (km<sup>2</sup>) in size, and ranges in bottom depth from 30 to 800 meters (m).

### Event Details

The FIREX event commenced at 11:30 Eastern Daylight Time on 7 September 2012, with a total of 38 5-inch Non-Explosive Practice Munition (NEPM) Blind Loaded and Plugged (BL&P) rounds fired. In addition, the unit also shot five 5-inch NEPM Illumination rounds. NEPM was used first, which resulted in a successful training mission. Thus, no live-explosive rounds were used during the FIREX training. Therefore, no animals were exposed to explosive sounds during this FIREX with IMPASS training event.

### Aerial-Based Monitoring

Aerial-based monitoring was performed before, during, and after a FIREX with IMPASS within the JAX OPAREA from 5 through 8 September 2012 (see **Figure 1, Table 1**). Survey methods were consistent with currently accepted Distance Sampling theory (Buckland et al. 2001) and

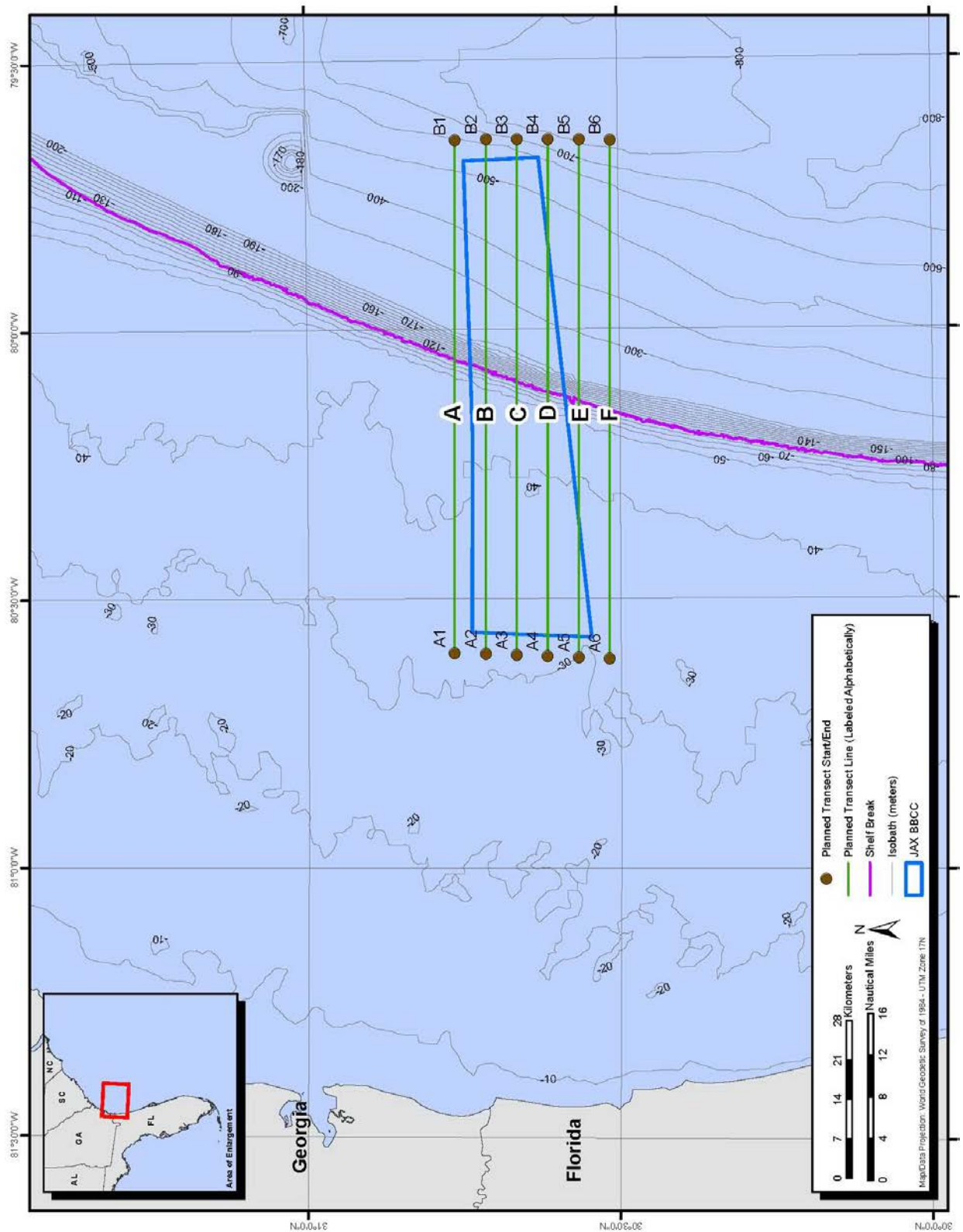


Figure 1. Pre-planned Tracklines for the Survey Effort for JAX FIREX Monitoring.

**Table 1. Summary of Monitoring Effort for the JAX FIREX Training.**

Date	Description	Start Time	Stop Time	Total Survey Minutes*	Total On-Effort Minutes	Trackline On-Effort Distance (km)
5 September	Transect survey (Pre-Event)	13:58	17:11	194	165	561.2
6 September (Morning)	Transect survey (Pre-Event)	08:40	11:36	176	164	552.6
6 September (Afternoon)		14:09	17:53	223	165	565.8
7 September	Transect survey (During Event)	08:43	10:40	117	110	363.9
8 September	Transect survey (Post-Event)	08:31	11:22	171	158	546.8
<b>Total</b>				<b>881</b> (≈15 hours)	<b>762</b> (≈13 hours)	<b>2,590.3 km</b>

Note: \* Total Survey Minutes reflect minutes occupied in the range/area of interest and include both on-effort (systematic) and off-effort (connector-legs between transects and circling for focal follows or species ID) total minutes. Total Survey Minutes may not match the difference between Start Time and Stop Time in the table due to differences in rounding.

followed a well-established protocol used for aerial surveys throughout all U.S. Navy Range Complexes (Smultea et al. 2009). A survey altitude of approximately 305 meters at 185 km/hour knots was maintained while on-effort, but might have varied slightly based on weather conditions in the area. Once a marine mammal sighting was made, a focal-follow session was initiated at 305 m or higher if conditions were appropriate (Smultea et al. 2009; refer to the survey methods on page 4 of this document). A lower altitude of approximately 214 m was established after focal-follow sessions for photography purposes to provide sharper images required for species identification.

The observation platform was a Cessna T337H Turbo Skymaster aircraft operating out of Fernandina Beach Municipal Airport in Fernandina Beach, Florida. Five surveys were conducted following pre-planned transect lines covering and extending approximately 1.8 km beyond the boundaries of the BB and CC boxes (see **Figure 1**). Each survey was limited to a 5-hour (hr) maximum flight time window based on fuel limitations. The during-FIREX monitoring on 7 September resulted in just four (A1 through A4) lines surveyed due to the U.S. Navy's request for the aircraft to exit the survey area by 10:40 to enable commencement of the FIREX.

