FINAL REPORT TO
GEORGIA DEPARTMENT OF NATURAL RESOURCES

NORTHERN EARLY WARNING SYSTEM
NORTH ATLANTIC RIGHT WHALE (*Eubalaena glacialis)*
AERIAL SURVEYS, 2007-2008 SEASON

September 10, 2008

Submitted by:

WILDLIFE TRUST
AQUATIC CONSERVATION PROGRAM

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Summary

The 2007-2008 Northern Early Warning System (NEWS) surveys were flown by the Wildlife Trust survey team from December 1, 2007 to March 28, 2008. The NEWS survey area extended from the northern end of Sapelo Island, GA to mid Cumberland Island, GA, out to approximately 32 nautical miles (NM) offshore. A total of 46 NEWS surveys were conducted, logging 261.0 hours of hobbs time and averaging 5.7 hours per survey. Overall, 17,469.0 NM of trackline were flown, with 13,653.5 NM (78%) of this total flown in a Beaufort sea state of 3 or less. The complete survey area (442.8 NM of trackline) was covered during 28 of the NEWS surveys, while the survey area was only partially covered during 18 of the flights.

A total of 168 right whale sightings were documented within the NEWS survey area, averaging 2.5 whales per sighting (range = 1-8). Sixty-three sightings consisted of cow/calf pairs, 29 were of single animals, 29 were of pairs of two right whales, and the remaining 47 sighting events were of groups of three to eight right whales. Preliminary photo analysis resulted in the identification of 17 individual cow/calf pairs in the NEWS survey area, with 38 percent of all sightings involving cow/calf pairs (n = 63). An additional 112 individual adult/juvenile whales were observed during the NEWS surveys. Ninety of these 146 individual whales have been initially identified from the North Atlantic Right Whale Catalog. Thirty-nine individual whales do not have a preliminary identification at this time and have been assigned intermatch codes to assist in the initial matching process. The remaining 17 individual whales are calves born in the 2007-2008 season. The overall number of right whale sightings in the 2007-2008 season represents an increase of 57% and 35% over the 2005-06 and 2006-07 seasons, respectively. The number of individual right whales sighted in the 2007-2008 NEWS season represents an increase of 37% and 40% over the 2005-06 and 2006-07 seasons, respectively. Preliminary comparisons of the whales sighted in the different southeastern United States survey areas indicate that 25 right whales may have only been sighted in the NEWS survey area during the 2007-2008 season. Additionally, two entangled right whales (EGNOs 3333 and 3346) were documented and two of the season's calving females (EGNOs 1301 and 3180) are believed to have lost their 2008 calves after being sighted without their newborn calves during the NEWS surveys.

Right whale sightings for the entire 2007-2008 season were well distributed throughout the NEWS survey area. Many of the right whales observed in the NEWS survey area were resighted on multiple occasions, including 88% of cow/calf pairs resighted at least once (range = 1-12 resights). EGNO 1408 was resighted the most during the surveys. This calving female was observed once before giving birth to her 2008 calf and then twelve times with her 2008 calf.

The Wildlife Trust survey team also recorded vessel and marine animal sightings during the NEWS surveys, including 109 leatherback turtles. No humpback whales or dead right whales were observed during the NEWS surveys. One whale/vessel interaction ("close call") involving two vessels and ten right whales was observed during the 2007-2008 NEWS season.

Introduction

The North Atlantic right whale (*Eubalaena glacialis*) is protected in U.S and territorial waters pursuant to the Marine Mammal Protection Act of 1972, and is classified as an endangered species under the Endangered Species Act of 1973. The only known calving ground for the North Atlantic right whale consists of Atlantic coastal waters in the southeastern United States (SEUS). The area designated as the Southeastern United States Critical Habitat by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) in 1994 encompasses the waters from Altamaha Sound, Georgia to Sebastian Inlet, Florida out to 5-15 NM from the shoreline (50 CFR 226.203). Minimizing sources of human-caused death, injury and disturbance is a primary objective of the North Atlantic Right Whale (*Eubalaena glacialis*) Recovery Plan (National Marine Fisheries Service, 2005). One of the two primary human-caused threats to right whale survival is ship collisions. The SEUS calving ground critical habitat includes entrances to four shipping channels (Brunswick, GA; Fernandina, FL; Jacksonville, FL; Canaveral, FL), resulting in frequent usage of these waters by large commercial and military vessels. The Early Warning System (EWS) was created in 1994 to alert military and commercial vessels of the presence of right whales, thereby reducing the probability of right whale/vessel collisions. The initial EWS surveys covered areas of high whale density along the coastline from Brunswick, GA to St. Augustine, FL. Data collected subsequently indicated that right whales regularly utilize waters outside of the initial EWS study area. In 2002, NOAA Fisheries redesigned the EWS system to include three survey areas (northern, central and southern) that replaced and expanded upon the original single EWS survey area. The redesigned EWS surveys were modified to cover the waters from mid Sapelo Island, GA to the southern end of St. Augustine Beach, FL. The survey effort described in this report covers the area from the northern end of Sapelo Island, GA to mid Cumberland Island, GA, referred to as the Northern Early Warning System (NEWS).

The objectives of the 2007-2008 NEWS surveys were to implement actions of the North Atlantic Right Whale Recovery Plan, including: 1) reduce ship collisions with right whales; 2) document and provide support for right whale disentanglement; 3) document dead and stranded right whales; 4) monitor the status and trends of abundance and distribution of the western North Atlantic right whale; and 5) characterize and monitor right whale habitat. This report examines the results of the Wildlife Trust (WT) aerial survey efforts while attempting to fulfill these objectives within the Northern Early Warning System survey area for the 2007-2008 calving season.

Methods

Study Area

The Northern Early Warning System survey season began on December 1, 2007 and concluded on March 31, 2008. The NEWS survey area for the 2007-2008 season extended from the northern end of Sapelo Island, GA to mid Cumberland Island, GA, and out to approximately 32 NM offshore. Fourteen east/west transect lines of varied lengths (28.8 – 32.4 NM) were flown at 3 NM intervals (Figure 1). A complete survey consisted of 442.8 NM of trackline (Table 1), not including miles flown in transit to, from, and between transect lines. Without whale sightings, a complete survey took approximately 5.5 hours to finish. On occasion the survey aircraft was unavailable due to scheduled maintenance or pilot down-time. On those days, a two-plane contingency plan was implemented, during which survey aircraft from the New England Aquarium (NEAq) Central Early Warning System and the Florida Fish and Wildlife Research Institute (FWRI) Southern Early Warning System shifted their survey coverage north to include much of the NEWS survey area.

Aerial Surveys

Surveys were scheduled to be flown daily from December 1, 2007 through March 31, 2008, weather permitting and under VFR (visual flight rules) conditions. During each normal survey day, the survey

aircraft departed from Malcolm McKinnon airport on St. Simons Island, GA and returned to the same airfield. All of the NEWS surveys were conducted in a NOAA owned and operated DeHaviland Twin Otter aircraft. The survey aircraft was equipped with Global Positioning System navigation aids, radar, aviation VHF radio, marine VHF radio, a life raft, PFDs, survival suits, flares, EPIRB, an aircraft ELT

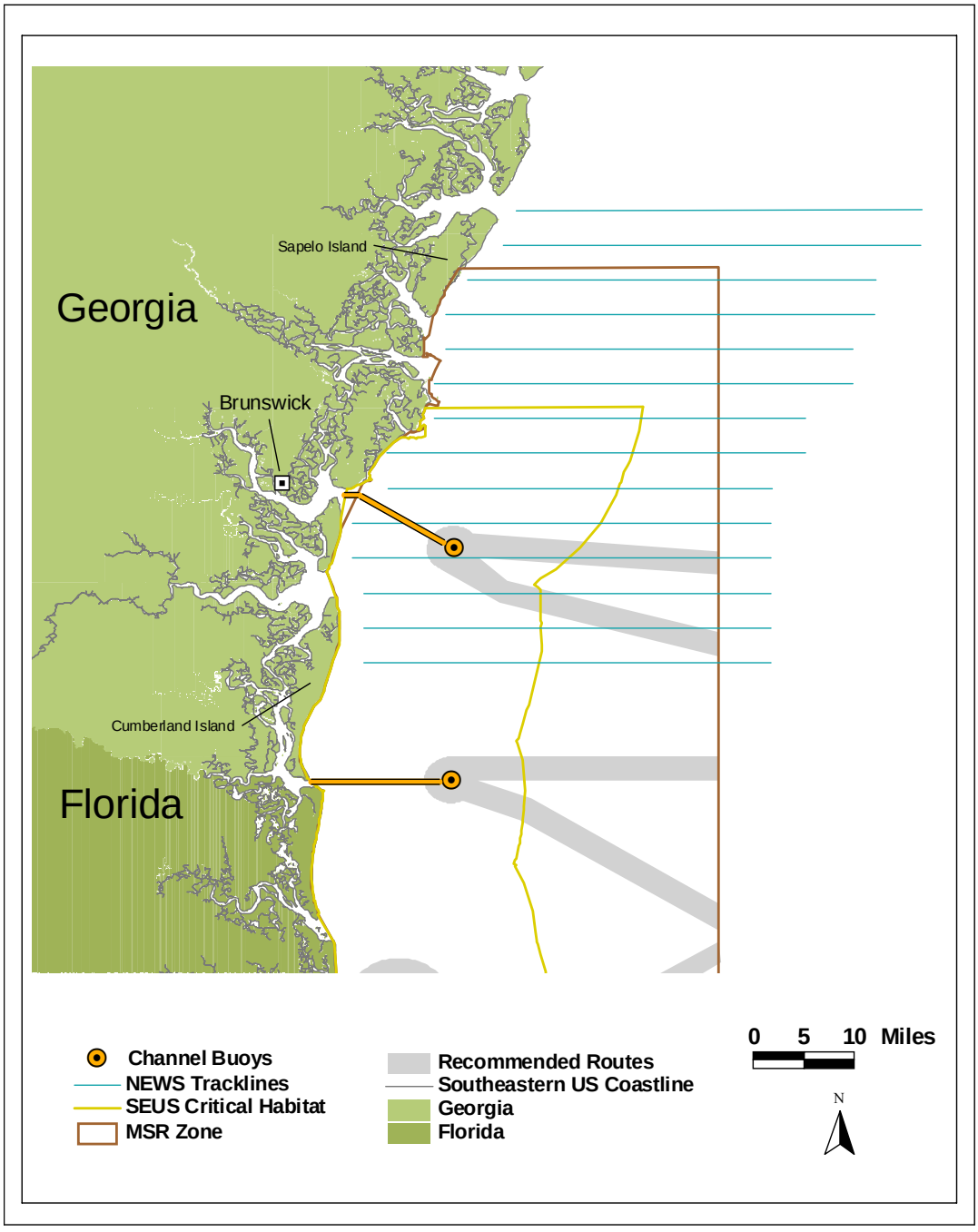

Figure 1: Map of the 14 Northern Early Warning System (NEWS) survey tracklines including the Southeastern United States (SEUS) Critical Habitat and Mandatory Ship Reporting (MSR) zone.

Table 1: Northern Early Warning System (NEWS) survey transects for the 2007-2008 Season.

Transect Number	Length (NM)	Western Waypoint		Eastern Waypoint	
1	31.5	30° 53 N	81° 22 W	30° 53 N	80° 47 W
2	31.5	30° 56 N	81° 22 W	30° 56 N	80° 47 W
3	31.5	30° 59 N	81° 22 W	30° 59 N	80° 47 W
4	32.4	31° 02 N	81° 23 W	31° 02 N	80° 47 W
5	32.4	31° 05 N	81° 23 W	31° 05 N	80° 47 W
6	29.7	31° 08 N	81° 20 W	31° 08 N	80° 47 W
7	32.4	31° 11 N	81° 20 W	31° 11 N	80° 44 W
8	28.8	31° 14 N	81° 16 W	31° 14 N	80° 44 W
9	32.4	31° 17 N	81° 16 W	31° 17 N	80° 40 W
10	31.5	31° 20 N	81° 15 W	31° 20 N	80° 40 W
11	33.3	31° 23 N	81° 15 W	31° 23 N	80° 38 W
12	31.5	31° 26 N	81° 13 W	31° 26 N	80° 38 W
13	32.4	31° 29 N	81° 10 W	31° 29 N	80° 34 W
14	31.5	31° 32 N	81° 09 W	31° 32 N	80° 34 W
Total NM	**442.8**				

and a satellite telephone. Additionally, individually registered GPIRBs, knives, streamers, and strobes were issued to observers. Flight protocols also included mandatory use of PFDs and Nomex flight suits on all flights. All observers were required to complete emergency egress training prior to the start of the survey season.

The NEWS surveys were flown at an altitude of 1000 ft (303 m) and at a ground speed of 100 knots. The surveys typically began at the western waypoint of the northernmost trackline, line 14, and flown north to south. However, the start point and direction of flight was determined daily based on weather conditions in the survey area and other survey factors. The optimal environmental conditions for a survey flight included a minimum ceiling of 455m, visibility greater than 2 NM, wind speed less than 10 knots and Beaufort sea state of 3 or less.

The survey crew consisted of a pilot and co-pilot, two observers, data recorder and a photographer. The survey team rotated between the two observer positions and photographer position every four tracklines throughout the duration of the survey. Observers were positioned on either side of the aircraft at the forward bubble windows and sightings of marine animals were reported to the data recorder. The data recorder did not rotate and used a laptop computer to log all sightings into Logger 2000, a software program designed for marine survey data entry. The time, location, number and species of all large whales, leatherback turtles and manatees were recorded. In addition, all types of vessels observed in the survey area were recorded. Sighting angles for all large vessels of 100 feet or greater in length were recorded using a digital inclinometer. The type and heading of all large vessels were also documented.

When a right whale was observed, a GPS position was recorded along the trackline at the point of observation. The survey aircraft then broke track and flew directly over the right whale to obtain an exact GPS location. The aircraft also circled over each right whale encountered to obtain digital photographs and document behaviors. After the right whales were fully documented, a final overhead location of the whales was recorded and the aircraft returned to the trackline at the point of departure to continue the survey. Circling for photographic documentation was generally limited to 15 minutes for each sighting. During emergency situations (e.g. whale entanglements), time spent obtaining photographs was extended past the 15-minute limit.

Determination of Sighting Distance from the Trackline for Right Whales
Sighting distance from the trackline for observed right whales was calculated whenever possible, using the lat/long position on the trackline perpendicular to the position of the whale sighting (lat_1, $long_1$), and the lat/long exact overhead position of the right whale (lat_2, $long_2$). The whale's distance in NM from the trackline was determined by subtracting the distance between the two latitude positions, as 1 minute of latitude=1 NM in the study area (Figure 2).

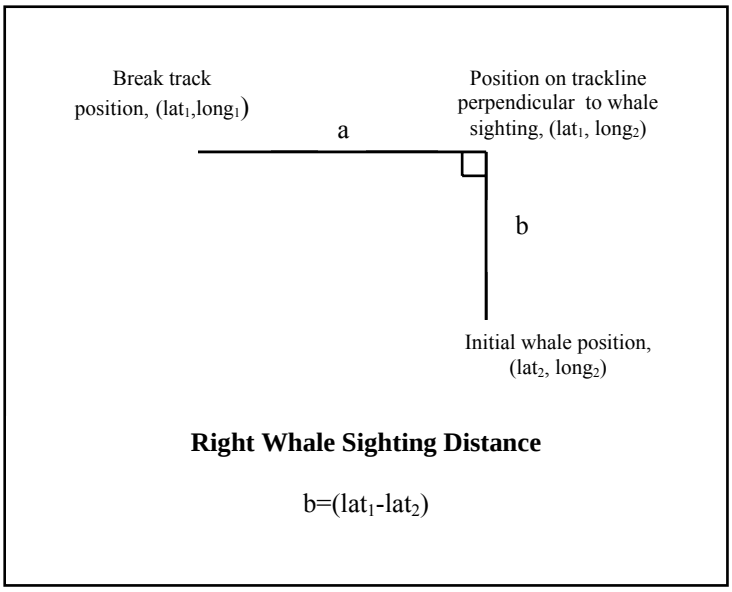

Figure 2: Diagram of method for determining sighting distances for right whales.

Notification of Right Whale Sighting Information
Upon completing data collection for each right whale sighting, the aircraft immediately relayed right whale sighting information to a designated ground contact via satellite phone. The ground contact then distributed the right whale sighting information to various maritime, military and non-military interests in the SEUS via email. The right whale sighting email included distance and direction of the sighting from the closest channel sea buoy, source of the right whale sighting, date, time, latitude and longitude, direction of movement, age class and number of right whales sighted. Sighting information was received by users via email, cell phone text or an established alphanumeric pager system (Taylor and Brooks, 2002). Users of right whale sighting data included right whale aerial survey teams, ship channel pilots, USCG NAVTEX, state agencies and the Fleet Area Control and Surveillance Facility (FACSFACJAX) at Naval Air Station Jacksonville. FACSFACJAX has the capability to contact all military ships and aircraft in the southeastern United States almost instantaneously with right whale sighting information. This near real-time notification of right whale sightings to various SEUS entities was established to minimize the probability of right whale death or injury due to ship strike. It also allowed aerial survey teams to investigate and verify sightings reported from other sources such as the Coast Guard, military ships, private watercraft, dredges and other aircraft.

Right whale sightings within the NEWS survey area were also entered into the Mandatory Ship Reporting (MSR) system and relayed to dredges operating within 15 NM of the sighting. Additionally, if the right whale sighting was within 5 NM of the Brunswick channel, the Brunswick harbor pilots were contacted directly with the sighting information.

Documentation of Whale/Vessel Interactions
Due to the negative impact of ship collisions and other anthropogenic activities on the North Atlantic right whale (National Marine Fisheries Service, 2005), the Wildlife Trust survey team documented any incident in which a vessel was observed heading directly towards or approaching within a close proximity to right whales. The survey team suspended the normal survey to document the location, number, heading and behavior of the whales involved in the episode. The location, name, type, length, speed and heading of each of the vessels involved were also recorded throughout the event. Observations of the incident were documented until the vessels were no longer in the same vicinity as the right whales. Photographic and video documentation were taken whenever possible. Also, attempts were made to contact the vessels over VHF to make them aware of the presence and location of the right whales. All the information collected for each whale/vessel interaction was entered into an Access database and then submitted as detailed report forms to NOAA Fisheries, the Georgia Department of Natural Resources (GA DNR) and FWRI. Appendix 1 contains all the 2007-2008 NEWS whale/vessel interaction report forms.

Photographic Identification
Right whales are individually identified by the patterns of cornified skin primarily located on the top of the head between the tip of the rostrum and the blowhole (Payne *et al.*, 1983; Kraus *et al.*, 1986). Photographs of these right whale callosity patterns and other features, including scars, are used for identification and the cataloging of individual right whales. Right whales observed during the NEWS aerial surveys were photographed and sketched in order to identify individual animals using these unique patterns and features.

During a right whale sighting, the left-side observer recorded whale behaviors and sketched the callosity patterns and body scarring of the whales being observed. The right-side observer shifted to the left side of the plane and assisted in observing the whales' behaviors. The crewmember in the photographer position removed the window next to the left rear seat. The survey aircraft circled at an altitude of 1000 ft (303m) while animals were photographed through the open side window. Photographs were taken of whales using a Canon 10D digital camera with a Canon 100-400 mm image stabilized lens. All the photographs obtained during the 2007-2008 NEWS survey season were compared against each other, right whale images from other SEUS aerial survey teams and the New England Aquarium's catalog of North Atlantic right whales in order to determine the probable identity and resights of each individual whale encountered. This preliminary photo analysis by the Wildlife Trust team and initial identification verification by the NEAq has been completed. However, all right whale identifications listed within this report should be considered unverified until NEAq has analyzed all photographs from the 2007-2008 SEUS calving season. This final comparison and confirmation process by NEAq is now underway and will most likely be completed sometime in 2009 or 2010. Thus, all identification results within this report should be viewed as preliminary and subject to change.

Results

Surveys
A total of 46 NEWS surveys were flown from December 1, 2007 to March 28, 2008 (Table 2). A total of 261.0 hours of hobbs time was logged for the NEWS surveys, averaging 5.7 hours of hobbs time per survey. Overall, 17,469.0 NM of trackline were flown, with 13,653.5 NM (78%) of this total flown in a sea state of 3 or less. The complete survey area (442.8 NM of trackline) was covered during 28 of the NEWS surveys. On 18 of the NEWS flights, the survey area was partially covered due to factors such as inclement weather or special events (Table 2). Days with no survey effort in the NEWS survey area were mainly due to unacceptable weather conditions. Available NEWS flight hours were expended by March 28, 2008, therefore the two-plane contingency was available to provide coverage from March 29-31.

Other factors occasionally contributing to no fly days were the need to conserve and extend flight hours throughout the survey season, required rest for survey pilots after six days of duty and aircraft related reasons, such as required 100-hour plane maintenance (Table 3).

Table 2: NEWS right whale surveys conducted from 01 December 2007 through 28 March 2008.

Date	Survey Name	Complete Surveys	Partial Surveys	Survey Hobbs Time	Total trackline nmiles flown	Trackline nmiles flown in Beaufort SS ≤ 3	Number of Whales Seen
02-Dec-07	NEWS20071202	1		5.9	442.8	421.2	0
09-Dec-07	NEWS20071209	1		6.5	442.8	313.7	4
10-Dec-07	NEWS20071210		1	5.4	257.8	257.8	3
11-Dec-07	NEWS20071211		1	2.8	187.2	187.2	0
14-Dec-07	NEWS20071214	1		5.7	442.8	442.8	0
18-Dec-07	NEWS20071218	1		6.5	442.8	244.8	4
19-Dec-07	NEWS20071219	1		5.8	442.8	442.8	1
20-Dec-07	NEWS20071220	1		5.9	442.8	383.6	6
23-Dec-07	NEWS20071223		1	3.6	250.2	194.7	3
27-Dec-07	NEWS20071227		1	5.0	314.1	314.1	9
28-Dec-07	NEWS20071228		1	3.8	253.8	253.8	8
31-Dec-07	NEWS20071231		1	2.8	167.5	51.0	0
06-Jan-08	NEWS20080106		1	4.4	314.1	314.1	10
07-Jan-08	NEWS20080107		1	6.2	378.9	348.8	17
08-Jan-08	NEWS20080108		1	4.3	253.8	253.8	13
09-Jan-08	NEWS20080109		1	6.6	379.8	379.8	27
10-Jan-08	NEWS20080110	1		7.0	442.8	442.8	20
14-Jan-08	NEWS20080114		1	3.2	144.0	10.8	8
15-Jan-08	NEWS20080115		1	2.9	148.3	19.2	0
24-Jan-08	NEWS20080124	1		6.3	442.8	291.9	7
29-Jan-08	NEWS20080129	1		5.8	442.8	353.7	2
31-Jan-08	NEWS20080131		1	5.9	400.0	64.9	16
02-Feb-08	NEWS20080202		1	7.9	333.9	69.9	25
07-Feb-08	NEWS20080207	1		7.0	442.8	351.0	12
08-Feb-08	NEWS20080208	1		6.4	442.8	377.5	9
09-Feb-08	NEWS20080209	1		6.3	442.8	269.0	5
11-Feb-08	NEWS20080211		1	4.0	251.1	6.2	6
12-Feb-08	NEWS20080212	1		5.5	442.8	406.5	2
14-Feb-08	NEWS20080214	1		6.5	442.8	434.1	15
15-Feb-08	NEWS20080215	1		6.5	442.8	349.6	13
16-Feb-08	NEWS20080216	1		8.0	442.8	442.8	32
20-Feb-08	NEWS20080220	1		7.5	442.8	391.4	20
21-Feb-08	NEWS20080221		1	6.3	326.0	306.4	18
24-Feb-08	NEWS20080224	1		6.3	442.8	442.8	21
29-Feb-08	NEWS20080229	1		7.2	442.8	287.2	15
01-Mar-08	NEWS20080301		1	5.5	409.1	225.0	9

Date	Survey Name	Complete Surveys	Partial Surveys	Survey Hobbs Time	Total trackline nmiles flown	Trackline nmiles flown in Beaufort SS ≤ 3	Number of Whales Seen
02-Mar-08	NEWS20080302	1		6.5	442.8	407.8	18
06-Mar-08	NEWS20080306	1		6.3	442.8	291.8	11
10-Mar-08	NEWS20080310	1		5.7	442.8	10.3	2
11-Mar-08	NEWS20080311	1		6.2	442.8	442.8	7
13-Mar-08	NEWS20080313	1		5.7	442.8	442.8	2
21-Mar-08	NEWS20080321		1	3.9	301.0	0.0	0
22-Mar-08	NEWS20080322	1		6.1	442.8	383.0	2
26-Mar-08	NEWS20080326	1		5.5	442.8	442.8	2
27-Mar-08	NEWS20080327	1		5.7	442.8	442.8	3
28-Mar-08	NEWS20080328	1		6.2	442.8	442.8	7
Total	**46 Surveys**	**28**	**18**	**261.0**	**17469.0**	**13653.5**	**414**

Table 3: Non-weather related reasons for surveys not flown by the NEWS team during the 2007-2008 calving season.

Date	Fly-able Day	Survey Attempted by WT	Two-Plane Contingency Coverage	Non-weather related Reasons for Partial or No Survey by Wildlife Trust Survey Team
12-Dec-07	Y	N	N	Required Pilot Downtime due to 6 Day Rule
01-Jan-08	N	N	N	Required Pilot Downtime due to 6 Day Rule
16-Jan-08	N	N	N	100 hr. Maintenance on NOAA46
17-Jan-08	N	N	N	100 hr. Maintenance on NOAA46
18-Jan-08	N	N	N	100 hr. Maintenance on NOAA46
19-Jan-08	N	N	N	100 hr. Maintenance on NOAA46
20-Jan-08	N	N	N	100 hr. Maintenance on NOAA46
21-Jan-08	N	N	N	100 hr. Maintenance on NOAA46
22-Jan-08	Y	N	Y	100 hr. Maintenance on NOAA46
23-Jan-08	N	N	N	100 hr. Maintenance on NOAA46
17-Feb-08	Y	N	N	Required Pilot Downtime due to 6 Day Rule
25-Feb-08	Y	N	Y	100 hr. Maintenance on NOAA46
26-Feb-08	N	N	N	100 hr. Maintenance on NOAA46
29-Mar-08	Y	N	Y	No Remaining Survey Flight Hours
30-Mar-08	N	N	N	No Remaining Survey Flight Hours
31-Mar-08	N	N	N	No Remaining Survey Flight Hours

Survey effort within the NEWS area varied due mainly to sea state conditions. Figure 3 depicts the overall 2007-2008 NEWS survey effort indicated by the number times tracklines were flown during the 46 NEWS surveys. Sections of trackline flown the most during the season (n = 46) are represented in darker shades of grey, while sections flown the least (n = 31 to 35) are shown in lighter shades. The areas flown most frequently generally coincide with the region immediately surrounding the Brunswick

channel. The survey team attempted to fly these southern tracklines each survey day because of the high vessel traffic associated with the Brunswick channel and the recommended shipping routes extending to the east.

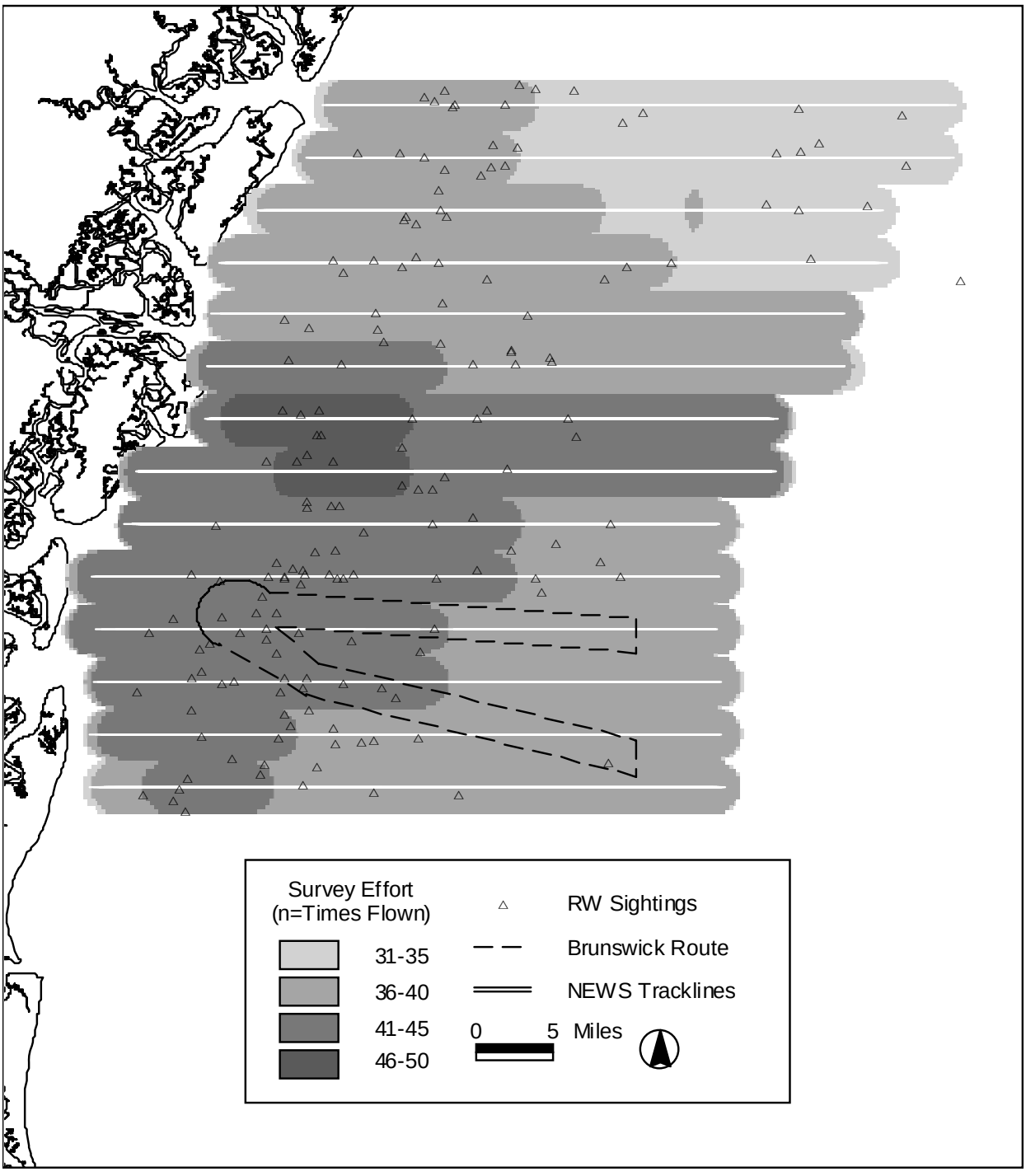

Figure 3: NEWS survey effort and right whale sightings from 01 December 2007 to 28 March 2008 (n = 46).

Figure 3 also shows that the eastern halves of the four northern tracklines were the least flown sections of the NEWS survey zone. This resulted from high sea states or delayed take-offs due to fog. The eastern half of almost all of the survey tracklines were flown less than the western half of the tracklines due to high sea states further offshore. By attempting to fly surveys only on days with a sea state 3 or less, the number of tracklines cut short due to high sea state was reduced in comparison to previous survey seasons.

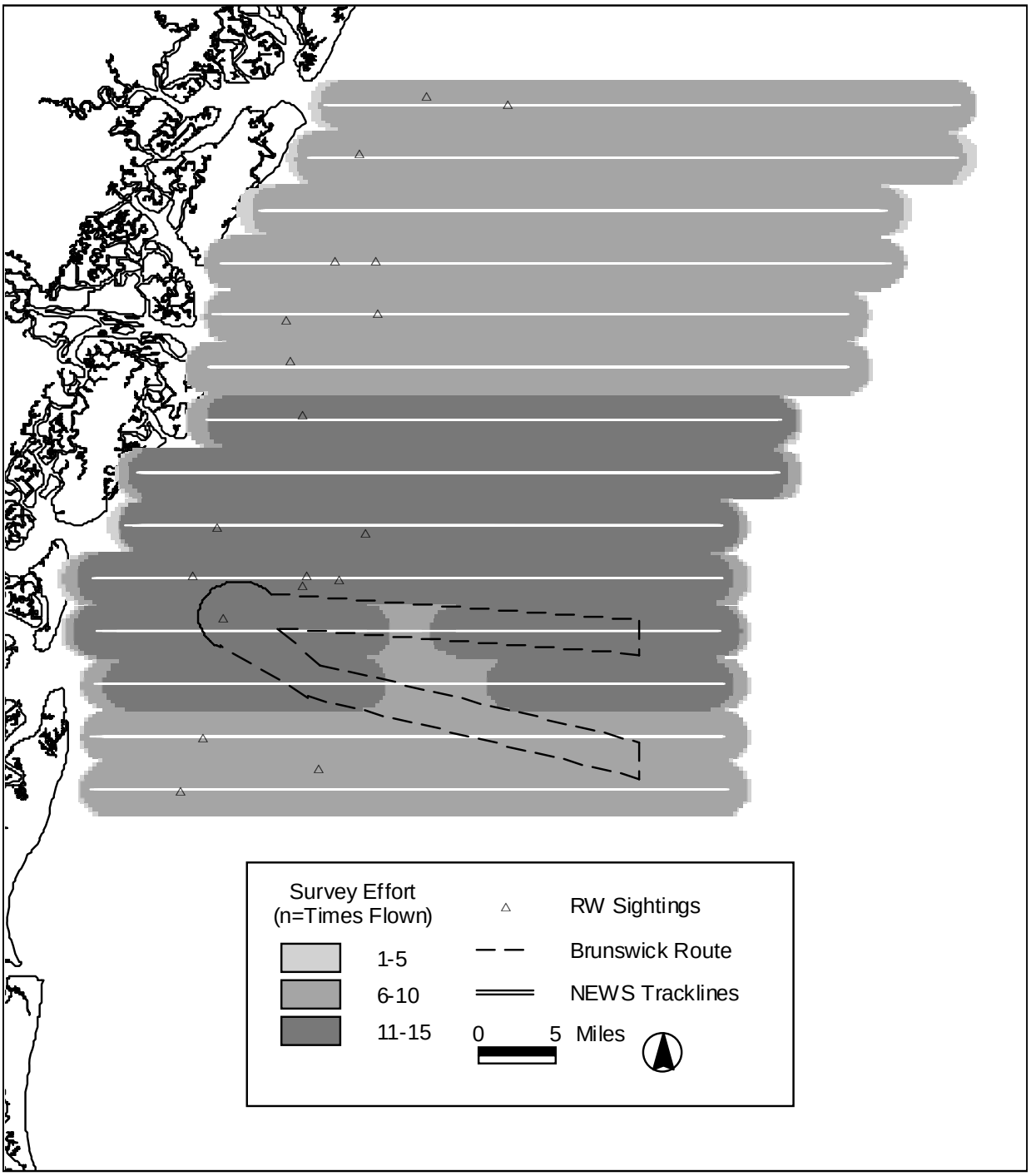

Figure 4: NEWS survey effort and right whale sightings during December 2007 (12 surveys flown).

Figures 4-7 depict the NEWS survey effort monthly throughout the season. Across months, the number of surveys was fairly consistent, averaging 11.5 (n=4, range = 11-13), however the number of nautical miles flown varied (December = 3,531.9 NM; January = 2,479.8 NM; February = 4,134.4; March = 3,531.9). Within each month, the survey coverage was generally even across the NEWS area, with variations occurring in December and January due to extensive fog and high sea states resulting in truncated tracklines.