Both aerial observers (see **Table 2**) were experienced with line-transect survey methodology, had experience in identification of Atlantic marine mammal and sea turtle species, and were knowledgeable of marine mammal biology and behavior.

**Table 2. Observers and Roles.**

Observer	Role(s)
Lenisa Blair	Chief Scientist/Observer
Mark Cotter	Observer

Survey effort included the entirety of the BB and CC boxes (approximately 1,376 km<sup>2</sup>). Six parallel tracklines running west-east, measuring 92 km in length and spaced approximately 5.3 km apart, were flown during “systematic” efforts throughout the monitoring period. Based on an effective sampling width of approximately six km (three km distance on each side of the transect line to reliably sight a group of 25 or more dolphins in optimal conditions at an altitude of 305 m), our total survey coverage area was 3,312 km<sup>2</sup> (see **Figure 1**). Planned lines were followed when possible, but exact transects flown for each survey day were subject to modifications as a result of range exclusion by live-fire U.S. Navy exercises in the area, unfavorable weather conditions on the range, or hourly contact with naval flight operations requiring an increase in the plane’s altitude (see **Table 1, Figures 2 through 7**). Without prior notification to the monitoring team, the IMPASS target location was relocated to the west of the primary BB/CC range boxes. This shift resulted in the monitoring team surveying the area adjacent to the actual exercise location (see **Figures 2 through 7**).

The following describe the general survey approach:

1. Pre-planned transect lines and waypoints were followed using methods described by Smultea et al. (2009) until a marine mammal/sea turtle group was sighted. Standard environmental and oceanographic parameters such as Beaufort sea state (BSS), glare, visibility, and cloud cover were recorded at the start of each transect line as well as when conditions changed during flight.
2. Upon sighting a marine mammal/sea turtle group, basic sighting information was recorded per established protocol (see Smultea et al. 2009). As outlined in the *Jacksonville Range Complex Monitoring Plan*, information included (1) species identification and group size; (2) location and relative distance from the IMPASS buoy field if available; (3) the behavior of marine mammals and sea turtles; (4) date, time, visual conditions, and environmental and oceanographic parameters associated with each observation; (5) direction of travel relative to true North; and (6) duration of the observation.
3. If the species appeared suitable for a focal follow, the aircraft increased altitude to approximately 365 to 455 m and radial distance increased to approximately 0.5 to 1.0 km. Then, the aircraft circled the sighting to obtain detailed behavioral information as long as possible and logistically feasible. Focal follows were attempted for a minimum of 5 minutes (min). When conditions allowed, High Definition video and digital photographs of the group were also collected.
4. If the sighting was not selected for a focal follow, and species and group size were unknown, the aircraft circled the sighting to obtain digital photographs for species identification confirmation and to estimate group size/composition.



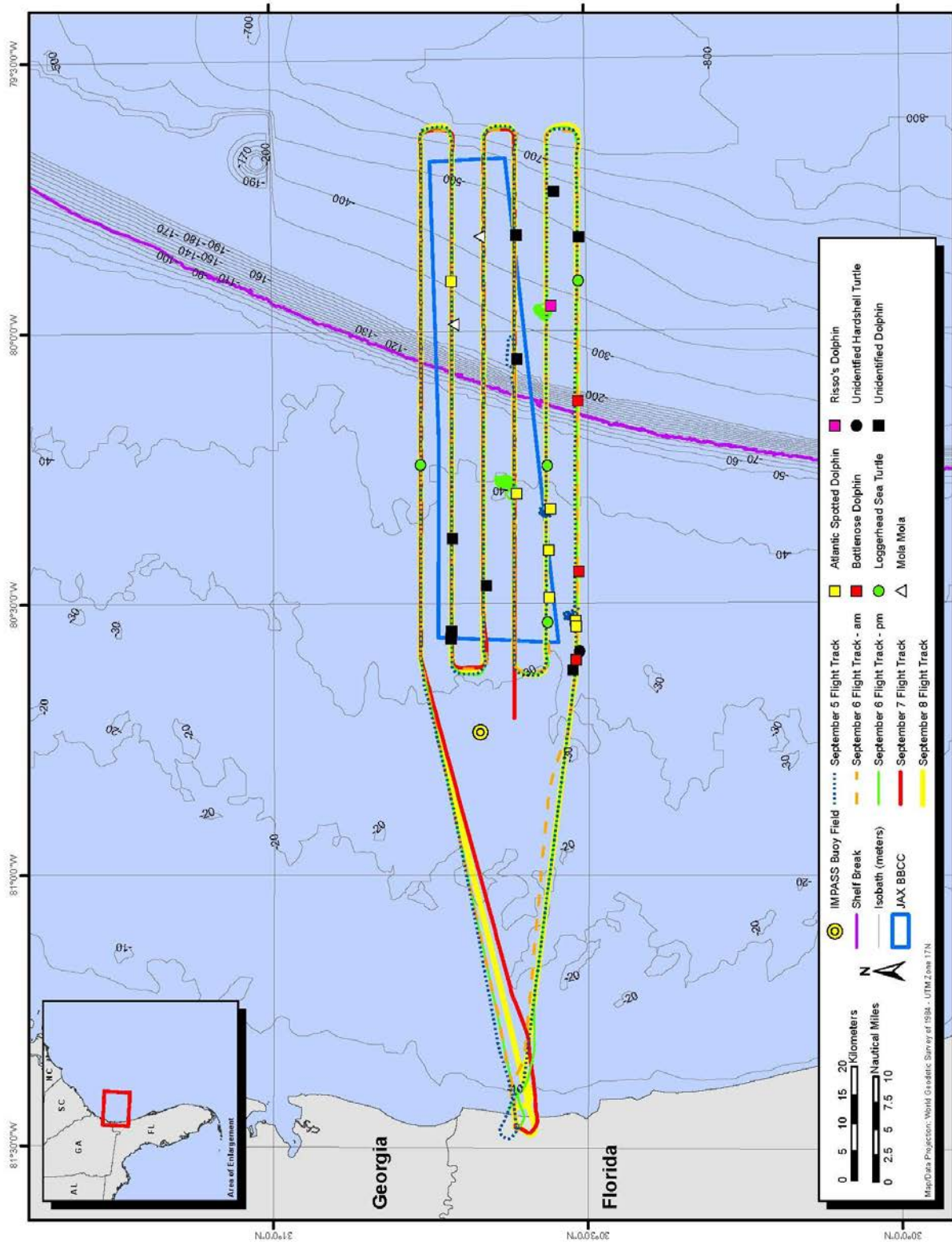


Figure 2. Locations of All Cetacean, Sea Turtle, and Fish Sightings Recorded During JAX FIREX Monitoring (5-8 September).

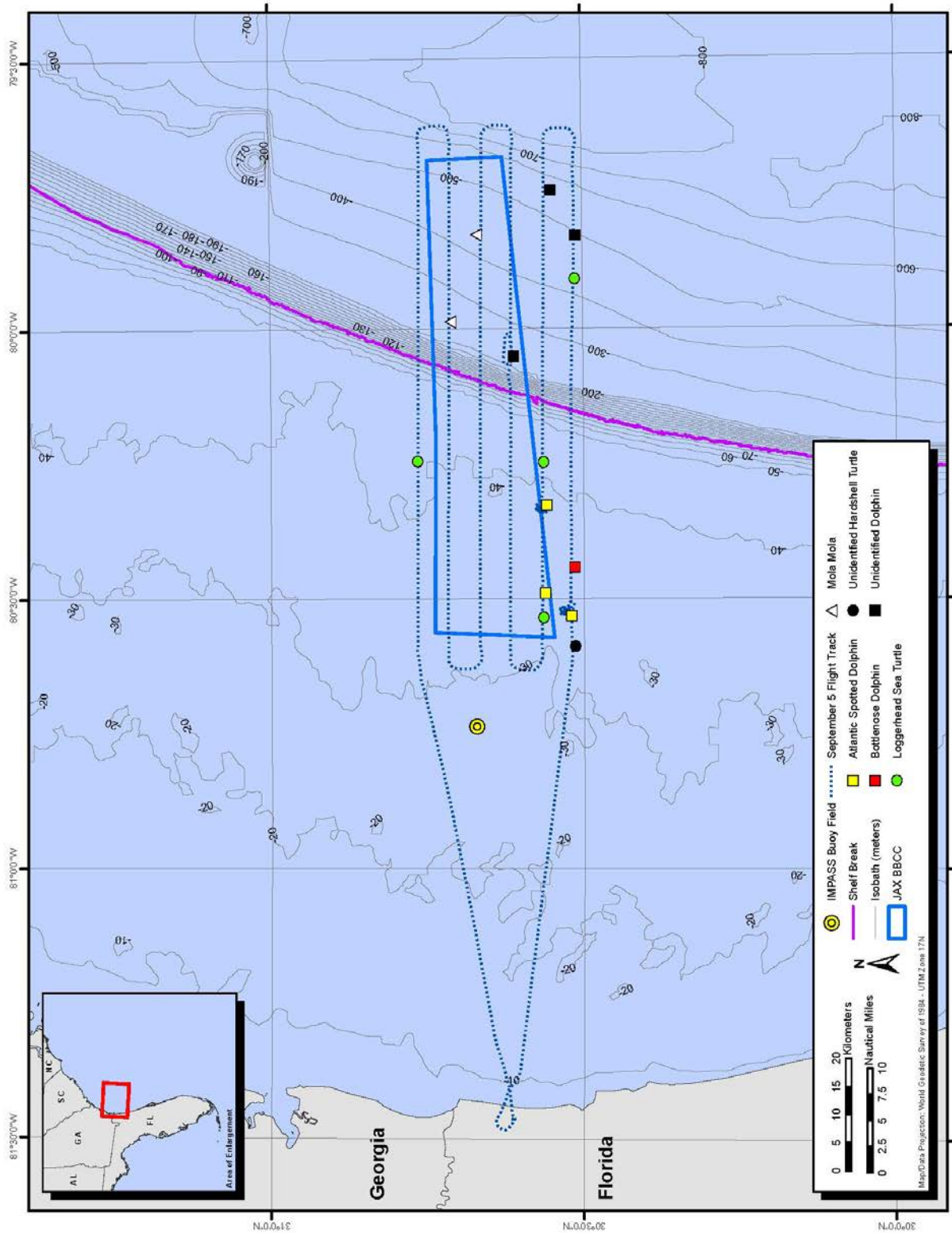


Figure 3. Locations of All Cetacean, Sea Turtle, and Fish Sightings Recorded Pre-FIREX Training (5 September).

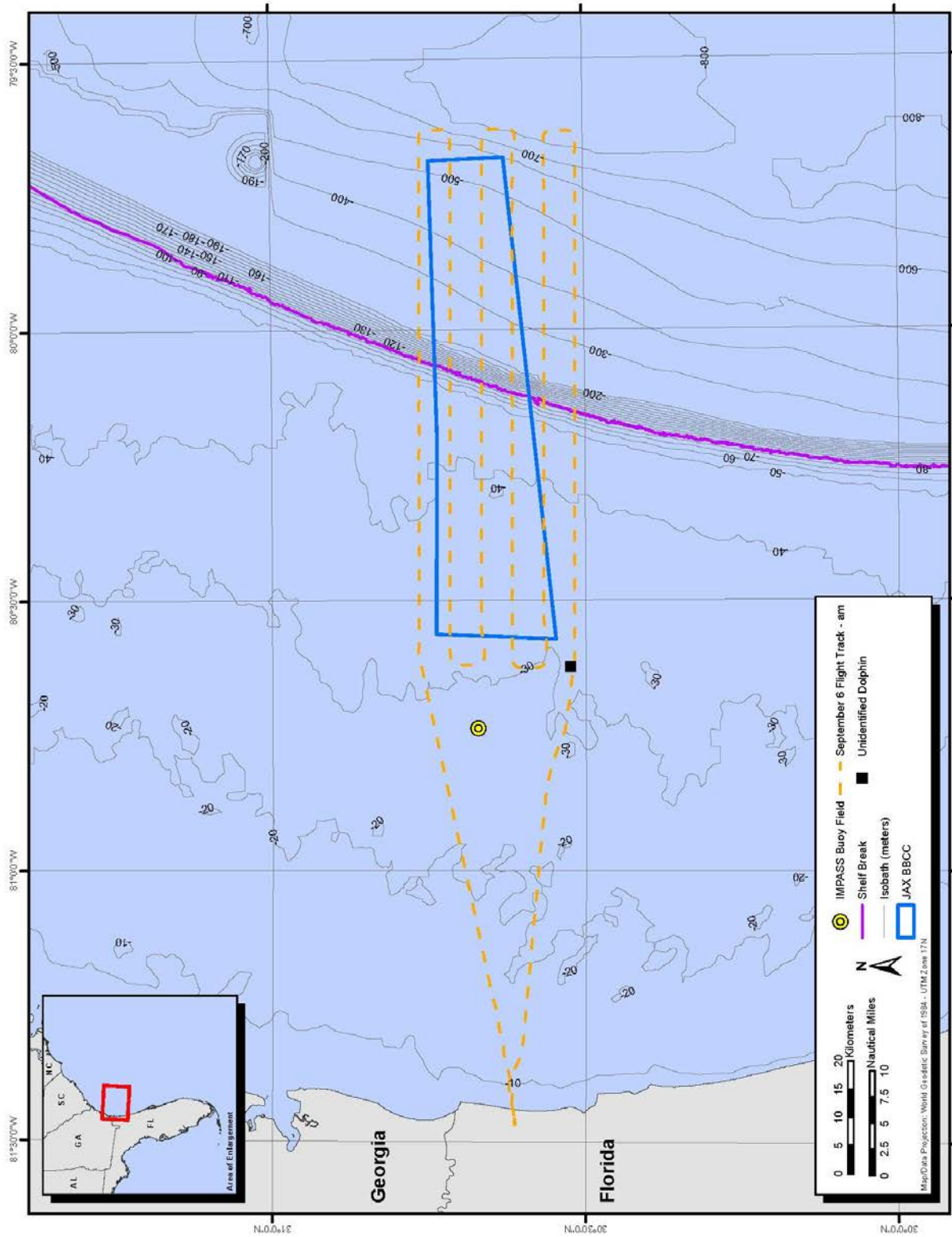


Figure 4. Locations of Cetacean Sightings Recorded Pre-FIREX Training (6 September Morning Flight).