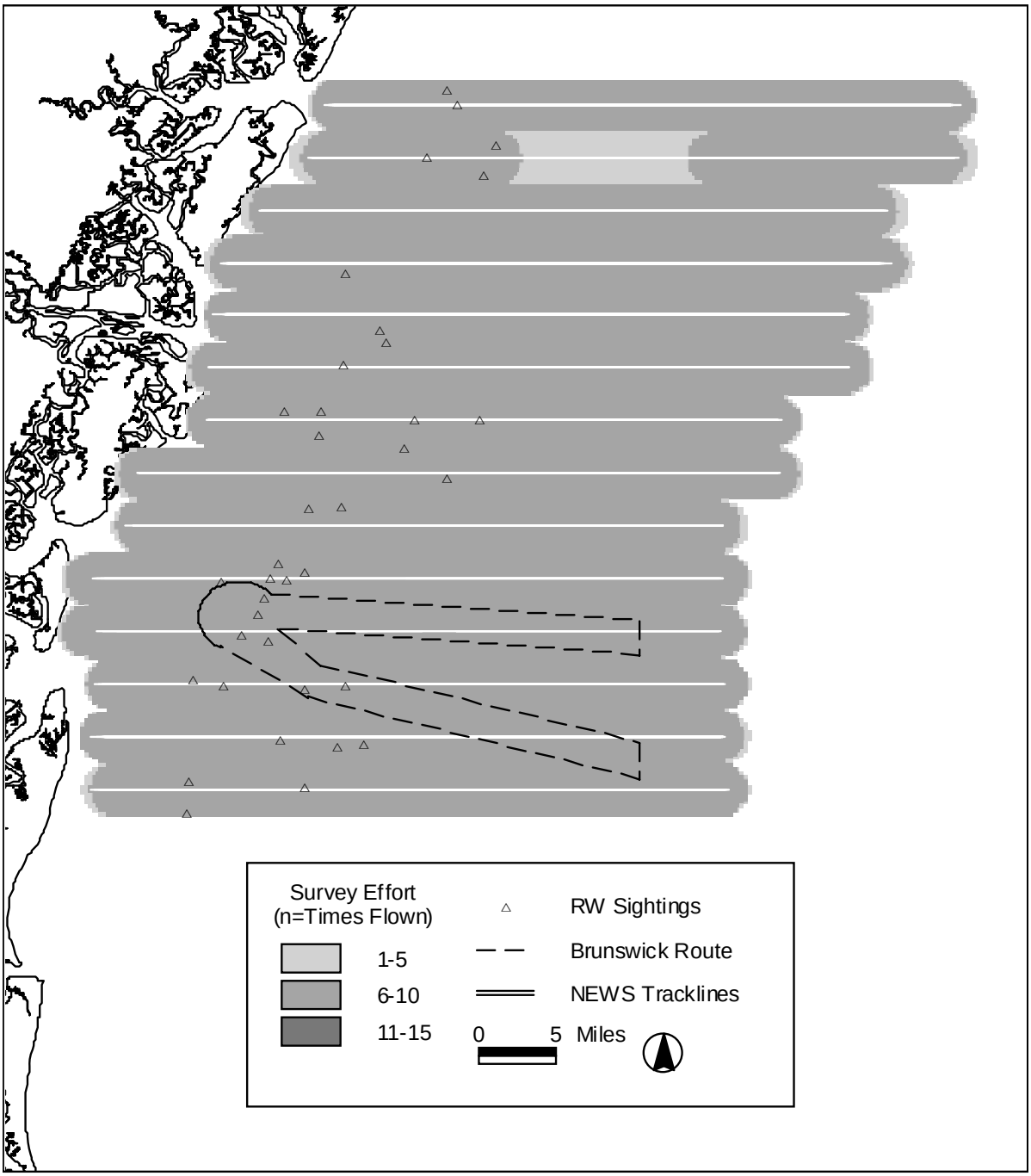

Figure 5: NEWS survey effort and right whale sightings during January 2008 (10 surveys flown).

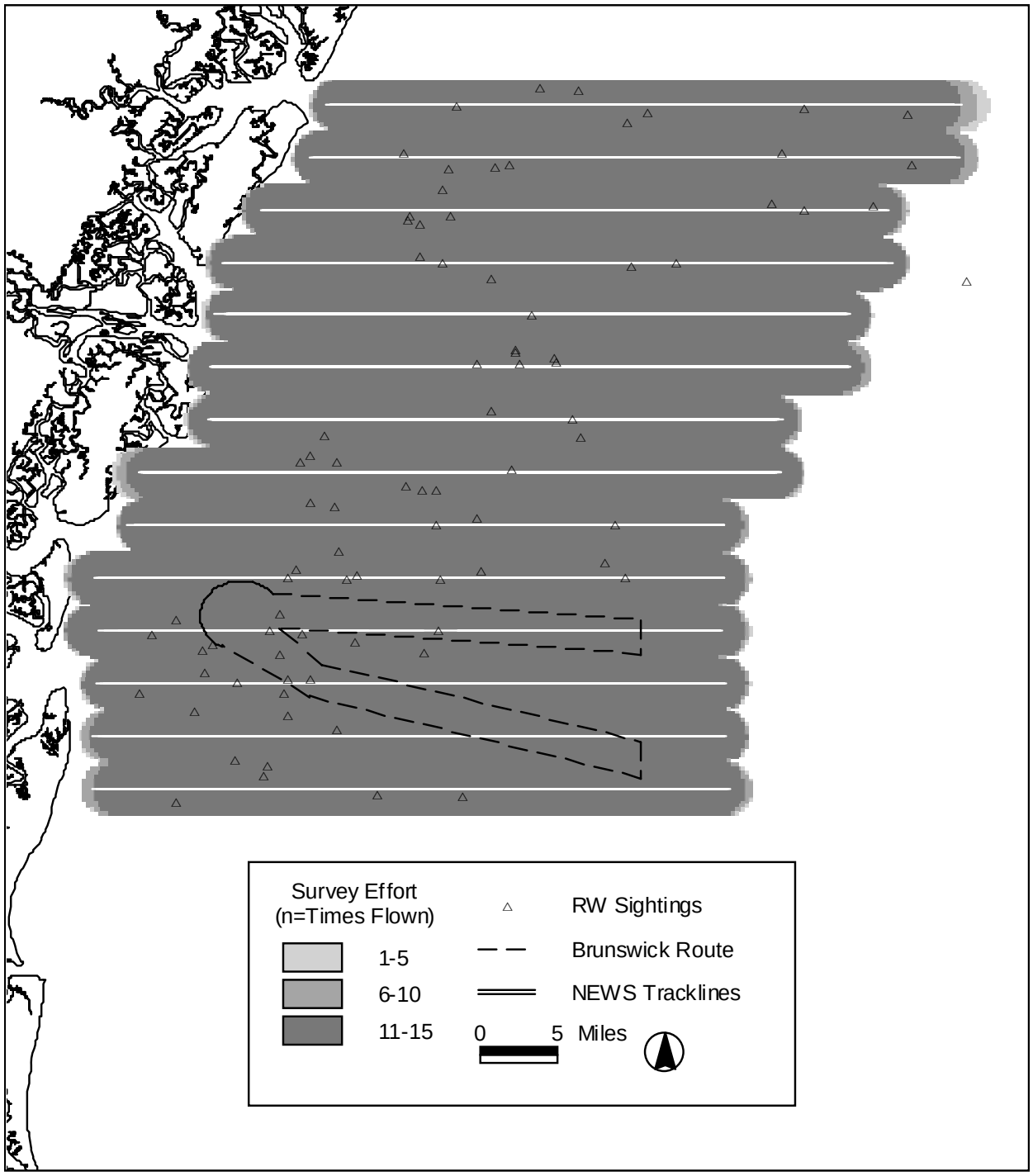

Figure 6: NEWS survey effort and right whale sightings during February 2008 (13 surveys flown).

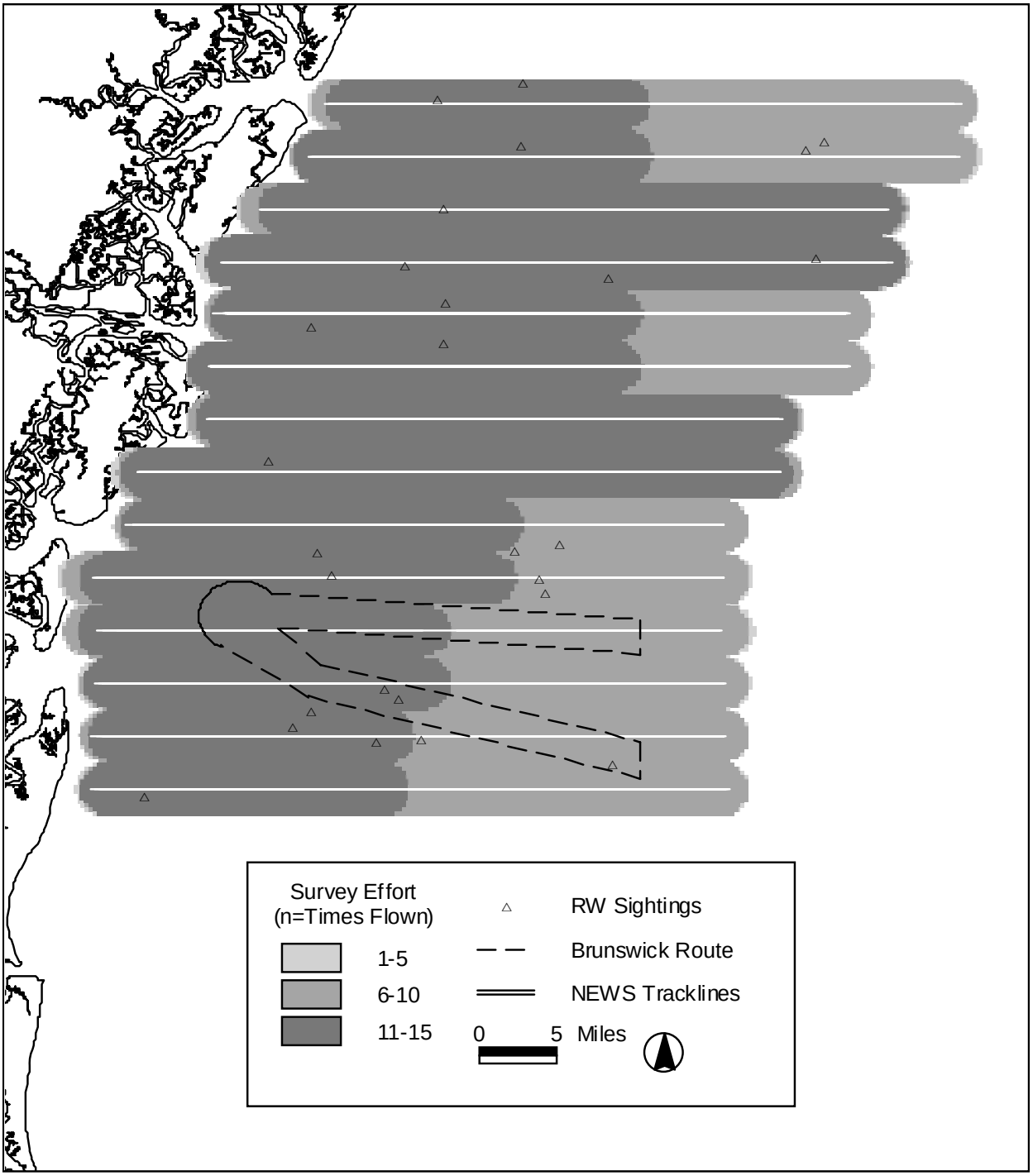

Figure 7: NEWS survey effort and right whale sightings during March 2008 (n = 11).

On three days in which the Wildlife Trust survey team could not fly the NEWS survey area due to plane maintenance or lack of project flight hours, the NEAq aerial survey team flew part of the NEWS area during the two-plane contingency plan. Coverage was provided on January 22, February 25 and March 29. In total, the NEAq team documented ten right whales sightings consisting of 33 right whales (including three cow/calf pairs) in the NEWS survey area over these three days (Table 4). Of the 33

whales sighted by NEAq, twenty-one of the whales have been initially identified. Nineteen of these initially identified whales were also sighted by the NEWS survey team in the study area. The other two right whales, EGNOs 1320 and 1712, were only documented in the NEWS area by the NEAq survey team.

Table 4: NEAq right whale sightings in the NEWS survey area during the 2007-2008 season.

Sighting Event	Month	Day	Year	Time (Local)	Latitude	Longitude	Number of Whales Sighted	Time of Report	NRW Number	EGNO
1	01	22	2008	1036	31.03333	-81.05000	1	1109	CEWS042	3180
2	01	22	2008	1048	30.95000	-81.03333	1	1111	CEWS043	1703
3	02	25	2008	1018	31.42333	-81.03333	1	1056	CEWS188	CT02BOF2004
4	02	25	2008	1042	31.38333	-81.05833	18	1101	CEWS189	3442, 1706, 3346, 1712, 1320, 3150, 3503, 2007 calf of 2614, 2006 calf of 2503 and Unknown
5	02	25	2008	1117	31.28333	-80.97000	2 (Cow/Calf)	1135	CEWS190	2040 and Calf
6	02	25	2008	1133	31.27333	-80.96667	2 (Cow/Calf)	1141	CEWS191	1408 and Calf
7	02	25	2008	1156	31.24000	-81.12500	2	1205	CEWS192	2042 and 3103
8	02	25	2008	1256	31.05667	-81.15500	2	1312	CEWS193	Unknown
9	02	25	2008	1309	31.05333	-81.27500	2 (Cow/Calf)	1323	CEWS194	1308 and Calf
10	02	25	2008	1604	30.89000	-81.12167	2	1613	CEWS196	3260 and Unknown

There were additional right whale sightings in the NEWS survey area that came from other outside sources. These sources included the GA DNR and FWRI research vessels, GA DNR Law Enforcement, Coast Guard (CG) and dredges operating in and around the Brunswick channel. The Wildlife Trust survey team would often receive information about right whale sightings from outside sources when a survey was being conducted. When this occurred, the survey team would make every effort to verify and document the reported whale sightings. However, during the season, there were occasions in which right whales were sighted by outside sources when the survey team was not flying due to weather or maintenance. In these cases, the right whale sightings could not be verified by the survey team. Table 5 lists six right whale sightings in the NEWS survey area that were not verified by the WT survey team.

Table 5: 2007-2008 right whale sightings in the NEWS survey area from outside sources.

Sighting Event	Month	Day	Year	Time (Local)	Latitude	Longitude	Number of Whales Sighted	Time of Report	NRW Number	Sighting Source
1	01	23	2008	1052	31.04532	-81.26503	2 (Cow/Calf)	1126	OTHER048	Dredge
2	02	03	2008	1749	31.05597	-81.28022	2 (Cow/Calf)	1830	OTHER062	Dredge
3	02	08	2008	1658	31.23333	-80.91667	2	1832	OTHER078	FWRI Research Vessel
4	02	25	2008	1040	31.06667	-81.26667	1	1122	OTHER106	Dredge
5	03	03	2008	1015	31.28333	-81.13333	2 (Cow/Calf)	1038	OTHER118	CG Helicopter
6	03	05	2008	1525	31.03650	-81.15490	2 (Cow/Calf)	1544	OTHER125	GA DNR LE

Wildlife Trust NEWS Right Whale Sightings and Identifications
A total of 168 right whale sightings were documented within the NEWS survey area, averaging 2.5 whales per sighting (range = 1-8) (Appendix 2). Sixty-three sightings consisted of cow/calf pairs, 29 were of single animals, 29 were of pairs of two right whales, and the remaining 47 sighting events were of groups of three to eight right whales (Figure 8). These totals do not include sightings by the NEAq survey team or other outside sources in the NEWS area (Tables 4 and 5).

Ten of the right whales observed during sightings were not photographically documented due to elusive behavior by the animals. Preliminary photo analysis of all other sightings by the Wildlife Trust team and initial verification by NEAq has resulted in the identification of 17 individual cow/calf pairs seen by the Wildlife Trust survey team. An additional 112 individual adult/juvenile whales were observed in the NEWS survey area. Any preliminary identifications from the North Atlantic Right Whale Catalog of these 146 total individual whales have been included in the "EGNO" column of Appendix 2. The numbers and codes listed in the "EGNO" column of Appendix 2 also include intermatch codes (i.e. CT06SEUS08, SE07BK08 and BK03BOF07) that were provided by NEAq or FWRI to assist in the preliminary matching of unknown whales until they are assigned EGNOs. Ninety of the 146 individual whales have been initially identified and assigned their EGNO number. Thirty-nine individual whales do not have a preliminary EGNO identification at this time and have been assigned intermatch codes. The remaining 17 individual whales are calves born in the 2007-2008 season. Basic demographic and 2007-2008 NEWS sighting information for the 90 initially identified whales is provided in Table 6. However, it should be reiterated that all right whale identifications listed within this report should be considered preliminary and unverified until NEAq has analyzed all photographs from the 2007-2008 southeast calving season. All of the images and data for the NEWS surveys have been forwarded to NEAq for this final confirmation process.

The overall number of right whales documented in the 2007-2008 NEWS season was an increase over the previous two survey seasons. Fifty-seven and 35% more right whale sightings were documented in 2007-2008 than in 2005-2006 and 2006-2007, respectively, despite similar levels of survey effort. The number of individual right whales sighted in the 2007-2008 NEWS season represents an increase of 37% and 40% over the 2005-06 and 2006-07 seasons, respectively. However, the number of cow and calf sightings and the number of individual cow/calf pairs were very similar amongst seasons.

Preliminary comparisons of whales sighted in the different SEUS survey areas (South Carolina/Northern Georgia, Northern EWS, Central EWS and Southern EWS) indicate that a total of 25 whales may have only been sighted in the NEWS survey area during the 2007-2008 season (Table 6). It is important to note that the image comparisons between the SEUS survey areas and the analyses of the North Atlantic Right Whale Catalog datasets from 2005 to 2008 are not complete at this time. Thus, the number of whales unique to the NEWS area and the sighting histories of some whales sighted during the 2007-2008 NEWS surveys may change as further photo analysis is conducted.