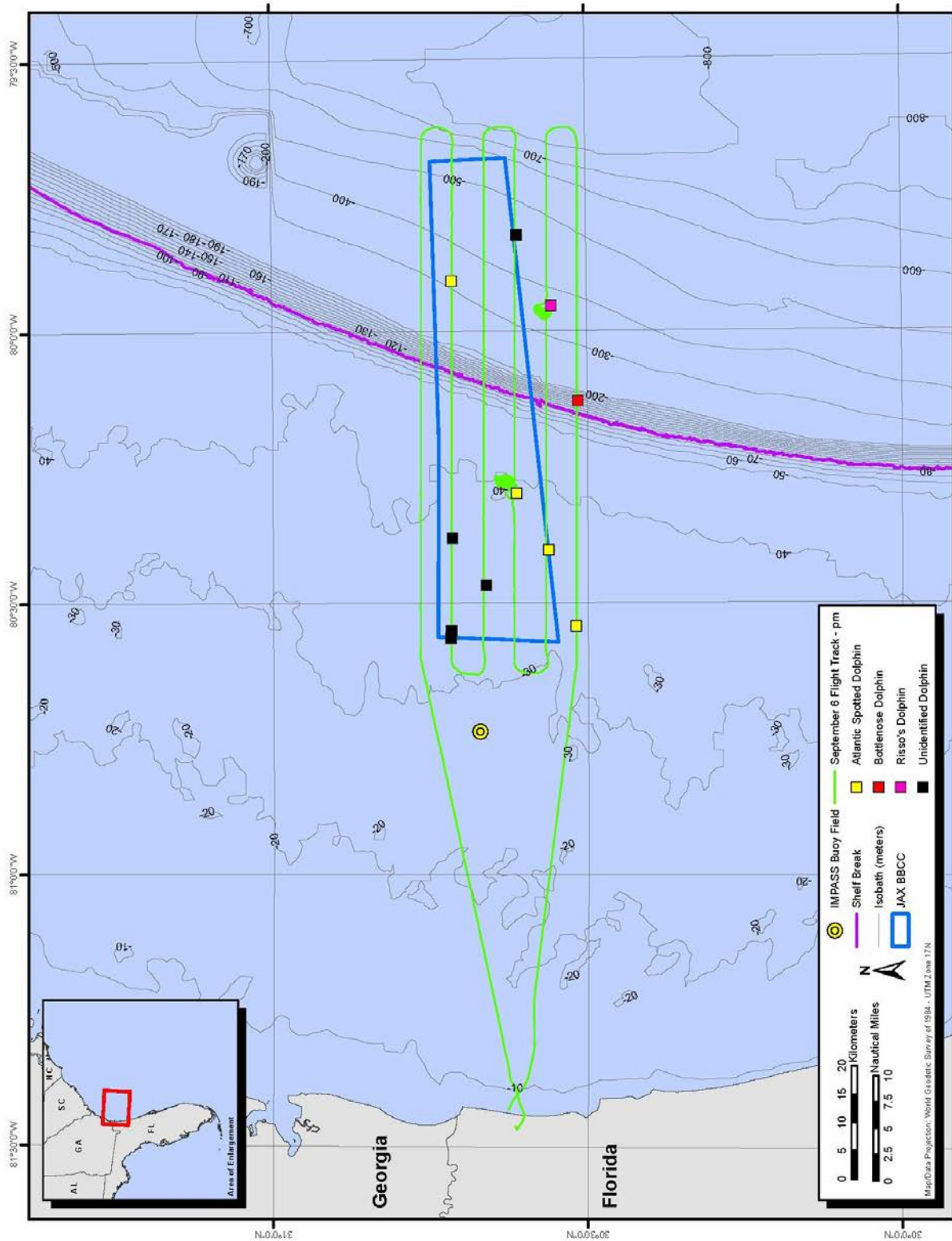


Figure 5. Locations of Cetacean Sightings Recorded Pre-FIREX Training (6 September Afternoon Flight).

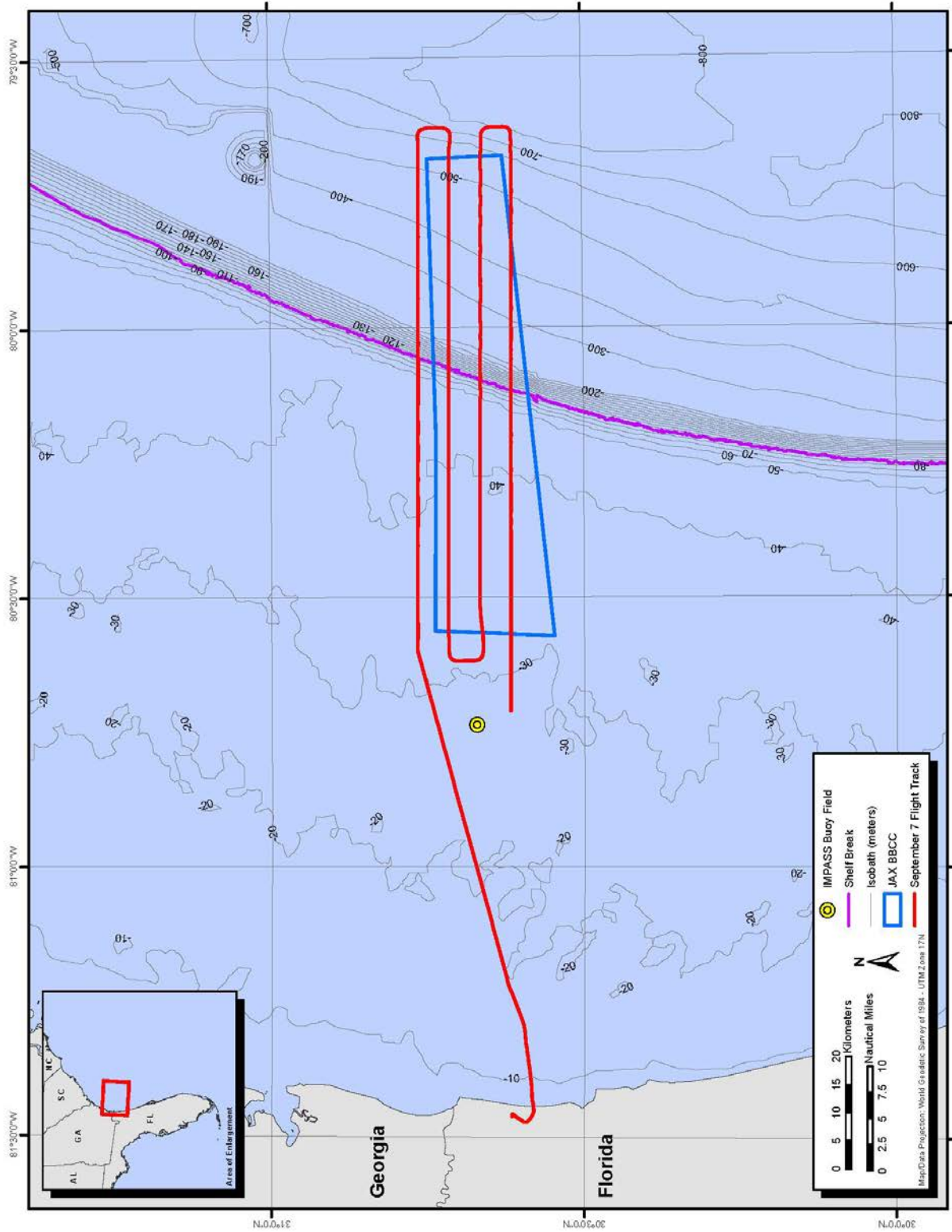


Figure 6. Aircraft Track Conducted During-FIREX Training (7 September).

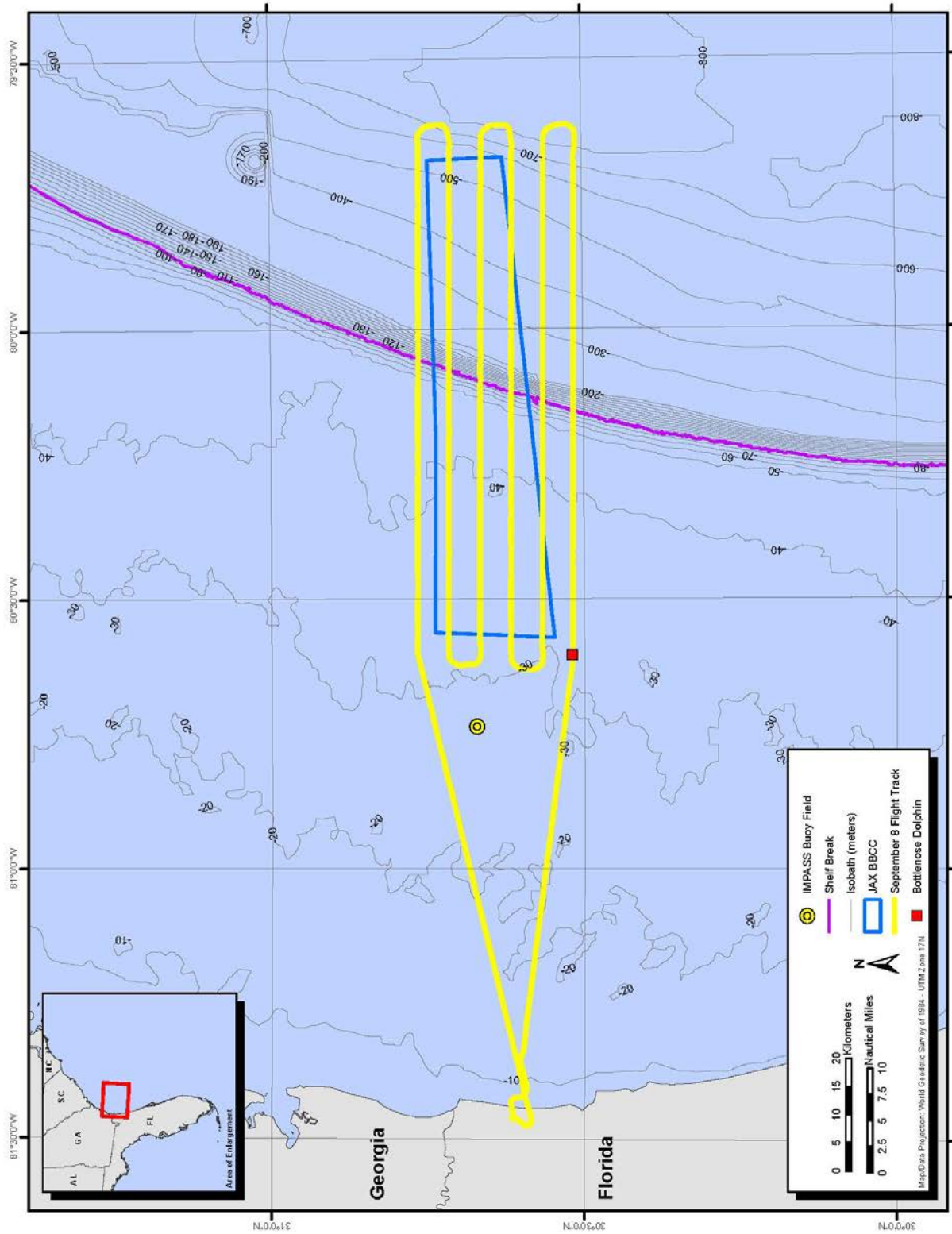


Figure 7. Locations of Cetacean Sightings Recorded Post-FIREX Training (8 September).

## Section 3 Results

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### Survey Effort

Observers visually surveyed 2,590.3 km of on-effort trackline and an additional 399.0 km of off-effort trackline (connector lines and circling for focal follow or species ID) during 4 survey days for approximately 13 hr of on-effort status (see **Table 1; Figures 2 through 7**). BSS ranged from 2 to 5 (**Appendix A**), and sightings were made during all sea states except for BSS 5 (see **Table 3**). Only one potential survey flight (the afternoon of 7 September) was cancelled due to heavy rain, lightning, and low cloud ceilings that restricted both visibility and safe flying conditions. **Appendix A** contains a detailed description of environmental, oceanographic, and sighting conditions.

### Sightings

Twenty sightings of marine mammals, five sightings of sea turtles, and two sightings of fish were recorded during approximately 15 hr of total survey flight time (includes on-effort and off-effort intervals) within the survey area (see **Figure 2, Table 3**). Sightings of sea turtles were not recorded throughout the entire survey (i.e., only part of the first day of survey effort), since Marine Mammal Observers (MMOs) focused instead on observing for marine mammals while working on integrating new survey software directed by the U.S. Navy. Five sightings of sea turtles and 19 sightings of marine mammals were made during the pre-FIREX surveys on 5 and 6 September (see **Figures 3 through 5, Table 3**). No sightings were made for the during-FIREX survey period (see **Figure 6, Table 3**). One sighting of a bottlenose dolphin (*Tursiops truncatus*) was made during the one-day post-FIREX survey (see **Figure 7, Table 3**). Sightings over the 4-day period included seven groups of Atlantic spotted dolphins (*Stenella frontalis*), three groups of bottlenose dolphins, one group of Risso's dolphins (*Grampus griseus*), nine groups of unidentified dolphins, four loggerhead turtles (*Caretta caretta*), one unidentified sea turtle, and two ocean sunfish (*Mola mola*). When conditions allowed, photographs and/or video were taken to assist with species identification, confirm group size estimates, and document behavior (see **Table 3**). Several unidentified species sightings were unable to be confirmed with photographs due to difficulties in relocating and circling small groups. **Table 4** provides a summary of information on sightings and associated bottom depths. Bottom depths for each sighting were estimated in 10-m ranges from plots of latitude and longitude for each sighting within a Geographic Information System.