From December 2007 to April 2008, a total of 19 cow/calf pairs were identified in the Southeast US. All of these cows were observed within the NEWS survey area, 2 without a calf and 17 with their 2008 calves (Table 6). EGNO 1632 was seen four times without a calf in the NEWS area during the months of February and March. She was first sighted with a 2008 calf on April 6, 2008 off of South Carolina. EGNO1301 was observed with a newborn, dependent calf on December 5, 2007, off Florida (K. Jackson, pers. comm.). This cow was observed four times subsequently in the NEWS area without a calf. It is assumed that the dependent calf is dead. EGNO 1301 also lost her 2006 calf (NEAq, pers. comm.). EGNO 3180, a seven year old primiparous female, also lost her 2008 calf (Table 6). First sighted off the coast of Georgia on January 14, 2008 without a calf, she was then sighted with a very young calf on

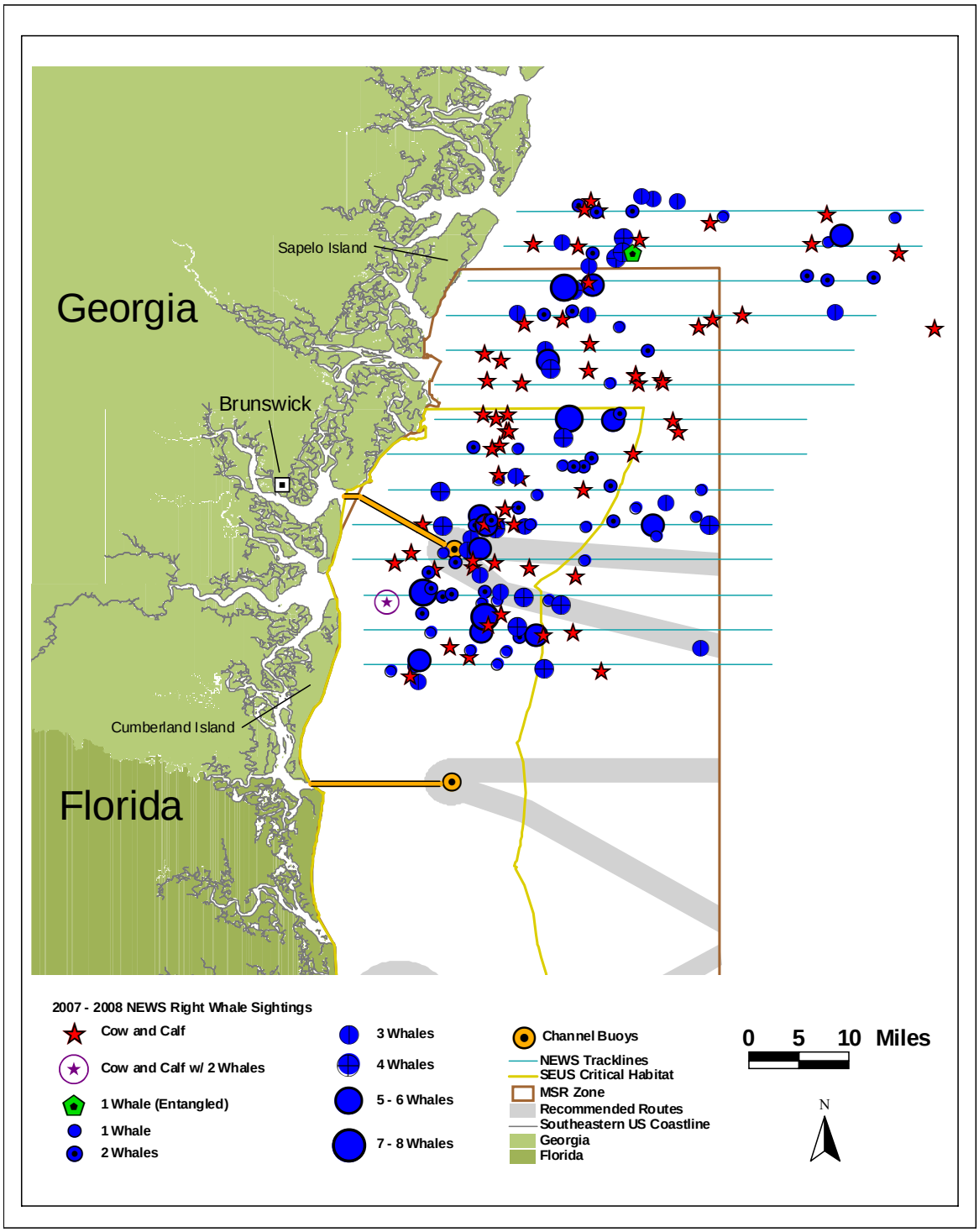

Figure 8: NEWS right whale sightings documented during the 2007-2008 SEUS calving season.

Table 6: Demographic information for preliminarily identified right whales sighted in the NEWS survey area during the 2007-2008 season. (Whales listed in italics are 2007-2008 cows. Whales with an asterisk "*" indicate possible unique animals to the NEWS survey area. Whale histories provided by NEAq)

EGNO	Sex	Age	Cow in 2007-2008 season	Last Calving	Number of Calves (including 2007-2008 season)	Comments
1150	M	Unknown	No	N/A	N/A	Seen only once in NEWS survey area; Never sighted before in the SEUS
1156	M	Unknown	No	N/A	N/A	Seen only once in NEWS survey area; Never sighted before in the SEUS
1227*	M	Unknown	No	N/A	N/A	Seen twice in NEWS survey area
1243	*F*	*26*	*Yes*	*2006*	*5*	*Cow and calf seen six times in NEWS area; 2006 calf presumed dead*
1245	*F*	*26*	*Yes*	*2005*	*4*	*Cow and calf seen four times in NEWS area*
1301	*F*	*25*	*Yes*	*2006*	*4*	*Seen four times in NEWS area after calving but never with her 2008 calf, 2008 calf presumed dead; 2006 calf also presumed dead*
1308	*F*	*25*	*Yes*	*2005*	*3*	*Cow and calf seen three times in NEWS area*
1317*	M	25	No	N/A	N/A	Seen only once in NEWS survey area
1321	F	Unknown	No	2004	N/A	Seen only once in NEWS survey area
1327*	M	Unknown	No	N/A	N/A	Seen only once in NEWS survey area
1408	*F*	*24*	*Yes*	*2005*	*4*	*Seen in NEWS area before and after calving, sighted once w/o calf and twelve times with calf*
1428	M	Unknown	No	N/A	N/A	Seen only once in NEWS survey area
1429	M	26	No	N/A	N/A	Seen only once in NEWS survey area; Never sighted before in the SEUS
1507*	M	23	No	N/A	N/A	Seen only once in NEWS survey area; Never sighted before in the SEUS
1616	M	Unknown	No	N/A	N/A	Seen only once in NEWS survey area
1622	*F*	*Adult*	*Yes*	*2005*	*4*	*Cow and calf seen four times in NEWS area*
1632	*F*	*Adult*	*Yes*	*2005*	*3*	*Seen four times in NEWS area before calving; First seen with 2008 calf in April off SC*
1703	*F*	*21*	*Yes*	*2005*	*3*	*Cow and calf seen six times in NEWS area*
1706	F	21	No	N/A	N/A	Seen only once in NEWS survey area
1802	*F*	*20*	*Yes*	*2006*	*3*	*Cow and calf seen only once in NEWS area; 2006 calf presumed dead*
1812	*F*	*Unknown*	*Yes*	*2004*	*4*	*Cow and calf seen three times in NEWS area*
1901*	M	19	No	N/A	N/A	Seen only once in NEWS survey area
1934	F	19	No	N/A	N/A	Seen four times in NEWS survey area
2040	*F*	*18*	*Yes*	*2005*	*3*	*Cow and calf seen five times in NEWS area*
2042	F	18	No	N/A	N/A	Seen five times in NEWS survey area
2215	M	16	No	N/A	N/A	Seen only once in NEWS survey area
2330	*F*	*Adult*	*Yes*	*2004*	*2*	*Seen in NEWS area before and after calving, sighted three times w/o calf and five times with calf*
2360*	F	Unknown	No	2007	N/A	Seen only once in NEWS survey area, sighted with yearling (EGNO 3760); Last sighted in SEUS as cow w/ calf on July 17, 2007 off Florida
2406*	M	14	No	N/A	N/A	Seen twice in NEWS survey area
2427	M	14	No	N/A	N/A	Seen twice in NEWS survey area
2470	M	Unknown	No	N/A	N/A	Seen only once in NEWS survey area
2608	M	12	No	N/A	N/A	Seen four times in NEWS survey area

EGNO	Sex	Age	Cow in 2007-2008 season	Last Calving	Number of Calves (including 2007-2008 season)	Comments
2614	F	12	No	2007	N/A	Seen only once in NEWS survey area, sighted with yearling (2007 Calf of 2614)
2615	M	12	No	N/A	N/A	Seen only once in NEWS survey area; Last time seen in the SEUS was as a calf
2740	M	11	No	N/A	N/A	Seen only once in NEWS survey area
2753	*F*	*11*	*Yes*	*N/A*	*1*	*Cow and calf seen three times in NEWS area; First time cow in 2007-2008 season*
2790	*F*	*Unknown*	*Yes*	*2005*	*2*	*Cow and calf seen only once in NEWS area*
2795	M	Unknown	No	N/A	N/A	Seen only once in NEWS survey area
3010	F	Unknown	No	2005	N/A	Seen twice in NEWS survey area
3020	*F*	*Unknown*	*Yes*	*N/A*	*1*	*Seen in NEWS area before and after calving, sighted twice w/o calf and once with calf; First time cow in 2007-2008 season; Never sighted before in the SEUS*
3040	M	Unknown	No	N/A	N/A	Seen twice in NEWS survey area
3060 (BK33)	U	Unknown	No	N/A	N/A	Seen only once in NEWS survey area
3103	F	7	No	N/A	N/A	Seen five times in NEWS survey area
3110	M	7	No	N/A	N/A	Seen only once in NEWS survey area
3115*	F	7	No	N/A	N/A	Seen five times in NEWS survey area; Last time seen in the SEUS was as a calf
3120	M	7	No	N/A	N/A	Seen twice in NEWS survey area
3130	*F*	*7*	*Yes*	*N/A*	*1*	*Seen in NEWS area before and after calving, sighted twice w/o calf and five times with calf; First time cow in 2007-2008 season*
3142	F	7	No	N/A	N/A	Seen only once in NEWS survey area
3150	M	7	No	N/A	N/A	Seen four times in NEWS survey area
3157	F	7	No	N/A	N/A	Seen twice in NEWS survey area; Last time seen in the SEUS was as a calf
3180	*F*	*7*	*Yes*	*N/A*	*1*	*Seen in NEWS area before and after calving, sighted once w/o calf, once with newborn calf and then three times w/o calf; 2008 calf presumed dead; First time cow in 2007-2008 season*
3230	F	6	No	N/A	N/A	Seen seven times in NEWS survey area
3240	F	6	No	N/A	N/A	Seen only once in NEWS survey area
3245	M	6	No	N/A	N/A	Seen four times in NEWS survey area
3260	F	Unknown	No	N/A	N/A	Seen only once in NEWS survey area
3292	*F*	*6*	*Yes*	*N/A*	*1*	*Seen in NEWS area before and after calving, sighted once w/o calf and once with calf; First time cow in 2007-2008 season*
3293	*F*	*Unknown*	*Yes*	*N/A*	*1*	*Seen in NEWS area before and after calving, sighted once w/o calf and twice with calf; First time cow in 2007-2008 season*
3314	F	5	No	N/A	N/A	Seen six times in NEWS survey area; "Yellowfin", previously entangled
3323	M	5	No	N/A	N/A	Seen only once in NEWS survey area
3330	U	5	No	N/A	N/A	Seen three times in NEWS survey area
3333	M	5	No	N/A	N/A	Seen only once in NEWS survey area; Entangled when sighted in the SEUS, sighted gear free in Great South Channel in May 2008

EGNO	Sex	Age	Cow in 2007-2008 season	Last Calving	Number of Calves (including 2007-2008 season)	Comments
3340	M	5	No	N/A	N/A	Seen only once in NEWS survey area
3346	M	5	No	N/A	N/A	Seen twice in NEWS survey area; "Kingfisher", entangled since 2004
3401	M	4	No	N/A	N/A	Seen only once in NEWS survey area
3405	F	4	No	N/A	N/A	Seen only once in NEWS survey area
3411	F	4	No	N/A	N/A	Seen three times in NEWS survey area
3420	F	4	No	N/A	N/A	Seen only once in NEWS survey area
3421	M	4	No	N/A	N/A	Seen nine times in NEWS survey area
3423	M	4	No	N/A	N/A	Seen twice in NEWS survey area
3430	F	4	No	N/A	N/A	Seen four times in NEWS survey area
3442	M	4	No	N/A	N/A	Seen only once in NEWS survey area
3460	U	4	No	N/A	N/A	Seen four times in NEWS survey area
3466	M	4	No	N/A	N/A	Seen three times in NEWS survey area
3503	F	3	No	N/A	N/A	Seen four times in NEWS survey area
3513	F	3	No	N/A	N/A	Seen three times in NEWS survey area; Last time seen in the SEUS was as a calf
3520	F	3	No	N/A	N/A	Seen three times in NEWS survey area
3540	F	3	No	N/A	N/A	Seen six times in NEWS survey area
3541	M	3	No	N/A	N/A	Seen twice in NEWS survey area
3545	M	3	No	N/A	N/A	Seen seven times in NEWS survey area
3550	U	3	No	N/A	N/A	Seen only once in NEWS survey area
3579	M	3	No	N/A	N/A	Seen six times in NEWS survey area; Last time seen in the SEUS was as a calf
3760*	U	1	No	N/A	N/A	Seen only once in NEWS survey area, yearling sighted with cow (EGNO 2360); Last sighted in SEUS as calf w/ cow on July 17, 2007 off Florida
2006 Calf of 1503	U	2	No	N/A	N/A	Seen only once in NEWS survey area
2006 Calf of 1611	U	2	No	N/A	N/A	Seen four times in NEWS survey area
2006 Calf of 1946	U	2	No	N/A	N/A	Seen four times in NEWS survey area
2006 Calf of 2123	U	2	No	N/A	N/A	Seen three times in NEWS survey area
2006 Calf of 2503	U	2	No	N/A	N/A	Seen three times in NEWS survey area
2007 Calf of 2614	U	1	No	N/A	N/A	Seen four times in NEWS survey area, yearling sighted once with cow (EGNO 2614) and then three times w/o cow
2007 Calf of 2642	U	1	No	N/A	N/A	Yearling sighted three times in NEWS survey area
2007 Calf of 3360	U	1	No	N/A	N/A	Yearling sighted only once in NEWS survey area; Yearling was sighted with an unidentified whale that was possibly its cow (EGNO 3360); 2007 calf of 3360 was sighted twice in the SEUS with 3360 after being seen in the NEWS area.

February 8, 2008 (Appendix 2). She was observed again on February 14, 20, and 21, 2008 without a calf. It is assumed that the 2008 calf died between February 8 and 14, 2008.

Entangled Right Whales
Two entangled right whales (EGNO 3333 and EGNO 3346) were observed during the 2007-2008 NEWS surveys. At the time of their sightings, digital images of the entangled right whales were sent to NEAq and the Provincetown Center for Coastal Studies (PCCS) for assessment of each whale's condition. Also, information pertaining to each sighting was passed on to the proper authorities within GA DNR and NOAA Fisheries.

Entangled EGNO 3333 was first sighted in the SEUS off Florida by the NEAq survey team on January 29, 2008. The whale was entangled through the mouth with approximately 35-50 feet of blue line. The NEWS survey team re-sighted the entangled whale in similar condition on February 2, 2008 off of Sapelo Island, GA (Fig. 8, Appendix 2). The NEWS survey team suspended the survey and tracked the whale for approximately 1.5 hours, pending a decision from NOAA and GDNR whether to initiate a disentanglement response. A response was not initiated and the team resumed their normal survey. The whale was re-sighted off Massachusetts on May 7, 2008 and appeared to be free of gear (G. Krutzikowsky, pers. comm.).

Entangled EGNO 3346 was observed by the NEWS survey team on February 7 and 24, 2008 (Appendix 2). This male juvenile right whale, known as "Kingfisher", was first seen entangled off of Florida on March 17, 2004. Based on images from FWRI, PCCS determined that the remaining entanglement did not present an imminent threat to the whale and no disentanglement attempt was made during the 2007-2008 season (G. Krutzikowsky, pers. comm.).

Dead Right Whales
No dead right whales or other large whales were sighted during the 2007-2008 NEWS survey season.

Temporal and Spatial Movements of Right Whales
Figures 4-7 and Figure 9 illustrate the NEWS right whale sightings classified by survey month. Figures 4 and 5 show that right whale sightings in December and January fell entirely in the western half of the NEWS area. Not until February (Figure 6) and March (Figure 7) did the right whale sightings begin to spread further offshore and into the eastern half of the NEWS survey zone. Figure 9 illustrates that the right whale sightings for the entire 2007-2008 season were generally spread throughout the NEWS survey area, except for the sections of tracklines 1-10 that fell to the east of the MSR zone. By the end of the season, no whales had been spotted on the eastern ends of tracklines 1-10, even though whales had been sighted on the eastern ends of the more northern tracklines, 11-14. Overall, 46% of the 168 right whale sightings documented during the 2007-2008 NEWS season were located outside of the currently designated right whale critical habitat and 41% of these sightings contained cow/calf pairs.

During all survey months, a majority of the right whale sightings occurred in the southern seven tracklines of the NEWS survey area (Figures 4-7). Large sections of these southern tracklines fall within the SEUS designated right whale critical habitat and are also notable due to the fact that the Brunswick shipping channel and recommended shipping routes cut through the middle of these tracklines (Figure 9). A minimum of ten right whale sightings fell directly within the southern recommended shipping route.

Many of the whales observed in the NEWS area were resighted on multiple occasions by the Wildlife Trust team (Table 6 and Appendix 2). The greatest number of resights occurred with EGNO 1408. This cow was sighted on December 10, 2007 without a calf and again on December 20, 2007 with a calf. EGNO 1408 and her 2008 calf were subsequently observed 11 more times, for a total of thirteen sightings of EGNO 1408 in the NEWS area and during every month of the 2007-2008 season. The 2007-2008

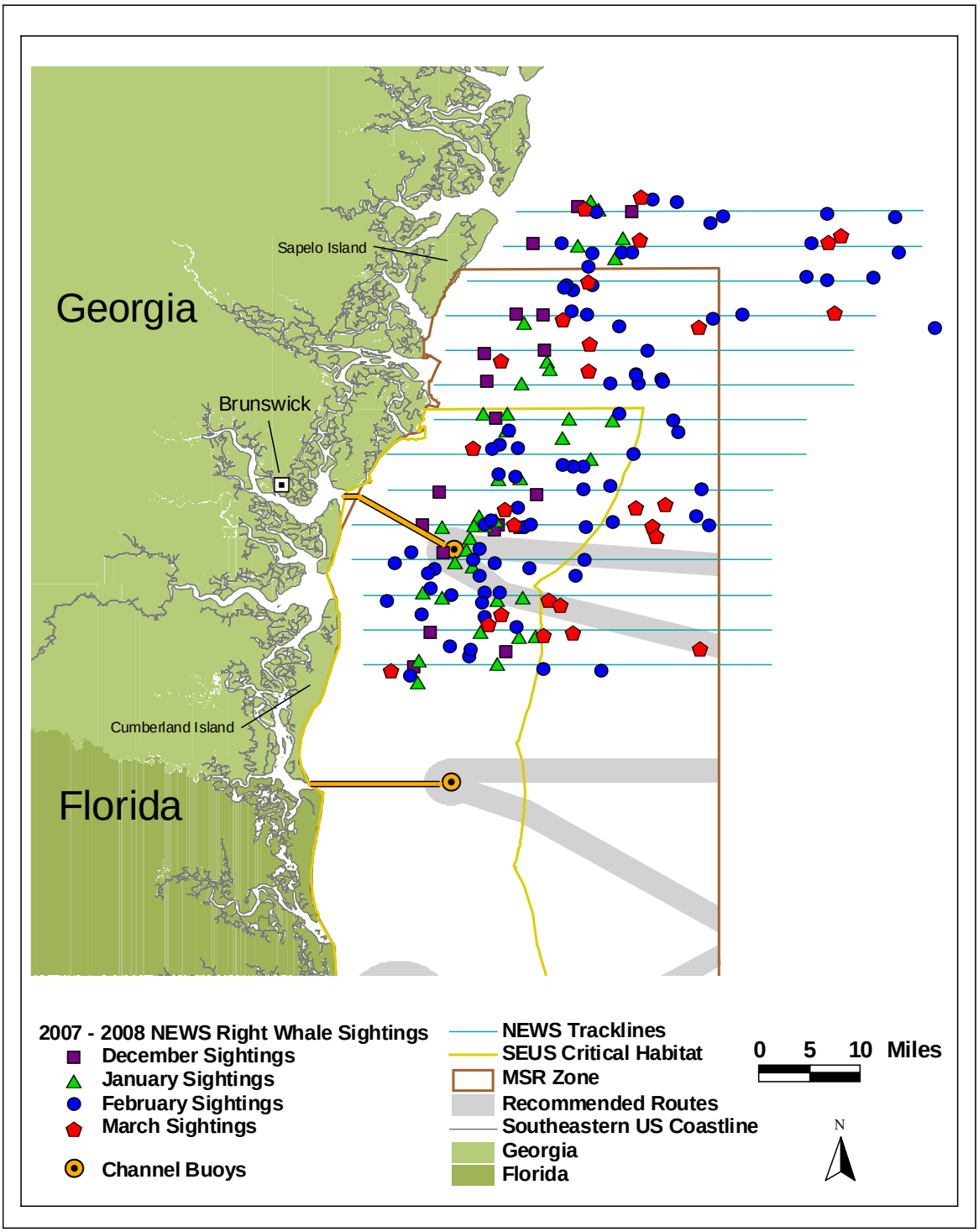

Figure 9: Northern Early Warning System 2007-2008 right whale sightings classified by month.

cows were resighted an average of 4.5 times within the NEWS survey area (range = 1-13). The 2007-2008 resight frequency for non-calving females and males were lower than the observed resight patterns for cows. The 42 known non-calving females documented during the NEWS surveys (Table 6) displayed an average resight rate of 1.6 sightings. The 35 known males were resighted an average of 2.7 times in the NEWS area (Table 6). However, when just sexually mature males (10 years or older) (Kraus *et al.*, 2007) were considered, the average resight rate for adult males decreased to 1.4 sightings.

During the 2007-2008 season, surface-active groups (SAGs) observed in the NEWS area occasionally involved adult males ranging from 12 to 16 years of age and adult females. On February 16, 2008, a SAG of eight whales was sighted where intromission into an adult female (EGNO 1934) by an adult male (EGNO 2608) was observed. Double intromission into EGNO 1934 was also observed during this sighting, involving the same adult male and a seven year old male (EGNO 3150).

Sighting Distances and Sea States for Right Whales

Sighting distances for the 168 right whale sightings were calculated whenever possible and the average sighting distance was 0.55 NM (SD = 0.49). The sighting distances ranged from 0.0 NM to 2.45 NM, with 99% of the sightings occurring from 0.0 NM to 1.93 NM (Figure 10). Ninety percent of the right whale sightings with a calculated sighting distance occurred in a Beaufort sea state of 3 or below, while 10% of the sightings occurred in a Beaufort sea state of 4 or above. When right whale sightings without a calculated sighting distance were included in the analysis of sighting sea state, the percentage results were exactly the same (90% in a sea state ≤ 3, 10% in a sea state ≥ 4). However, it should be noted that because an attempt was made to only fly surveys on days with a sea state of 3 or less, these whale sighting results are skewed towards whales being sighted in lesser sea states.

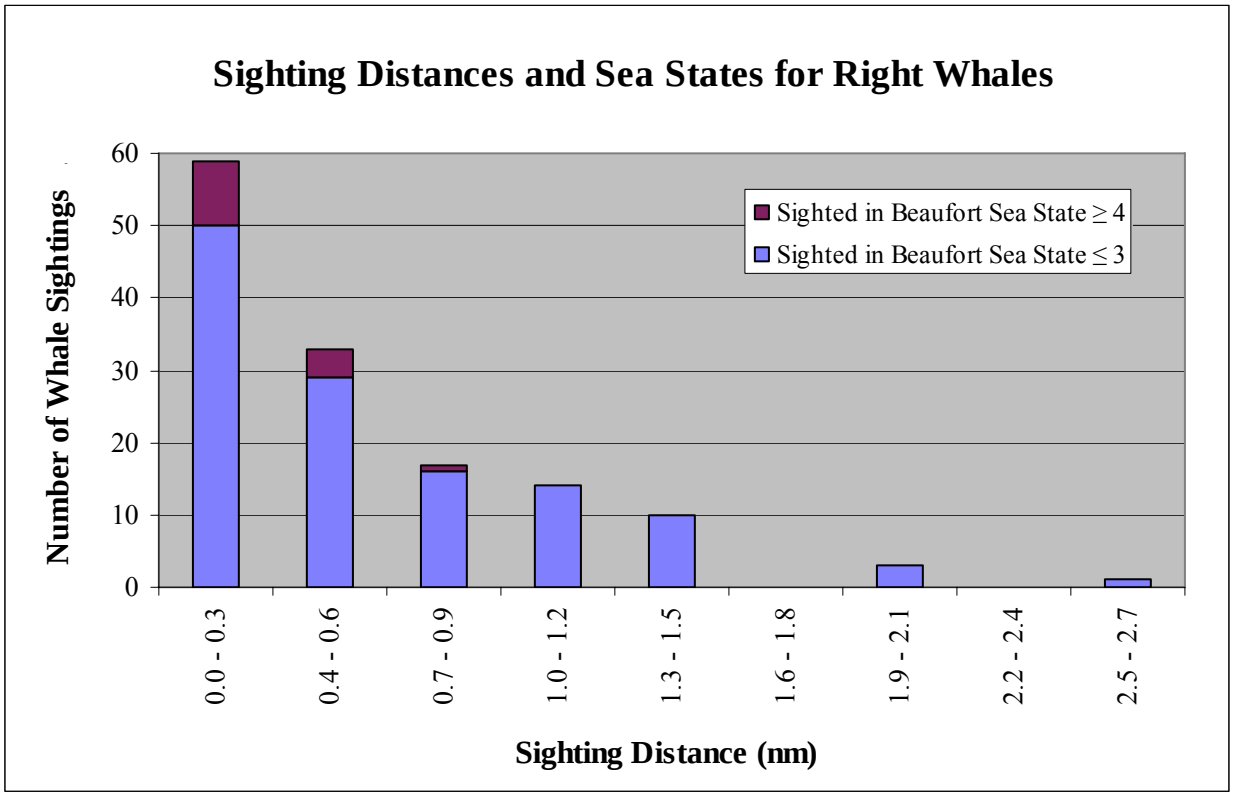

Figure 10: Right whale sighting distances and sea states for the 2007-2008 NEWS survey season.

Marine Animal Sightings
All sightings of large whales, leatherback turtles and manatees were recorded while conducting the NEWS surveys. During the 2007-2008 NEWS surveys, no large whales (besides right whales) or manatees were sighted. Appendix 3 provides information on the 109 leatherback turtles documented within the study area.

Humpback Whale Sightings
No humpback whales were sighted during the 2007-2008 NEWS survey season.

Whale/Vessel Interactions
The Wildlife Trust survey team observed one whale/vessel interaction ("close call") involving two vessels and two groups of ten right whales on January 7, 2008 (Appendix 1). An estimated 40 foot sailboat was observed under sail and heading directly towards one group of whales. The sailboat initially did not change course or speed after being notified of the whales in close proximity, but after a second communication with the survey plane the vessel slowed and changed course. The second vessel, an estimated 50 foot motor yacht, was not contacted because it was on a course that would not bring it in close proximity to either group of whales. The interaction involved EGNOs 3550, 3540, 2006 Calf of 1611, 3513, 3545, SE07CT15, BK03BOF07, BK05SEUS08, 3115 and 3430. The ten whales involved in the incident did not appear to react to the activity or close proximity of the two vessels. Immediately following the observed events, the required whale/vessel interaction forms were completed and forwarded to the proper authorities within GA DNR and NOAA Fisheries.

Discussion

The objectives of the 2007-2008 NEWS surveys were to reduce ship collisions with right whales, document and provide support for right whale disentanglement, document dead and stranded right whales, monitor the status and trends of abundance and distribution of the western North Atlantic right whale, characterize and monitor right whale habitat. While it is difficult or impossible to quantify the reduction in ship collisions as a result of these surveys, we feel that overall the objectives of this study were met. Whale locations were provided to mariners in a timely fashion, no ship collisions were documented in the area, two entangled whales were documented and disentanglement support was provided when needed, no dead or stranded right whales were located, and information was provided on the habitat use and distribution of at least 146 individual right whales.

The Early Warning System attempts to provide protection for right whales from vessel collisions while on the calving ground. During the 2007-2008 survey season, the considerable increase in the number of right whales observed in the NEWS survey area, along with the substantial number of those whales observed in close proximity to the Brunswick channel and the recommended shipping routes, all point toward the continued need for the EWS system. There was an increase in presence of individual right whales in the study area of 37% and 40% over the 2005-06 and 2006-07 calving seasons, respectively. While there was not a corresponding increase in the number of cow/calf pairs in the region, the increased use by other size/age classes of whales indicates the importance of the area to the entire population. The 2007-2008 season had the highest number of individual right whales documented in the NEWS survey area since NOAA Fisheries redesigned the Early Warning System surveys in 2002. Despite this increase in the number of whales inhabiting the region, only one "close call" was observed by the NEWS survey team involving two vessels under 50 feet in length. This is fortunate due to the multiple right whale sightings very close to and within the boundaries of the recommended shipping routes. The limitations of the survey effort must be noted, considering that 261 hours were spent in the air over a 4-month period consisting of 2,928 hours. The surveys provided visual coverage during approximately 9% of the calving

season, therefore we must take into account the events, interactions, and whales that went unobserved throughout the season.

Coverage of the survey area varied throughout the season due to high seas states and delayed departures from fog. The eastern ends of lines 11-14 were the least flown sections of the study area. The eastern ends of all tracklines were flown less frequently than the western ends generally due to increased sea states further from shore. Low numbers of right whale sightings were noted on the eastern ends of tracklines 1-10. This did not appear to be the result of survey bias, as these tracklines were flown more frequently than the eastern ends of lines 11-14. However, a full sightings per unit of effort analysis should be completed to systematically document survey coverage and whale use of the area. The early influx of whales to the SEUS in the 2007-2008 season highlights the benefit of evenly distributing survey effort across the survey season in order to catch fluctuations in the timing of right whale migrations.

All of the 19 calving females were documented in the NEWS survey area during 2007-2008. Based on sighting histories contained in the New England Aquarium North Atlantic Right Whale Catalog, two of the 19 cows had a 4 year calving interval (EGNOs 1812 and 2330), eight cows had a three year calving interval (EGNOs 1245, 1308, 1408, 1622, 1632, 1703, 2040, 2790), the three cows that lost their 2006 calves (EGNOs 1243, 1301 and 1802) had two year calving intervals, and six of the cows (EGNOs 2753, 3020, 3130, 3180, 3292 and 3293) had their first known calving event in the 2007-2008 season. Not including the females who lost their 2006 calves, the resulting calving interval for the 2007-2008 SEUS calving season was 3.2 years. Of the primiparous cows, two whales were seven years old at the time of calving (EGNOs 3130 and 3180) and one cow (EGNO 3292) was six years old. The youngest known age of calving for a right whale female is five years (Kraus *et al.*, 2007).

Many of the right whales observed in the NEWS survey area were resighted on multiple occasions, including 88% of cow/calf pairs resighted at least once (range = 1-12 resights). EGNO 1408 was resighted the most during the surveys, observed twelve times are giving birth to her 2008 calf. Based on re-sighting events only in the NEWS survey area, we can speculate on minimum "residency" time of individual whales on the SEUS calving grounds. EGNO 1408 was first sighted by the NEWS team on December 10, 2007 and last sighted on March 1, 2008, suggesting that this female spent at least 82 days in the SEUS. EGNO 1243 was seen 83 days apart, the longest "residency" documented by the NEWS team. The average minimum residency time of all calving females noted by the NEWS team was 37.5 days. Comparison of individual animal locations and distribution between all EWS teams, as well as survey teams in the mid-Atlantic region, will provide a more complete and useful picture of right whale movements and residency patterns throughout the region.

While we highly recommend identifying other means of right whale protection and detection, such as passive acoustic monitoring, increased education of the public and maritime community, shipping speed restrictions, and ship routing, we recognize that in the interim the current survey program, or some iteration of the current survey design, is the most effective method we have for locating right whales. We recommend a continuation of the Northern Early Warning Systems surveys from December 1, 2008 through March 31, 2009.

Acknowledgements

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Appendix 1. 2007-2008 NEWS whale/vessel interaction report forms.

Whale/Ship Interaction (Close Call) Report Form

Date 1 /7 /2008 **Unique Report #** 50

Observer's Last Name(s) Naessig, Foley, Grassia and Brower **Contact** Patricia Naessig 507-581-1147

Survey Agency or Organization: WLT

Survey Area Northern EWS

Are there photos? Yes **Location/name of photo files** 2008-01-07-WT-GA

Is there video? No **Location/name of video files** N/A

Whale Information (Initial)

Time of initial whale sighting (local, 24 hour) 1139 **Total number of whales** 10 **Number of calves** 0

Whale IDs 3550, 3540, 2006 Calf of 1611, 3513, 3545, SE07CT15, BK03OF07, BK05SEUS08, 3115, 3430

Whale's initial activity (select the one that best fits; use description for additional activities)

Select: Milling

Description of whale activity The whales consisted of a group of eight whales and a group of two whales off St. Andrew Sound, GA. The group of eight whales were milling in four distinct sub-groups spread out over about a 400 yard distance. The group of two whales were also milling about 2 miles to the east of the group of eight animals. The initial location below is for the eight whales. The initial location for the two whales was 30.98049 N -81.2563 W at 1209 (L).

Heading of Whale/Whale group None

Whale's initial latitude 30.98645 N **Whale's initial longitude** -81.28392 W **(NAD 83 datum assumed)**

Whale Information (Post Interaction)

Time whale was observed at the last location (local, 24 hour) 1221

Whale's last latitude 30.98343 **Whale's last longitude** -81.2886 **(NAD 83 datum assumed)**

Did the whale change course? No **Did the whale's activity change?** No

New heading of Whale/Whale group N/A

Description of activity/direction change:

The group of eight whales and the group of two whales were observed milling in the same general areas throughout the entire sighting. The whales did not appear to react to the presence of the 2 vessels in the area during the time the Wildlife Trust survey team was observing the whales. The final location information above is for the group of eight whales. The final location for the group of two whales was 30.9868 N -81.28247 W at 1224 (L).

Additional Information

While observing a group of eight right whales and a group of two right whales, the NEWS team witnessed a whale/ship interaction involving the two groups of whales and an estimated 40 foot sailboat and an estimated 50 foot motor yacht. The survey plane observed that the sailboat was under sail and heading southwest directly towards the group of eight whales. The group of two whales were also milling about 2 miles to the east of the group of eight animals. When the sailboat was about a mile to the northeast of the eight whales, the survey plane hailed the vessel on VHF channel 16 and informed the sailboat that they had right whales directly in front of them and that right whales should not be approached within 500 yards. The vessel acknowledged the transmission, but did not change direction or speed. About eight minutes later, the sailboat was then observed still heading towards the whales and within about 500 yards of the animals. The survey plane again hailed the vessel and reminded them of the approach regulations. Shortly after the radio communication, the sailboat was observed slowing and changing direction from southwest to southeast. Following the contact with the sailboat, the NEWS survey team observed an estimated 50 foot motor yacht heading south about a mile to the east of the group of eight whales and about a mile to the west of the group of two whales in the area. The survey plane did not contact the motor yacht and the vessel was observed traveling at about 15-20 knots directly between the two groups of whales. There are no photos of the whales and vessels together.

FWC Whale/Ship Interaction (Close Call) Report Form

Date 1 /7 /2008 **Unique Report #** 50

Vessel Information

Is this a close approach (500 yard rule?) Yes **Homeport** Unknown **State Reg. #** Unknown

Vessel 1 **of** 2 **(one sheet for each vessel)** **Time vessel was spotted (24 hour)** 1207

Vessel Length (feet) 40 **Vessel Name** Unknown

Vessel Code SV-S **Vessel Type:** Recreational

Vessel Description Private sloop sailboat

Vessel Speed (knots) 5 **Vessel Speed (Qualitative):** Slow

Method of determining speed Visual **Vessel Heading** Southwest

Inbound/Outbound: **Destination Port** Unknown

Origin Port Unknown

Description of vessel's initial location relative to whale(s)

Sailboat was first observed about a mile to the northeast of the group of eight whales.