#### *Sighting Per Unit Effort*

Sighting Per Unit Effort (SPUE) was calculated as the total number of marine mammal sightings ( $n=20$ ) divided by the total survey effort (hours and km). For this monitoring effort, the SPUE for marine mammals was equal to 1.362 sightings/hr and 0.006 sightings/km. SPUE for sea turtles was not calculated due to lack of recordings made while MMOs focused on the integration and testing of new survey software (as previously discussed with the U.S. Navy) during the flight.



Table 3. Summary of Sightings.

Sighting No.	Date	Species	Group Size Best/High/Low			Calves	Start Time	Stop Time	Beaufort Sea State	Latitude	Longitude	Vert. Angle	Distance off Track (km)	Heading	Bottom Depth (m)	Photos/Videos Taken	Behavioral Summary
<b>Pre-FIREX Sightings on 5 September 2012</b>																	
1	9/5/12	Cc	1	1	1	-	14:08	-	3	30.766	-80.245	052	0.46	-	40-50	No/No	Loggerhead turtle resting at the surface. No disturbance detected.
2	9/5/12	Mm	1	1	1	-	14:36	-	2	30.714	-79.980	030	0.67	-	200-300	No/No	Ocean sunfish resting at the surface. No disturbance detected.
3	9/5/12	Mm	1	1	1	-	15:18	-	3	30.662	-79.827	029	0.92	-	400-500	No/No	Ocean sunfish resting at the surface. No disturbance detected.
4	9/5/12	Unid	3	3	3	-	15:37	15:42	3	30.612	-80.051	052	0.45	180	200-300	No/No	Group of unidentified dolphins traveling at 'medium' speed. No disturbance detected.
5	9/5/12	Cc	1	1	1	-	16:01	-	3	30.565	-80.535	038	0.66	-	30-40	No/No	Loggerhead turtle resting at the surface. No disturbance detected.
6	9/5/12	Sf	4	6	3	-	16:02	16:04	3	30.569	-80.494	044	0.57	220	30-40	No/No	Atlantic spotted dolphin group traveling at 'medium' speed. No disturbance detected.
7	9/5/12	Sf	7	7	6	-	16:07	16:12	3	30.560	-80.327	030	0.76	180	30-40	Yes/No	Atlantic spotted dolphin group engaging in 'surface active travel.' No disturbance detected.
8	9/5/12	Cc	1	1	1	-	16:16	16:17	3	30.565	-80.247	040	0.55	270	40-50	No/No	Loggerhead turtle resting at the surface. No disturbance detected.
9	9/5/12	Unid	5	7	3	-	16:30	-	2	30.569	-79.746	021	1.79	250	500-600	No/No	Group of unidentified dolphins traveling at 'medium' speed. No disturbance detected.



Sighting No.	Date	Species	Group Size Best/High/Low			Calves	Start Time	Stop Time	Beaufort Sea State	Latitude	Longitude	Vert. Angle	Distance off Track (km)	Heading	Bottom Depth (m)	Photos/Videos Taken	Behavioral Summary
<b>Pre-FIREX Sightings on 5 September 2012 (continued)</b>																	
10	9/5/12	Unid	1	1	1	-	16:39	16:41	3	30.518	-79.836	042	0.48	150	400-500	No/No	Unidentified dolphin traveling at 'slow' speed. No disturbance detected.
11	9/5/12	Cc	1	1	1	-	16:42	-	3	30.513	-79.909	026	0.8	130	400-500	No/No	Loggerhead turtle resting at the surface. No disturbance detected.
12	9/5/12	Tt	3	3	3	-	16:57	-	4	30.527	-80.442	042	0.73	180	30-40	No/No	Bottlenose dolphin group traveling at 'medium' speed. No disturbance detected.
13	9/5/12	Sf	12	15	10	-	16:59	17:08	4	30.529	-80.528	027	0.9	165	30-40	Yes/No	Atlantic spotted dolphin group engaging in probable foraging. No disturbance detected.
14	9/5/12	Unid ST	1	1	1	-	17:11	-	3	30.525	-80.597	035	0.68	170	30-40	No/No	Unidentified sea turtle resting at the surface. No disturbance detected.
<b>Pre-FIREX Sightings on 6 September 2012 – Morning</b>																	
1	9/6/12	Unid	2	2	2	-	11:34	-	4	30.525	-80.623	032	0.61	-	30-40	No/No	Unidentified dolphin traveling at 'medium' speed. No disturbance detected.
<b>Pre-FIREX Sightings on 6 September 2012 – Afternoon</b>																	
1	9/6/12	Sf	2	2	2	-	14:45	-	3	30.715	-79.908	042	0.47	270	300-400	No/No	Atlantic spotted dolphin group traveling at 'medium' speed. No disturbance detected.
2	9/6/12	Unid	1	1	1	-	14:59	-	3	30.716	-80.380	036	0.53	270	30-40	No/No	Unidentified dolphin traveling at 'medium' speed. No disturbance detected.

Sighting No.	Date	Species	Group Size Best/High/Low			Calves	Start Time	Stop Time	Beaufort Sea State	Latitude	Longitude	Vert. Angle	Distance off Track (km)	Heading	Bottom Depth (m)	Photos/Videos Taken	Behavioral Summary
<b>Pre-FIREX Sightings on 6 September 2012 – Afternoon (continued)</b>																	
3	9/6/12	Unid	1	1	1	-	15:04	-	2	30.718	-80.552	024	0.78	240	30-40	No/No	Unidentified dolphin traveling at 'fast' speed. No disturbance detected.
4	9/6/12	Unid	1	1	1	-	15:04	-	2	30.719	-80.565	054	0.4	090	30-40	No/No	Unidentified dolphin traveling at 'medium' speed. No disturbance detected.
5	9/6/12	Unid	5	8	4	-	15:11	-	2	30.662	-80.467	028	0.83	090	30-40	No/No	Group of unidentified dolphins traveling at 'fast' speed. No disturbance detected.
6	9/6/12	Unid	1	1	1	-	15:41	-	3	30.611	-79.824	022	0.83	105	400-500	No/No	Unidentified dolphin traveling at 'fast' speed. No disturbance detected.
7	9/6/12	Sf	23	35	18	1	15:55	16:19	3	30.621	-80.303	050	0.43	090	30-40	Yes/No	Atlantic spotted dolphin group traveling at 'medium' speed. Probable foraging at times. No disturbance detected. See <b>Appendix B</b> for focal-follow data.
8	9/6/12	Sf	4	5	4	-	16:40	-	3	30.563	-80.403	050	0.48	180	30-40	No/No	Atlantic spotted dolphin group traveling at 'medium' speed. No disturbance detected.
9	9/6/12	Gg	18	25	18	1	16:52	17:15	3	30.560	-79.963	056	0.48	180	300-400	Yes/Yes	Risso's dolphin group traveling at 'slow' speed. No disturbance detected. See <b>Appendix B</b> for focal-follow data.
10	9/6/12	Tt	3	3	3	-	17:40	-	3	30.518	-80.122	055	0.41	180	130-200	No/No	Bottlenose dolphin group traveling at 'slow' speed. No disturbance detected.