Vessel's initial latitude 31.00677 N **Vessel's initial longitude** -81.27409 W **(NAD 83 datum assumed)**

Closest distance between whale and vessel 400 **Units:** Yards

Was communication attempted? (Did you try to hail them?): Yes

Was communication achieved? (Did they respond?): Yes

Did the vessel's heading change?: Yes **New Heading** Southeast

Did the vessel's speed change?: Yes **New Speed (knots)** 2

New Vessel Speed Qualitative: Slow

Description of vessel's last location relative to whale(s)

The sailboat was last observed about 500 yards to the ENE of the group of eight whales.

Notes on the communication effort

The survey plane observed that the sailboat was under sail and heading southwest directly towards the group of eight whales. When the sailboat was about a mile to the northeast of the eight whales, the survey plane hailed the vessel on VHF channel 16 and informed the sailboat that they had right whales directly in front of them and that right whales should not be approached within 500 yards. The vessel acknowledged the transmission, but did not change direction or speed. About eight minutes later, the sailboat was then observed still heading towards the whales and within about 500 yards of the animals. The survey plane again hailed the vessel and reminded them of the approach regulations. Shortly after the radio communication, the sailboat was observed slowing and changing direction from southwest to southeast.

Time of vessel's last recorded location (local, 24 hour) 1219

Vessel's last latitude 30.98532 N **Vessel's last longitude** -81.27425 W **(NAD 83 datum assumed)**

Additional whale information specific to this vessel

January 7, 2008 WT-GA Whale/Vessel Interaction Vessel 1

Vessel Information

Is this a close approach (500 yard rule?) No **Homeport** Unknown **State Reg. #** Unknown

Vessel 2 **of** 2 **(one sheet for each vessel)** **Time vessel was spotted (24 hour)** 1223

Vessel Length (feet) 50 **Vessel Name** Unknown

Vessel Code MV-S **Vessel Type:** Recreational

Vessel Description Motor Yacht

Vessel Speed (knots) 15-20 **Vessel Speed (Qualitative):** Fast

Method of determining speed Visual **Vessel Heading** South

Inbound/Outbound: **Destination Port** Unknown

Origin Port Unknown

Description of vessel's initial location relative to whale(s)

After documenting the whale/sailboat interaction, the NEWS survey team observed a motor yacht heading south about a mile to the east of the group of eight whales and about a mile to the west of the group of two whales.

Vessel's initial latitude 30.98018 N **Vessel's initial longitude** -81.26738 W **(NAD 83 datum assumed)**

Closest distance between whale and vessel 1 **Units:** Miles

Was communication attempted? (Did you try to hail them?): No

Was communication achieved? (Did they respond?): No

Did the vessel's heading change?: No **New Heading** N/A

Did the vessel's speed change?: No **New Speed (knots)** N/A

New Vessel Speed Qualitative: Fast

Description of vessel's last location relative to whale(s)

The motor yacht was last observed traveling at about 15-20 knots directly between the two groups of whales.

Notes on the communication effort

The survey plane did not attempt to contact the motor yacht because by the time the vessel was observed in close proximity to the whales it was apparent that the vessel was following a course that would not put it in contact with the groups of whales in the area.

Time of vessel's last recorded location (local, 24 hour) 1223

Vessel's last latitude 30.98018 N **Vessel's last longitude** -81.26738 W **(NAD 83 datum assumed)**

Additional whale information specific to this vessel

Only one location was obtained for the motor yacht. This location and time has been entered as the motor yacht's initial and final locations in this form.

Appendix 2. NEWS right whale sightings from 01 December 2007 through 28 March 2008.

Whale Number	Month	Day	Year	Time (Local)	Survey Name	Latitude	Longitude	RIWH Letter	EGNO	Time of Report (Local)	NRW Number	Comments	Sighting Distance (nm)
1	12	09	2007	1025	NEWS20071209	31.54048	-81.06170	A	2360	1046	NEWS001	w/ Yearling	0.43
2	12	09	2007	1025	NEWS20071209	31.54048	-81.06170	B	3760	1046	NEWS001	Yearling	0.43
3	12	09	2007	1624	NEWS20071209	30.87980	-81.29680	C	2330	1647	NEWS002		0.24
4	12	09	2007	1624	NEWS20071209	30.87980	-81.29680	D	3314	1647	NEWS002	Prev. Entgled	0.24
5	12	10	2007	1600	NEWS20071210	31.38558	-81.15013	A	1408	1627	NEWS003		N/A
6	12	10	2007	1600	NEWS20071210	31.38558	-81.15013	B	2330	1627	NEWS003		N/A
7	12	10	2007	1600	NEWS20071210	31.38558	-81.15013	C	3293	1627	NEWS003		N/A
8	12	18	2007	1029	NEWS20071218	31.53393	-80.98562	A	2330	1100	NEWS004		0.03
9	12	18	2007	1029	NEWS20071218	31.53393	-80.98562	B	3130	1100	NEWS004		0.03
10	12	18	2007	1209	NEWS20071218	31.32830	-81.19639	C	1243	1230	NEWS005	w/ Calf	0.29
11	12	18	2007	1209	NEWS20071218	31.32830	-81.19639	D	2008 Calf of 1243	1230	NEWS005	Calf	0.29
12	12	19	2007	0951	NEWS20071219	30.90205	-81.16453	A	1301	1040	NEWS006	Seen w/o 2008 Calf	1.93
13	12	20	2007	1309	NEWS20071220	31.29020	-81.19210	A	1408	1321	NEWS007	w/ Calf	0.46
14	12	20	2007	1309	NEWS20071220	31.29020	-81.19210	B	2008 Calf of 1408	1321	NEWS007	Calf	0.46
15	12	20	2007	1356	NEWS20071220	31.38405	-81.11068	C	3421	1419	NEWS008		0.00
16	12	20	2007	1356	NEWS20071220	31.38405	-81.11068	D	BK03BOF07	1419	NEWS008		0.00
17	12	20	2007	1453	NEWS20071220	31.48620	-81.12612	E	1622	1510	NEWS009	w/ Calf	0.17
18	12	20	2007	1453	NEWS20071220	31.48620	-81.12612	F	2008 Calf of 1622	1510	NEWS009	Calf	0.17
19	12	23	2007	1447	NEWS20071223	31.12615	-81.12032	A	3292	1508	NEWS010		0.49
20	12	23	2007	1544	NEWS20071223	31.23780	-81.18023	B	1243	1600	NEWS011	w/ Calf	0.21
21	12	23	2007	1544	NEWS20071223	31.23780	-81.18023	C	2008 Calf of 1243	1600	NEWS011	Calf	0.21
22	12	27	2007	1338	NEWS20071227	31.04493	-81.25488	A	3142	1357	NEWS013		0.63
23	12	27	2007	1401	NEWS20071227	31.08155	-81.14467	B	3130	1420	NEWS014		0.10
24	12	27	2007	1443	NEWS20071227	31.13083	-81.26096	C	3545	1512	NEWS015		0.13
25	12	27	2007	1443	NEWS20071227	31.13083	-81.26096	D	3421	1512	NEWS015		0.13
26	12	27	2007	1443	NEWS20071227	31.13083	-81.26096	E	2006 Calf of 1611	1512	NEWS015		0.13
27	12	27	2007	1443	NEWS20071227	31.13083	-81.26096	F	3314	1512	NEWS015	Prev. Entgled	0.13
28	12	27	2007	1624	NEWS20071227	31.33370	-81.10951	G	3240	1642	NEWS016		0.01
29	12	27	2007	1624	NEWS20071227	31.33370	-81.10951	H	2007 Calf of 3360	1642	NEWS016	Yearling	0.01
30	12	27	2007	1624	NEWS20071227	31.33370	-81.10951	I	No Photos	1642	NEWS016	No Photos	0.01
31	12	28	2007	1347	NEWS20071228	30.93043	-81.27408	A	SE07CT10	1417	NEWS017		0.23
32	12	28	2007	1454	NEWS20071228	31.08498	-81.28518	B	1243	1551	NEWS018	w/ Calf	0.09
33	12	28	2007	1454	NEWS20071228	31.08498	-81.28518	C	2008 Calf of 1243	1551	NEWS018	Calf	0.09
34	12	28	2007	1509	NEWS20071228	31.08542	-81.17627	D	3545	1557	NEWS019		0.13
35	12	28	2007	1515	NEWS20071228	31.07628	-81.18073	E	3430	1557	NEWS019		N/A
36	12	28	2007	1515	NEWS20071228	31.07628	-81.18073	F	2006 Calf of 1611	1557	NEWS019		N/A
37	12	28	2007	1515	NEWS20071228	31.07628	-81.18073	G	3421	1557	NEWS019		N/A
38	12	28	2007	1515	NEWS20071228	31.07628	-81.18073	H	BK03BOF07	1557	NEWS019		N/A
39	01	06	2008	1312	NEWS20080106	30.88993	-81.28909	A	BK05SEUS08	1347	NEWS020		0.43
40	01	06	2008	1312	NEWS20080106	30.88993	-81.28909	B	SE07CT10	1347	NEWS020		0.43

Whale Number	Month	Day	Year	Time (Local)	Survey Name	Latitude	Longitude	RIWH Letter	EGNO	Time of Report (Local)	NRW Number	Comments	Sighting Distance (nm)
41	01	06	2008	1312	NEWS20080106	30.88993	-81.28909	C	3430	1347	NEWS020		0.43
42	01	06	2008	1312	NEWS20080106	30.88993	-81.28909	D	3314	1347	NEWS020	Prev. Entgled	0.43
43	01	06	2008	1312	NEWS20080106	30.88993	-81.28909	E	3520	1347	NEWS020		0.43
44	01	06	2008	1324	NEWS20080106	30.85935	-81.29073	F	3545	1352	NEWS021		N/A
45	01	06	2008	1324	NEWS20080106	30.85935	-81.29073	G	3540	1352	NEWS021		N/A
46	01	06	2008	1324	NEWS20080106	30.85935	-81.29073	H	2006 Calf of 1611	1352	NEWS021		N/A
47	01	06	2008	1604	NEWS20080106	31.24218	-81.19800	I	1243	1621	NEWS022	w/ Calf	0.22
48	01	06	2008	1604	NEWS20080106	31.24218	-81.19800	J	2008 Calf of 1243	1621	NEWS022	Calf	0.22
49	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	A	3550	1238	NEWS023		N/A
50	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	B	3540	1238	NEWS023		N/A
51	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	C	2006 Calf of 1611	1238	NEWS023		N/A
52	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	D	3513	1238	NEWS023		N/A
53	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	E	3545	1238	NEWS023		N/A
54	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	F	SE07CT15	1238	NEWS023		N/A
55	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	G	BK03BOF07	1238	NEWS023		N/A
56	01	07	2008	1139	NEWS20080107	30.98645	-81.28392	H	BK05SEUS08	1238	NEWS023		N/A
57	01	07	2008	1209	NEWS20080107	30.98048	-81.25630	I	3115	1242	NEWS024		N/A
58	01	07	2008	1209	NEWS20080107	30.98048	-81.25630	J	3430	1242	NEWS024		N/A
59	01	07	2008	1328	NEWS20080107	30.97670	-81.17795	K	1301	1341	NEWS025	Seen w/o 2008 Calf	0.38
60	01	07	2008	1643	NEWS20080107	31.46500	-81.00795	L	3421	1707	NEWS026		1.85
61	01	07	2008	1643	NEWS20080107	31.46500	-81.00795	M	SE07BK08	1707	NEWS026		1.85
62	01	07	2008	1643	NEWS20080107	31.46500	-81.00795	N	3230	1707	NEWS026		1.85
63	01	07	2008	1643	NEWS20080107	31.46500	-81.00795	O	3579	1707	NEWS026		1.85
64	01	07	2008	1714	NEWS20080107	31.21887	-81.16403	P	2330	1730	NEWS027	w/ Calf	N/A
65	01	07	2008	1714	NEWS20080107	31.21887	-81.16403	Q	2008 Calf Of 2330	1730	NEWS027	Calf	N/A
66	01	08	2008	1441	NEWS20080108	31.31837	-81.10668	A	SE07BK08	1512	NEWS028		0.87
67	01	08	2008	1441	NEWS20080108	31.31837	-81.10668	B	3421	1512	NEWS028		0.87
68	01	08	2008	1441	NEWS20080108	31.31837	-81.10668	C	3579	1512	NEWS028		0.87
69	01	08	2008	1441	NEWS20080108	31.31837	-81.10668	D	3230	1512	NEWS028		0.87
70	01	08	2008	1441	NEWS20080108	31.31837	-81.10668	E	3520	1512	NEWS028		0.87
71	01	08	2008	1531	NEWS20080108	31.30655	-81.10142	F	3421	N/A	N/A	Resight of Sighting 1	1.36
72	01	08	2008	1531	NEWS20080108	31.30655	-81.10142	G	3579	N/A	N/A	Resight of Sighting 1	1.36
73	01	08	2008	1531	NEWS20080108	31.30655	-81.10142	H	No ID Photos	N/A	N/A	Resight of Sighting 1	1.36
74	01	08	2008	1531	NEWS20080108	31.30655	-81.10142	I	No ID Photos	N/A	N/A	Resight of Sighting 1	1.36
75	01	08	2008	1537	NEWS20080108	31.28710	-81.14242	J	2330	1600	NEWS029	w/ Calf	0.22
76	01	08	2008	1537	NEWS20080108	31.28710	-81.14242	K	2008 Calf of 2330	1600	NEWS029	Calf	0.22
77	01	08	2008	1556	NEWS20080108	31.24180	-81.16313	L	1408	1615	NEWS030	w/ Calf	0.52
78	01	08	2008	1556	NEWS20080108	31.24180	-81.16313	M	2008 Calf of 1408	1615	NEWS030	Calf	0.52
79	01	09	2008	1003	NEWS20080109	31.08045	-81.25695	A	CT07SEUS08	1032	NEWS031		N/A
80	01	09	2008	1003	NEWS20080109	31.08045	-81.25695	B	2006 Calf of 1946	1032	NEWS031		N/A
81	01	09	2008	1003	NEWS20080109	31.08045	-81.25695	C	3230	1032	NEWS031		N/A

Whale Number	Month	Day	Year	Time (Local)	Survey Name	Latitude	Longitude	RIWH Letter	EGNO	Time of Report (Local)	NRW Number	Comments	Sighting Distance (nm)
82	01	09	2008	1003	NEWS20080109	31.08045	-81.25695	1	SE07BK08	1032	NEWS031		N/A
83	01	09	2008	1111	NEWS20080109	31.48368	-81.06252	D	2330	1135	NEWS032	w/ Calf	0.00
84	01	09	2008	1111	NEWS20080109	31.48368	-81.06252	E	2008 Calf of 2330	1135	NEWS032	Calf	0.00
85	01	09	2008	1205	NEWS20080109	31.37315	-81.13914	F	1243	1228	NEWS033	w/ Calf	0.64
86	01	09	2008	1205	NEWS20080109	31.37315	-81.13914	G	2008 Calf of 1243	1228	NEWS033	Calf	0.64
87	01	09	2008	1303	NEWS20080109	31.23447	-81.07413	H	3430	1325	NEWS034		0.05
88	01	09	2008	1303	NEWS20080109	31.23447	-81.07413	I	2006 Calf of 2123	1325	NEWS034		0.05
89	01	09	2008	1303	NEWS20080109	31.23447	-81.07413	J	3540	1325	NEWS034		0.05
90	01	09	2008	1303	NEWS20080109	31.23447	-81.07413	K	3545	1325	NEWS034		0.05
91	01	09	2008	1303	NEWS20080109	31.23447	-81.07413	L	3115	1325	NEWS034		0.05
92	01	09	2008	1303	NEWS20080109	31.23447	-81.07413	M	CT06SEUS08	1325	NEWS034		0.05
93	01	09	2008	1303	NEWS20080109	31.23447	-81.07413	N	BK03BOF07	1325	NEWS034		0.05
94	01	09	2008	1342	NEWS20080109	31.20739	-81.08338	O	BK04SEUS08	1403	NEWS035		1.20
95	01	09	2008	1342	NEWS20080109	31.20739	-81.08338	P	3421	1403	NEWS035		1.20
96	01	09	2008	1342	NEWS20080109	31.20739	-81.08338	Q	3520	1403	NEWS035		1.20
97	01	09	2008	1342	NEWS20080109	31.20739	-81.08338	R	SE07CT10	1403	NEWS035		1.20
98	01	09	2008	1433	NEWS20080109	31.06472	-81.21718	S	CT07SEUS08	N/A	N/A	Resight of Sighting 1	1.15
99	01	09	2008	1433	NEWS20080109	31.06472	-81.21718	T	No ID Photos	N/A	N/A	Resight of Sighting 1	1.15
100	01	09	2008	1433	NEWS20080109	31.06472	-81.21718	U	2006 Calf of 1946	N/A	N/A	Resight of Sighting 1	1.15
101	01	09	2008	1544	NEWS20080109	31.02912	-81.23770	V	1301	1617	NEWS036	Seen w/o 2008 Calf	0.03
102	01	09	2008	1544	NEWS20080109	31.02912	-81.23770	W	SE07CT24	1617	NEWS036		0.03
103	01	09	2008	1554	NEWS20080109	31.04852	-81.22240	X	SE07BK08	N/A	N/A	Resight of Sighting 1	N/A
104	01	09	2008	1554	NEWS20080109	31.04852	-81.22240	Y	CT07SEUS08	N/A	N/A	Resight of Sighting 1	N/A
105	01	09	2008	1554	NEWS20080109	31.04852	-81.22240	Z	No ID Photos	N/A	N/A	Resight of Sighting 1	N/A
106	01	10	2008	0958	NEWS20080110	30.92320	-81.14709	A	2042	1022	NEWS037		0.60
107	01	10	2008	0958	NEWS20080110	30.92320	-81.14709	B	3103	1022	NEWS037		0.60
108	01	10	2008	1100	NEWS20080110	31.09622	-81.20425	C	3230	1135	NEWS038		0.75
109	01	10	2008	1100	NEWS20080110	31.09622	-81.20425	D	2006 Calf of 1946	1135	NEWS038		0.75
110	01	10	2008	1100	NEWS20080110	31.09622	-81.20425	E	CT07SEUS08	1135	NEWS038		0.75
111	01	10	2008	1100	NEWS20080110	31.09622	-81.20425	F	SE07BK08	1135	NEWS038		0.75
112	01	10	2008	1100	NEWS20080110	31.09622	-81.20425	G	1301	1135	NEWS038	Seen w/o 2008 Calf	0.75
113	01	10	2008	1221	NEWS20080110	31.23395	-81.01179	H	CT09SEUS08	1248	NEWS039		0.00
114	01	10	2008	1221	NEWS20080110	31.23395	-81.01179	I	SE07CT10	1248	NEWS039		0.00
115	01	10	2008	1221	NEWS20080110	31.23395	-81.01179	J	3540	1248	NEWS039		0.00
116	01	10	2008	1221	NEWS20080110	31.23395	-81.01179	K	3421	1248	NEWS039		0.00
117	01	10	2008	1221	NEWS20080110	31.23395	-81.01179	L	3513	1248	NEWS039		0.00
118	01	10	2008	1455	NEWS20080110	31.49459	-80.99741	M	3405	1516	NEWS040		0.69
119	01	10	2008	1455	NEWS20080110	31.49459	-80.99741	N	3115	1516	NEWS040		0.69
120	01	10	2008	1455	NEWS20080110	31.49459	-80.99741	O	3314	1516	NEWS040	Prev. Entgled	0.69
121	01	10	2008	1455	NEWS20080110	31.49459	-80.99741	P	2006 Calf of 2123	1516	NEWS040		0.69

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122	01	10	2008	1538	NEWS20080110	31.53399	-81.03265	Q	1408	1601	NEWS041	w/ Calf	0.00
123	01	10	2008	1538	NEWS20080110	31.53399	-81.03265	R	2008 Calf of 1408	1601	NEWS041	Calf	0.00
124	01	10	2008	1542	NEWS20080110	31.54695	-81.04294	S	2330	1602	NEWS042	w/ Calf	N/A
125	01	10	2008	1542	NEWS20080110	31.54695	-81.04294	T	2008 Calf of 2330	1602	NEWS042	Calf	N/A
126	01	14	2008	0926	NEWS20080114	30.92958	-81.20155	A	3545	1002	NEWS043		N/A
127	01	14	2008	0926	NEWS20080114	30.92958	-81.20155	B	3423	1002	NEWS043		N/A
128	01	14	2008	0926	NEWS20080114	30.92958	-81.20155	C	3421	1002	NEWS043		N/A
129	01	14	2008	0926	NEWS20080114	30.92958	-81.20155	D	3513	1002	NEWS043		N/A
130	01	14	2008	0926	NEWS20080114	30.92958	-81.20155	E	CT06SEUS08	1002	NEWS043		N/A
131	01	14	2008	0926	NEWS20080114	30.92958	-81.20155	1	3579	1002	NEWS043		N/A
132	01	14	2008	1016	NEWS20080114	31.08282	-81.21101	F	3180	1056	NEWS044		0.01
133	01	14	2008	1016	NEWS20080114	31.08282	-81.21101	G	3115	1056	NEWS044		0.01
134	01	24	2008	1124	NEWS20080124	31.08965	-81.17873	A	1408	1142	NEWS045	w/ Calf	0.47
135	01	24	2008	1124	NEWS20080124	31.08965	-81.17873	B	2008 Calf of 1408	1142	NEWS045	Calf	0.47
136	01	24	2008	1157	NEWS20080124	31.15075	-81.14415	C	1308	1246	NEWS046	w/ Calf	1.02
137	01	24	2008	1157	NEWS20080124	31.15075	-81.14415	D	2008 Calf of 1308	1246	NEWS046	Calf	1.02
138	01	24	2008	1224	NEWS20080124	31.14835	-81.17519	E	3545	1248	NEWS047		0.86
139	01	24	2008	1251	NEWS20080124	31.17883	-81.04335	F	2614	1310	NEWS048	w/ Yearling	0.31
140	01	24	2008	1251	NEWS20080124	31.17883	-81.04335	G	2007 Calf of 2614	1310	NEWS048	Yearling	0.31
141	01	29	2008	1049	NEWS20080129	31.02416	-81.21333	A	1408	1123	NEWS049	w/ Calf	N/A
142	01	29	2008	1049	NEWS20080129	31.02416	-81.21333	B	2008 calf of 1408	1123	NEWS049	Calf	N/A
143	01	31	2008	0918	NEWS20080131	30.88372	-81.17795	A	CT15SEUS08	0948	NEWS050		0.00
144	01	31	2008	1000	NEWS20080131	30.92435	-81.12206	B	CT16SEUS08	1022	NEWS051		0.57
145	01	31	2008	1000	NEWS20080131	30.92435	-81.12206	C	3411	1022	NEWS051		0.57
146	01	31	2008	1000	NEWS20080131	30.92435	-81.12206	D	3540	1022	NEWS051		0.57
147	01	31	2008	1000	NEWS20080131	30.92435	-81.12206	E	3579	1022	NEWS051		0.57
148	01	31	2008	1000	NEWS20080131	30.92435	-81.12206	1	3460	1022	NEWS051		0.57
149	01	31	2008	1030	NEWS20080131	30.98037	-81.14057	F	3230	1101	NEWS052		0.15
150	01	31	2008	1030	NEWS20080131	30.98037	-81.14057	G	CT07SEUS08	1101	NEWS052		0.15
151	01	31	2008	1030	NEWS20080131	30.98037	-81.14057	H	3115	1101	NEWS052		0.15
152	01	31	2008	1030	NEWS20080131	30.98037	-81.14057	I	2006 Calf of 2123	1101	NEWS052		0.15
153	01	31	2008	1133	NEWS20080131	31.08198	-81.19472	J	2007 Calf of 2614	1201	NEWS053	Yearling	0.09
154	01	31	2008	1133	NEWS20080131	31.08198	-81.19472	K	CT12SEUS08	1201	NEWS053		0.09
155	01	31	2008	1133	NEWS20080131	31.08198	-81.19472	L	3423	1201	NEWS053		0.09
156	01	31	2008	1133	NEWS20080131	31.08198	-81.19472	M	CT20SEUS08	1201	NEWS053		0.09
157	01	31	2008	1133	NEWS20080131	31.08198	-81.19472	N	3401	1201	NEWS053		0.09
158	01	31	2008	1133	NEWS20080131	31.08198	-81.19472	O	3314	1201	NEWS053		0.09
159	02	02	2008	0925	NEWS20080202	30.93785	-81.14970	A	CT19SEUS08	1003	NEWS054		N/A
160	02	02	2008	0925	NEWS20080202	30.93785	-81.14970	B	CT20SEUS08	1003	NEWS054		N/A
161	02	02	2008	0925	NEWS20080202	30.93785	-81.14970	C	3541	1003	NEWS054		N/A
162	02	02	2008	0925	NEWS20080202	30.93785	-81.14970	1	3230	1003	NEWS054		N/A
163	02	02	2008	1158	NEWS20080202	31.38338	-81.04835	D	3411	1227	NEWS055		0.00

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164	02	02	2008	1158	NEWS20080202	31.38338	-81.04835	E	BK01BOF07	1227	NEWS055		0.00
165	02	02	2008	1158	NEWS20080202	31.38338	-81.04835	F	CT06SEUS08	1227	NEWS055		0.00
166	02	02	2008	1259	NEWS20080202	31.47330	-80.99873	G	3040	1440	NEWS056		0.60
167	02	02	2008	1259	NEWS20080202	31.47330	-80.99873	H	3503	1440	NEWS056		0.60
168	02	02	2008	1259	NEWS20080202	31.47330	-80.99873	I	2427	1440	NEWS056		0.60
169	02	02	2008	1259	NEWS20080202	31.47330	-80.99873	J	3466	1440	NEWS056		0.60
170	02	02	2008	1329	NEWS20080202	31.47486	-80.98445	K	3333	1440	NEWS056	Entangled	N/A
171	02	02	2008	1441	NEWS20080202	31.47497	-80.60218	L	1245	1457	NEWS057	w/ Calf	0.48
172	02	02	2008	1441	NEWS20080202	31.47497	-80.60218	M	2008 calf of 1245	1457	NEWS057	Calf	0.48
173	02	02	2008	1619	NEWS20080202	31.42703	-81.04185	N	3540	N/A	N/A	Resight of sighting 2	N/A
174	02	02	2008	1619	NEWS20080202	31.42703	-81.04185	O	CT22SEUS08	N/A	N/A	Resight of sighting 2	N/A
175	02	02	2008	1619	NEWS20080202	31.42703	-81.04185	P	3411	N/A	N/A	Resight of sighting 2	N/A
176	02	02	2008	1619	NEWS20080202	31.42703	-81.04185	Q	2006 Calf of 2503	N/A	N/A	Resight of sighting 2	N/A
177	02	02	2008	1619	NEWS20080202	31.42703	-81.04185	2	BK01BOF07	N/A	N/A	Resight of sighting 2	N/A
178	02	02	2008	1626	NEWS20080202	31.45310	-81.04790	R	3503	1658	NEWS058		N/A
179	02	02	2008	1626	NEWS20080202	31.45310	-81.04790	S	3466	1658	NEWS058		N/A
180	02	02	2008	1626	NEWS20080202	31.45310	-81.04790	T	No ID Photos	1658	NEWS058	No ID Photos	N/A
181	02	02	2008	1638	NEWS20080202	31.54675	-80.91987	U	3314	1700	NEWS059		1.03
182	02	02	2008	1638	NEWS20080202	31.54675	-80.91987	V	2740	1700	NEWS059		1.03
183	02	02	2008	1638	NEWS20080202	31.54675	-80.91987	W	No ID Photos	1700	NEWS059	No ID Photos	1.03
184	02	07	2008	1042	NEWS20080207	31.08140	-81.13982	A	CT23SEUS08	1107	NEWS060		0.02
185	02	07	2008	1042	NEWS20080207	31.08140	-81.13982	B	3346	1107	NEWS060	Entangled	0.02
186	02	07	2008	1042	NEWS20080207	31.08140	-81.13982	C	CT24SEUS08	1107	NEWS060		0.02
187	02	07	2008	1133	NEWS20080207	31.19839	-81.17343	D	1408	1153	NEWS061	w/ Calf	0.92
188	02	07	2008	1133	NEWS20080207	31.19839	-81.17343	E	2008 Calf of 1408	1153	NEWS061	Calf	0.92
189	02	07	2008	1210	NEWS20080207	31.21698	-80.91788	F	3130	1227	NEWS062	w/ Calf	1.03
190	02	07	2008	1210	NEWS20080207	31.21698	-80.91788	G	2008 Calf of 3130	1227	NEWS062	Calf	1.03
191	02	07	2008	1328	NEWS20080207	31.36767	-81.00339	H	BK01pccs2003 (SE06BK10)	1356	NEWS063		0.95
192	02	07	2008	1336	NEWS20080207	31.37953	-80.86942	I	1245	1358	NEWS064	w/ Calf	0.25
193	02	07	2008	1336	NEWS20080207	31.37953	-80.86942	J	2008 Calf of 1245	1358	NEWS064	Calf	0.25
194	02	07	2008	1432	NEWS20080207	31.48675	-80.72688	K	1703	1456	NEWS065	w/ Calf	0.003
195	02	07	2008	1432	NEWS20080207	31.48675	-80.72688	L	2008 Calf of 1703	1456	NEWS065	Calf	0.003
196	02	08	2008	1027	NEWS20080208	31.03358	-81.05272	A	BK01pccs2003 (SE06BK10)	1048	NEWS066		0.00
197	02	08	2008	1053	NEWS20080208	31.08370	-81.19628	B	1408	1126	NEWS067	w/ Calf	0.18
198	02	08	2008	1053	NEWS20080208	31.08370	-81.19628	C	2008 Calf of 1408	1126	NEWS067	Calf	0.18
199	02	08	2008	1058	NEWS20080208	31.08512	-81.12914	D	CT27SEUS08	1130	NEWS068		0.27
200	02	08	2008	1103	NEWS20080208	31.08162	-81.05159	E	CT25SEUS08	1132	NEWS069		0.004
201	02	08	2008	1328	NEWS20080208	31.43318	-80.70450	F	BK07SEUS08	1348	NEWS070		0.00
202	02	08	2008	1328	NEWS20080208	31.43318	-80.70450	G	3230	1348	NEWS070		0.00
203	02	08	2008	1422	NEWS20080208	31.36587	-80.55145	H	3180	1441	NEWS071	w/ Calf	N/A

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204	02	08	2008	1422	NEWS20080208	31.36587	-80.55145	I	2008 Calf of 3180	1441	NEWS071	Calf	N/A
205	02	09	2008	0934	NEWS20080209	31.52587	-80.85368	A	No Photos	1010	NEWS072	No Photos	0.46
206	02	09	2008	0948	NEWS20080209	31.51678	-80.87333	B	1245	1013	NEWS073	w/ Calf	N/A
207	02	09	2008	0948	NEWS20080209	31.51678	-80.87333	C	2008 Calf of 1245	1013	NEWS073	Calf	N/A
208	02	09	2008	1119	NEWS20080209	31.33198	-80.96313	D	CT19SEUS08	1151	NEWS074		0.09
209	02	09	2008	1119	NEWS20080209	31.33198	-80.96313	E	2006 Calf of 1503	1151	NEWS074		0.09
210	02	11	2008	1406	NEWS20080211	31.02222	-81.13157	A	1622	1433	NEWS075	w/ Calf	0.69
211	02	11	2008	1406	NEWS20080211	31.02222	-81.13157	B	2008 Calf of 1622	1433	NEWS075	Calf	0.69
212	02	11	2008	1440	NEWS20080211	31.09023	-81.18723	C	CT06SEUS08	1500	NEWS076		0.41
213	02	11	2008	1440	NEWS20080211	31.09023	-81.18723	D	3442	1500	NEWS076		0.41
214	02	11	2008	1516	NEWS20080211	31.14022	-81.01683	E	2007 Calf of 2642	1531	NEWS077	Yearling	0.39
215	02	11	2008	1516	NEWS20080211	31.14022	-81.01683	F	CT27SEUS08	1531	NEWS077		0.39
216	02	12	2008	1252	NEWS20080212	31.38902	-81.07092	A	2007 Calf of 2642	1323	NEWS078	Yearling	0.34
217	02	12	2008	1252	NEWS20080212	31.38902	-81.07092	B	CT27SEUS08	1323	NEWS078		0.34
218	02	14	2008	1147	NEWS20080214	31.52977	-80.70550	A	1245	1225	NEWS079	w/ Calf	0.34
219	02	14	2008	1147	NEWS20080214	31.52977	-80.70550	B	2008 Calf of 1245	1225	NEWS079	Calf	0.34
220	02	14	2008	1153	NEWS20080214	31.52421	-80.60732	C	1934	1225	NEWS080		0.20
221	02	14	2008	1220	NEWS20080214	31.47257	-81.04227	D	3180	1235	NEWS081	Seen w/o 2008 Calf	0.54
222	02	14	2008	1220	NEWS20080214	31.47257	-81.04227	E	CT28SEUS08	1235	NEWS081		0.54
223	02	14	2008	1355	NEWS20080214	31.29928	-80.97945	F	1408	1415	NEWS082	w/ Calf	0.67
224	02	14	2008	1355	NEWS20080214	31.29928	-80.97945	G	2008 Calf of 1408	1415	NEWS082	Calf	0.67
225	02	14	2008	1442	NEWS20080214	31.18652	-80.98286	H	3130	1457	NEWS083	w/ Calf	0.91
226	02	14	2008	1442	NEWS20080214	31.18652	-80.98286	I	2008 Calf of 3130	1457	NEWS083	Calf	0.91
227	02	14	2008	1507	NEWS20080214	31.13343	-81.05383	J	2040	1525	NEWS084	w/ Calf	0.14
228	02	14	2008	1507	NEWS20080214	31.13343	-81.05383	K	2008 Calf of 2040	1525	NEWS084	Calf	0.14
229	02	14	2008	1551	NEWS20080214	31.02883	-81.32463	L	1622	1605	NEWS085	w/ Calf	0.24
230	02	14	2008	1551	NEWS20080214	31.02883	-81.32463	M	2008 Calf of 1622	1605	NEWS085	Calf	0.24
231	02	14	2008	1708	NEWS20080214	30.89442	-81.21887	N	1703	1718	NEWS086	w/ Calf	0.62
232	02	14	2008	1708	NEWS20080214	30.89442	-81.21887	O	2008 Calf of 1703	1718	NEWS086	Calf	0.62
233	02	15	2008	1118	NEWS20080215	31.29142	-80.94247	A	3130	1152	NEWS087	w/ Calf	0.44
234	02	15	2008	1118	NEWS20080215	31.29142	-80.94247	B	2008 Calf of 3130	1152	NEWS087	Calf	0.44
235	02	15	2008	1129	NEWS20080215	31.28870	-80.93993	C	1408	1152	NEWS087	w/ Calf	N/A
236	02	15	2008	1129	NEWS20080215	31.28870	-80.93993	D	2008 Calf of 1408	1152	NEWS087	Calf	N/A
237	02	15	2008	1213	NEWS20080215	31.16703	-81.05385	E	1934	1227	NEWS088		1.01
238	02	15	2008	1213	NEWS20080215	31.16703	-81.05385	F	3245	1227	NEWS088		1.01
239	02	15	2008	1313	NEWS20080215	31.04882	-81.20390	G	3466	1342	NEWS089		0.94
240	02	15	2008	1313	NEWS20080215	31.04882	-81.20390	H	SE07CT18	1342	NEWS089		0.94
241	02	15	2008	1313	NEWS20080215	31.04882	-81.20390	I	3460	1342	NEWS089		0.94
242	02	15	2008	1313	NEWS20080215	31.04882	-81.20390	J	SE07CT07	1342	NEWS089		0.94
243	02	15	2008	1313	NEWS20080215	31.04882	-81.20390	K	3579	1342	NEWS089		0.94
244	02	15	2008	1506	NEWS20080215	31.10927	-81.14828	L	1934	N/A	N/A	Resight of sighting 3	N/A