Sighting No.	Date	Species	Group Size Best/High/Low			Calves	Start Time	Stop Time	Beaufort Sea State	Latitude	Longitude	Vert. Angle	Distance off Track (km)	Heading	Bottom Depth (m)	Photos/Videos Taken	Behavioral Summary
<b>Pre-FIREX Sightings on 6 September 2012 – Afternoon (continued)</b>																	
11	9/6/12	Sf	1	1	1	-	17:51	-	3	30.516	-80.544	062	0.37	000	30-40	No/No	Atlantic spotted dolphin traveling at 'medium' speed. No disturbance detected.
<b>During-FIREX Sightings on 7 September 2012</b>																	
NO SIGHTINGS																	
<b>Post-FIREX Sightings on 8 September 2012</b>																	
1	9/8/12	Tt	1	1	1	-	11:21	-	4	30.521	-80.604	050	0.39	180	30-40	No/No	Bottlenose dolphin traveling at 'medium' speed. No disturbance detected.

Key:

- Cc = Loggerhead turtle (*Caretta caretta*)
- Sf = Atlantic spotted dolphin (*Stenella frontalis*)
- Tt = Bottlenose dolphin (*Tursiops truncatus*)
- Unid = Unidentified dolphin
- Unid ST = Unidentified sea turtle
- Mm = Ocean sunfish (*Mola mola*)

**Table 4. Summary of Sightings Recorded During Monitoring for JAX FIREX Training.**

Species	Number of Sightings	Bottom Depth (m)
Atlantic spotted dolphin	7	30-400
Bottlenose dolphin	3	30-200
Risso's dolphin	1	300-400
Unidentified dolphin	9	30-600
Loggerhead turtle*	4	30-500
Unidentified sea turtle*	1	30-40
Ocean sunfish	2	200-500

Note: \* Only a partial sea turtle count was made on 5 September and no attempts were made to document turtles on 6-8 September, since MMOs focused on marine mammal sightings and integrating new survey software as directed by the U.S. Navy.

## Behavior

No visible evidence of unusual behavior was observed for the pre-FIREX, during-FIREX, or post-FIREX surveys (see **Table 3**). The survey team conducted two focal follows during the pre-FIREX afternoon flight of 6 September. The first focal follow was a period of approximately 17 min spent with a group of 23 Atlantic spotted dolphins. Photographs were taken, but video was not obtained during the first focal follow event. The second focal follow was a period of approximately 16 min spent with a group of 18 Risso's dolphins. Photographs and video were both taken during the second focal follow event. Detailed behavioral observations made during the focal follow are presented in **Appendix B**.

## Section 4 Acknowledgements

We would like to thank Orion Aviation's Director Ed Coffman and pilots Dave Huddle and Josh Clayton. These data were obtained under National Marine Fisheries Service permit no. 14451 issued to Joseph R. Mobley, Jr.

## Section 5 References

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- Smultea et al. 2009      Smultea, M.A., J.R. Mobley, Jr., and K. Lomac-MacNair. 2009. *Aerial Survey Monitoring for Marine Mammals and Sea Turtles in Conjunction with US Navy Major Training Events off San Diego, California, 15-21 October and 15-18 November 2008, Final Report*. Prepared by Marine Mammal Research Consultants, Honolulu, HI, and Smultea Environmental Sciences, LLC.,

Issaquah, WA, under Contract No. N62742-08-P-1936 and N62742-08-P-1938  
for NAVFAC Pacific, EV2 Environmental Planning, Pearl Harbor, HI.

## APPENDIX A

### Environmental, Oceanographic, and Sighting Conditions

**Table A-1** shows the environmental, oceanographic, and sighting conditions encountered by Marine Mammal Observers (MMOs) during the pre-FIREX, during-FIREX, and post-FIREX monitoring efforts.

Time	Beaufort Sea State Left MMO	Glare Left MMO	Visibility Distance Left MMO (km)	Beaufort Sea State Right MMO	Glare Right MMO	Visibility Distance Right MMO (km)	Cloud Cover (%)
<b>Pre-FIREX Survey Effort on 5 September 2012</b>							
13:58	3	2	1.5	3	5	1	40
14:15	2	2	2	2	4	1.5	25
14:24	3	2	2	3	4	1.5	25
14:27	3	4	1	3	2	2	20
14:38	2	4	1	2	2	2	20
14:42	2	4	1	2	2	2	20
14:51	3	4	1	3	2	2	20
14:57	3	2	2.5	3	4	1	20
15:15	2	1	2.5	2	4	1	20
15:26	3	3	1	3	2	1	45
15:42	3	3	1	3	2	1	45
15:59	3	2	1.5	3	4	1	40
16:14	4	1	1.5	4	4	1	15
16:22	2	1	2.5	2	2	1	35
16:35	3	3	1	3	2	1.5	40
16:43	2	3	1.5	2	2	1.5	40
16:47	4	3	1	4	2	1	0
17:09	3	3	1	3	3	1	0
<b>Pre-FIREX Survey Effort on 6 September 2012 (Morning)</b>							
08:40	4	2	1.5	4	4	1	35
09:09	4	2	1	4	1	1	70
09:39	3	2	2	3	4	0.75	10
09:48	4	2	1.5	4	4	0.75	0
09:59	3	2	2	3	4	0.75	20
10:08	4	1	2	4	3	1	60
10:21	3	2	2	3	3	1	45

Time	Beaufort Sea State Left MMO	Glare Left MMO	Visibility Distance Left MMO (km)	Beaufort Sea State Right MMO	Glare Right MMO	Visibility Distance Right MMO (km)	Cloud Cover (%)
<b>Pre-FIREX Survey Effort on 6 September 2012 (Morning) (continued)</b>							
10:38	3	3	1.5	3	4	1	60
11:01	4	2	1.5	4	5	0.75	25
11:07	4	4	1	4	3	1	25
11:12	4	4	1	4	3	1	25
<b>Pre-FIREX Survey Effort on 6 September 2012 (Afternoon)</b>							
14:09	3	3	1.5	2	3	2	60
14:37	3	5	1	3	1	3	60
14:50	3	5	1	3	2	2	75
15:03	2	5	1	2	1	3	70
15:08	2	3	1	2	3	3	10
15:19	3	3	1.5	3	3	1.5	25
15:36	3	3	1	3	2	2	50
16:24	3	3	1	3	2	2	20
16:34	3	2	1.5	3	2	2	0
16:49	3	1	1.5	2	1	3	0
17:16	2	2	2	2	2	2	5
17:19	2	3	1.5	2	2	2	5
17:27	3	4	0.5	3	1	2	5
<b>During-FIREX Survey Effort on 7 September 2012</b>							
08:43	3	3	1	3	2	1.5	10
08:46	4	3	1	4	2	1	10
09:07	3	3	1	3	2	1.5	80
09:12	3	3	1	3	2	2	80
09:34	4	3	1	4	2	1	30
09:42	4	3	1.5	4	3	1.5	20
10:11	4	3	1	4	0	3	50
<b>Post-FIREX Survey Effort on 8 September 2012</b>							
08:31	3	2	1.5	3	3	1.5	35
08:34	4	2	1.5	3	3	1.5	35
08:59	4	1	2	4	3	1	30
09:22	5	2	1	5	3	1	10
09:30	4	2	1.5	4	4	1	50
09:40	5	3	1	5	4	1	50
09:46	4	3	1	4	4	1	30

Time	Beaufort Sea State Left MMO	Glare Left MMO	Visibility Distance Left MMO (km)	Beaufort Sea State Right MMO	Glare Right MMO	Visibility Distance Right MMO (km)	Cloud Cover (%)
<b>Post-FIREX Survey Effort on 8 September 2012 (continued)</b>							
09:52	5	3	1	5	4	1	35
09:58	4	3	1	4	3	1	40
10:20	5	3	1	5	3	1	15
10:28	5	3	1	5	4	1	35
10:42	4	3	1.5	4	4	1	5
10:55	4	3	1	4	3	1	15
10:59	4	4	1	4	3	1	10

Values for Glare (0-5) are as follow:

- 0= 0%
- 1= 1-19%
- 2= 20-39%
- 3= 40-59%
- 4= 60-79%
- 5= 80-100%



## APPENDIX B

### Focal-Follow Data

**Table B-1** shows the focal-follow behavioral data from the JAX FIREX with IMPASS training 2012 monitoring efforts. Two focal-follow events were conducted during Pre-FIREX surveys on 6 September 2012—one group of Atlantic spotted dolphins and one group of Risso's dolphins, both within the survey area.

Record Number	Time	Date	Latitude	Longitude	Recorded Behavior
<b>Sighting Number 7</b>					
Species: <i>Stenella frontalis</i> . Group size: 23					
1	16:02:37	9/6/2012	30.621	-80.303	Medium travel heading 270°. Minimum Dispersal = 3, Maximum (Max) Dispersal = 6. First of two subgroups.
2	16:03:43	9/6/2012			Medium travel heading 270°. Minimum Dispersal = 3, Max Dispersal = 6.
3	16:04:38	9/6/2012			Medium travel heading 270°. Minimum Dispersal = 3, Max Dispersal = 6. Sea turtle present.
4	16:05:54	9/6/2012			Medium travel heading 270°. Minimum Dispersal = 3, Max Dispersal = 6.
5	16:07:25	9/6/2012			Medium travel heading 270°. Minimum Dispersal = 3, Max Dispersal = 6.
6	16:08:00	9/6/2012			Medium travel heading 270°. Minimum Dispersal = 3, Max Dispersal = 6.
7	16:09:19	9/6/2012			Medium travel heading 270°. Minimum Dispersal = 3, Max Dispersal = 6.
8	16:10:19	9/6/2012			Surface active mill. A few individuals are engaging in probable foraging. Heading 270°. Minimum Dispersal = 2, Max Dispersal = 4.
9	16:11:19	9/6/2012			Surface active travel heading 300°. Minimum Dispersal = 2, Max Dispersal = 4.
10	16:12:11	9/6/2012			Surface active travel heading 300°. Minimum Dispersal = 1, Max Dispersal = 4. This observation is of the second of the two subgroups. Groups separated by ~50 meters.
11	16:13:26	9/6/2012			Probable foraging with overall heading 300°. Minimum Dispersal = 1, Max Dispersal = 4. Both groups have now merged.

Record Number	Time	Date	Latitude	Longitude	Recorded Behavior
<b>Sighting Number 7 (continued)</b>					
12	16:15:03	9/6/2012			Probable foraging with heading 300°. Minimum Dispersal = 1, Max Dispersal = 25.
13	16:16:06	9/6/2012			Surface active travel with heading 015°. Minimum Dispersal = 1, Max Dispersal = 4.
14	16:18:09	9/6/2012			Probable foraging with heading 015°. Minimum Dispersal = 1, Max Dispersal = 8. Two subgroups have emerged once again.
15	16:19:11	9/6/2012			Probable foraging with heading 015°. Minimum Dispersal = 1, Max Dispersal = 8. At least one calf was observed.
<b>Sighting Number 9</b>					
Species: <i>Grampus griseus</i> . Group size: 18					
1	16:59:27	9/6/2012	30.560	-79.963	Slow travel heading 180°. Minimum Dispersal = 1, Max Dispersal = 7. Group structure is tightly clumped.
2	17:01:01	9/6/2012			Slow travel heading 180°. No dispersal information. Tight group.
3	17:02:25	9/6/2012			Subsurface slow travel heading 180°. Minimum Dispersal = 0.5, Max Dispersal = 2. Tight group.
4	17:04:17	9/6/2012			Subsurface slow travel heading 180°. Minimum Dispersal = 0.5, Max Dispersal = 2. Tight group.
5	17:05:33	9/6/2012			Slow travel heading 180°. Minimum Dispersal = 0.5, Max Dispersal = 2.
6	17:07:14	9/6/2012			Slow travel heading 180°. Minimum Dispersal = 0.5, Max Dispersal = 2.
7	17:09:26	9/6/2012			Slow travel heading 180°. Minimum Dispersal = 0, Max Dispersal = 3.
8	17:10:34	9/6/2012			Slow travel heading 180°. Minimum Dispersal = 0, Max Dispersal = 3.
9	17:12:00	9/6/2012			Subsurface slow travel heading 180°. Minimum Dispersal = 0, Max Dispersal = 4.
10	17:13:46	9/6/2012			Slow travel heading 180°. Minimum Dispersal = 0, Max Dispersal = 4.

Record Number	Time	Date	Latitude	Longitude	Recorded Behavior
<b>Sighting Number 9 (continued)</b>					
11	17:15:03	9/6/2012			Slow travel heading 180°. Minimum Dispersal = 0, Max Dispersal = 4.
12	17:15:21	9/6/2012			Slow travel heading 180°. Minimum Dispersal = 0.5, Max Dispersal = 7.

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