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245	02	15	2008	1506	NEWS20080215	31.10927	-81.14828	M	3245	N/A	N/A	Resight of sighting 3	N/A
246	02	16	2008	0926	NEWS20080216	31.54938	-80.95603	A	1706	0940	NEWS090		0.76
247	02	16	2008	0926	NEWS20080216	31.54938	-80.95603	B	2470	0940	NEWS090		0.76
248	02	16	2008	0926	NEWS20080216	31.54938	-80.95603	C	2007 Calf of 2642	0940	NEWS090	Yearling	0.76
249	02	16	2008	1131	NEWS20080216	31.28710	-80.97484	D	3130	1151	NEWS091	w/ Calf	0.18
250	02	16	2008	1131	NEWS20080216	31.28710	-80.97484	E	2008 Calf of 3130	1151	NEWS091	Calf	0.18
251	02	16	2008	1137	NEWS20080216	31.28588	-81.01610	F	2006 Calf of 1946	1158	NEWS092		0.00
252	02	16	2008	1209	NEWS20080216	31.23360	-80.92554	G	1408	1216	NEWS093	w/ Calf	0.00
253	02	16	2008	1209	NEWS20080216	31.23360	-80.92554	H	2008 Calf of 1408	1216	NEWS093	Calf	0.00
254	02	16	2008	1240	NEWS20080216	31.15193	-81.15200	I	SE07BK08	1306	NEWS094		1.90
255	02	16	2008	1240	NEWS20080216	31.15193	-81.15200	J	SE07CT10	1306	NEWS094		1.90
256	02	16	2008	1240	NEWS20080216	31.15193	-81.15200	K	3340	1306	NEWS094		1.90
257	02	16	2008	1251	NEWS20080216	31.19378	-81.18418	L	2040	1308	NEWS095	w/ Calf	0.62
258	02	16	2008	1251	NEWS20080216	31.19378	-81.18418	M	2008 Calf of 2040	1308	NEWS095	Calf	0.62
259	02	16	2008	1351	NEWS20080216	31.01068	-81.20365	N	3150	1410	NEWS096		1.35
260	02	16	2008	1351	NEWS20080216	31.01068	-81.20365	O	3460	1410	NEWS096		1.35
261	02	16	2008	1351	NEWS20080216	31.01068	-81.20365	P	2608	1410	NEWS096		1.35
262	02	16	2008	1413	NEWS20080216	31.01148	-81.06633	Q	1802	1422	NEWS097	w/ Calf	1.30
263	02	16	2008	1413	NEWS20080216	31.01148	-81.06633	R	2008 Calf of 1802	1422	NEWS097	Calf	1.30
264	02	16	2008	1444	NEWS20080216	30.98758	-81.19598	S	3150	1517	NEWS098		0.67
265	02	16	2008	1444	NEWS20080216	30.98758	-81.19598	T	2608	1517	NEWS098		0.67
266	02	16	2008	1454	NEWS20080216	30.97318	-81.19905	U	3245	1518	NEWS099		N/A
267	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	V	3245	1629	NEWS100		1.12
268	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	W	1934	1629	NEWS100		1.12
269	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	X	3420	1629	NEWS100		1.12
270	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	Y	CT10SEUS08	1629	NEWS100		1.12
271	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	Z	SE07BK11	1629	NEWS100		1.12
272	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	AA	2608	1629	NEWS100		1.12
273	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	BB	3150	1629	NEWS100		1.12
274	02	16	2008	1555	NEWS20080216	30.95202	-81.19537	CC	2215	1629	NEWS100		1.12
275	02	16	2008	1646	NEWS20080216	30.90405	-81.21542	DD	BK03BOF07	1654	NEWS101		1.20
276	02	16	2008	1658	NEWS20080216	30.90912	-81.24599	EE	1703	1702	NEWS102	w/ Calf	1.37
277	02	16	2008	1658	NEWS20080216	30.90912	-81.24599	FF	2008 Calf of 1703	1702	NEWS102	Calf	1.37
278	02	20	2008	0921	NEWS20080220	30.86847	-81.30267	A	2753	0942	NEWS103	w/ Calf	0.94
279	02	20	2008	0921	NEWS20080220	30.86847	-81.30267	B	2008 Calf of 2753	0942	NEWS103	Calf	0.94
280	02	20	2008	1015	NEWS20080220	30.98747	-81.17436	C	3180	1055	NEWS105	Seen w/o 2008 Calf	0.25
281	02	20	2008	1015	NEWS20080220	30.98747	-81.17436	D	2040	1055	NEWS105		0.25
282	02	20	2008	1015	NEWS20080220	30.98747	-81.17436	E	2608	1055	NEWS105		0.25
283	02	20	2008	1039	NEWS20080220	31.02987	-81.18180	F	2040	1102	NEWS104	w/ Calf	N/A
284	02	20	2008	1039	NEWS20080220	31.02987	-81.18180	G	2008 Calf of 2040	1102	NEWS104	Calf	N/A
285	02	20	2008	1124	NEWS20080220	31.04387	-81.30095	H	2330	1138	NEWS106	w/ Calf	0.48

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286	02	20	2008	1124	NEWS20080220	31.04387	-81.30095	I	2008 Calf of 2330	1138	NEWS106	Calf	0.48
287	02	20	2008	1147	NEWS20080220	31.08913	-81.01238	J	BK01pccs2003 (SE06BK10)	1201	NEWS107		0.34
288	02	20	2008	1147	NEWS20080220	31.08913	-81.01238	K	3157	1201	NEWS107		0.34
289	02	20	2008	1216	NEWS20080220	31.15537	-81.17512	L	1408	1229	NEWS108	w/ Calf	1.29
290	02	20	2008	1216	NEWS20080220	31.15537	-81.17512	M	2008 Calf of 1408	1229	NEWS108	Calf	1.29
291	02	20	2008	1457	NEWS20080220	31.43670	-80.63969	N	3541	1538	NEWS109		N/A
292	02	20	2008	1457	NEWS20080220	31.43670	-80.63969	O	2006 Calf of 2503	1538	NEWS109		N/A
293	02	20	2008	1518	NEWS20080220	31.43848	-80.73544	P	BK09SEUS08	1540	NEWS110		0.29
294	02	20	2008	1518	NEWS20080220	31.43848	-80.73544	Q	CT12SEUS08	1540	NEWS110		0.29
295	02	20	2008	1551	NEWS20080220	31.48668	-81.08517	R	CT02BOF2004	1606	NEWS111		0.23
296	02	20	2008	1551	NEWS20080220	31.48668	-81.08517	S	1507	1606	NEWS111		0.23
297	02	20	2008	1551	NEWS20080220	31.48668	-81.08517	T	BK10SEUS08	1606	NEWS111		0.23
298	02	21	2008	0922	NEWS20080221	31.02007	-81.26761	A	1622	0943	NEWS112	w/ Calf	N/A
299	02	21	2008	0922	NEWS20080221	31.02007	-81.26761	B	2008 Calf of 1622	0943	NEWS112	Calf	N/A
300	02	21	2008	1032	NEWS20080221	31.38351	-80.82748	C	3293	1050	NEWS113	w/ Calf	N/A
301	02	21	2008	1032	NEWS20080221	31.38351	-80.82748	D	2008 Calf of 3293	1050	NEWS113	Calf	N/A
302	02	21	2008	1119	NEWS20080221	31.21863	-81.16113	E	2040	1137	NEWS114	w/ Calf	0.85
303	02	21	2008	1119	NEWS20080221	31.21863	-81.16113	F	2008 Calf of 2040	1137	NEWS114	Calf	0.85
304	02	21	2008	1133	NEWS20080221	31.24250	-81.00245	G	3020	1155	NEWS115		0.56
305	02	21	2008	1133	NEWS20080221	31.24250	-81.00245	H	3180	1155	NEWS115	Seen w/o 2008 Calf	0.56
306	02	21	2008	1151	NEWS20080221	31.19326	-81.14908	I	3260	1201	NEWS116		0.56
307	02	21	2008	1332	NEWS20080221	30.87640	-81.11091	J	3103	1414	NEWS117		0.44
308	02	21	2008	1332	NEWS20080221	30.87640	-81.11091	K	3157	1414	NEWS117		0.44
309	02	21	2008	1332	NEWS20080221	30.87640	-81.11091	L	BK01pccs2003 (SE06BK10)	1414	NEWS117		0.44
310	02	21	2008	1332	NEWS20080221	30.87640	-81.11091	M	2042	1414	NEWS117		0.44
311	02	21	2008	1439	NEWS20080221	31.08298	-80.87460	N	3330	1512	NEWS118		0.00
312	02	21	2008	1439	NEWS20080221	31.08298	-80.87460	O	2007 Calf of 2614	1512	NEWS118	Yearling	0.00
313	02	21	2008	1439	NEWS20080221	31.08298	-80.87460	P	BK11SEUS08	1512	NEWS118		0.00
314	02	21	2008	1439	NEWS20080221	31.08298	-80.87460	Q	BK12SEUS08	1512	NEWS118		0.00
315	02	21	2008	1458	NEWS20080221	31.09630	-80.89345	R	1429	1515	NEWS119		N/A
316	02	24	2008	0930	NEWS20080224	30.87575	-81.02886	A	1812	0941	NEWS120	w/ Calf	0.46
317	02	24	2008	0930	NEWS20080224	30.87575	-81.02886	B	2008 Calf of 1812	0941	NEWS120	Calf	0.46
318	02	24	2008	1015	NEWS20080224	30.98342	-81.24418	C	CT15SEUS08	1018	NEWS121		0.00
319	02	24	2008	1015	NEWS20080224	30.98342	-81.24418	D	3010	1018	NEWS121		0.00
320	02	24	2008	1048	NEWS20080224	31.03358	-81.21245	E	1308	1052	NEWS122	w/ Calf	0.00
321	02	24	2008	1048	NEWS20080224	31.03358	-81.21245	F	2008 Calf of 1308	1052	NEWS122	Calf	0.00
322	02	24	2008	1123	NEWS20080224	31.13353	-80.88540	G	3020	1125	NEWS123		0.00
323	02	24	2008	1229	NEWS20080224	31.29712	-80.97997	H	2040	1231	NEWS124	w/ Calf	0.83
324	02	24	2008	1229	NEWS20080224	31.29712	-80.97997	I	2008 Calf of 2040	1231	NEWS124	Calf	0.83
325	02	24	2008	1341	NEWS20080224	31.41967	-81.06915	J	CT24SEUS08	1356	NEWS125		0.86
326	02	24	2008	1341	NEWS20080224	31.41967	-81.06915	K	3120	1356	NEWS125		0.86

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327	02	24	2008	1341	NEWS20080224	31.41967	-81.06915	L	BK11SEUS08	1356	NEWS125		0.86
328	02	24	2008	1341	NEWS20080224	31.41967	-81.06915	M	2427	1356	NEWS125		0.86
329	02	24	2008	1356	NEWS20080224	31.42673	-81.07932	N	3330	1358	NEWS126		N/A
330	02	24	2008	1359	NEWS20080224	31.42337	-81.08233	O	2007 Calf of 2614	1412	NEWS127	Yearling	N/A
331	02	24	2008	1359	NEWS20080224	31.42337	-81.08233	P	BK12SEUS08	1412	NEWS127		N/A
332	02	24	2008	1359	NEWS20080224	31.42337	-81.08233	Q	3503	1412	NEWS127		N/A
333	02	24	2008	1359	NEWS20080224	31.42337	-81.08233	R	3460	1412	NEWS127		N/A
334	02	24	2008	1359	NEWS20080224	31.42337	-81.08233	S	3346	1412	NEWS127	Entangled	N/A
335	02	24	2008	1359	NEWS20080224	31.42337	-81.08233	T	CT11SEUS08	1412	NEWS127		N/A
336	02	24	2008	1359	NEWS20080224	31.42337	-81.08233	U	2006 Calf of 2503	1412	NEWS127		N/A
337	02	29	2008	0933	NEWS20080229	31.53180	-81.03547	A	BK09SEUS08	1012	NEWS128		0.20
338	02	29	2008	0933	NEWS20080229	31.53180	-81.03547	B	1321	1012	NEWS128		0.20
339	02	29	2008	1221	NEWS20080229	31.16688	-81.06834	C	1327	1303	NEWS129		1.03
340	02	29	2008	1221	NEWS20080229	31.16688	-81.06834	D	3150	1303	NEWS129		1.03
341	02	29	2008	1241	NEWS20080229	31.16967	-81.08357	E	SE07BK16	1306	NEWS130		N/A
342	02	29	2008	1342	NEWS20080229	30.99253	-81.27417	F	1632	1413	NEWS131		2.45
343	02	29	2008	1342	NEWS20080229	30.99253	-81.27417	G	1227	1413	NEWS131		2.45
344	02	29	2008	1354	NEWS20080229	31.01448	-81.27628	H	CT15SEUS08	1416	NEWS132		N/A
345	02	29	2008	1354	NEWS20080229	31.01448	-81.27628	I	3010	1416	NEWS132		N/A
346	02	29	2008	1432	NEWS20080229	30.97405	-81.33585	J	2753	1509	NEWS133	w/ Calf; Cow and Calf w/ 2 adults	0.58
347	02	29	2008	1432	NEWS20080229	30.97405	-81.33585	K	2008 Calf of 2753	1509	NEWS133	Calf; Cow and Calf w/ 2 adults	0.58
348	02	29	2008	1432	NEWS20080229	30.97405	-81.33585	L	2042	1509	NEWS133	Adult w/ Cow and Calf	0.58
349	02	29	2008	1432	NEWS20080229	30.97405	-81.33585	M	3103	1509	NEWS133	Adult w/ Cow and Calf	0.58
350	02	29	2008	1542	NEWS20080229	30.95547	-81.28527	N	1227	N/A	N/A	Resight of sighting 4	1.33
351	02	29	2008	1542	NEWS20080229	30.95547	-81.28527	O	1632	N/A	N/A	Resight of sighting 4	1.33
352	03	01	2008	0925	NEWS20080301	31.53710	-81.05291	A	1408	0942	NEWS134	w/ Calf	0.21
353	03	01	2008	0925	NEWS20080301	31.53710	-81.05291	B	2008 Calf of 1408	0942	NEWS134	Calf	0.21
354	03	01	2008	1143	NEWS20080301	31.19408	-81.21242	C	3103	1203	NEWS135		0.58
355	03	01	2008	1143	NEWS20080301	31.19408	-81.21242	D	2042	1203	NEWS135		0.58
356	03	01	2008	1327	NEWS20080301	30.94140	-81.18974	E	2753	1338	NEWS136	w/ Calf	0.49
357	03	01	2008	1327	NEWS20080301	30.94140	-81.18974	F	2008 Calf of 2753	1338	NEWS136	Calf	0.49
358	03	01	2008	1351	NEWS20080301	30.90663	-80.88707	G	CT11SEUS08	1409	NEWS137		1.37
359	03	01	2008	1351	NEWS20080301	30.90663	-80.88707	H	2406	1409	NEWS137		1.37
360	03	01	2008	1351	NEWS20080301	30.90663	-80.88707	I	CT10SEUS08	1409	NEWS137		1.37
361	03	02	2008	1001	NEWS20080302	30.97645	-81.10345	A	1632	1018	NEWS138		0.41
362	03	02	2008	1057	NEWS20080302	31.08233	-80.95536	B	CT11SEUS08	1112	NEWS139		0.00
363	03	02	2008	1057	NEWS20080302	31.08233	-80.95536	C	2406	1112	NEWS139		0.00
364	03	02	2008	1057	NEWS20080302	31.08233	-80.95536	D	CT02BOF2004	1112	NEWS139		0.00
365	03	02	2008	1057	NEWS20080302	31.08233	-80.95536	E	BK11SEUS08	1112	NEWS139		0.00
366	03	02	2008	1057	NEWS20080302	31.08233	-80.95536	F	CT10SEUS08	1112	NEWS139		0.00

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367	03	02	2008	1057	NEWS20080302	31.08233	-80.95536	G	No ID Photos	1112	NEWS139	No ID Photos	0.00
368	03	02	2008	1115	NEWS20080302	31.06768	-80.94975	H	3503	1121	NEWS140		0.95
369	03	02	2008	1138	NEWS20080302	31.11372	-80.93670	I	2795	1152	NEWS141		N/A
370	03	02	2008	1138	NEWS20080302	31.11372	-80.93670	J	1428	1152	NEWS141		N/A
371	03	02	2008	1138	NEWS20080302	31.11372	-80.93670	K	CT42 (CT34SEUS08)	1152	NEWS141		N/A
372	03	02	2008	1343	NEWS20080302	31.36822	-80.88973	L	3293	1345	NEWS142	w/ Calf	0.91
373	03	02	2008	1343	NEWS20080302	31.36822	-80.88973	M	2008 Calf of 3293	1345	NEWS142	Calf	0.91
374	03	02	2008	1410	NEWS20080302	31.43268	-81.04752	N	3130	1414	NEWS143	w/ Calf	0.08
375	03	02	2008	1410	NEWS20080302	31.43268	-81.04752	O	2008 Calf of 3130	1414	NEWS143	Calf	0.08
376	03	02	2008	1455	NEWS20080302	31.55239	-80.97208	P	3103	1505	NEWS144		1.12
377	03	02	2008	1455	NEWS20080302	31.55239	-80.97208	Q	2042	1505	NEWS144		1.12
378	03	02	2008	1455	NEWS20080302	31.55239	-80.97208	R	BK12SEUS08	1505	NEWS144		1.12
379	03	06	2008	0948	NEWS20080306	30.92978	-81.06851	A	1703	1009	NEWS145	w/ Calf	0.23
380	03	06	2008	0948	NEWS20080306	30.92978	-81.06851	B	2008 Calf of 1703	1009	NEWS145	Calf	0.23
381	03	06	2008	1259	NEWS20080306	31.32042	-81.17220	C	3292	1302	NEWS146	w/ Calf	0.78
382	03	06	2008	1259	NEWS20080306	31.32042	-81.17220	D	2008 Calf of 3292	1302	NEWS146	Calf	0.78
383	03	06	2008	1405	NEWS20080306	31.48910	-80.70335	E	3323	1445	NEWS147		0.33
384	03	06	2008	1417	NEWS20080306	31.49765	-80.68591	F	3120	1448	NEWS148		N/A
385	03	06	2008	1417	NEWS20080306	31.49765	-80.68591	G	1901	1448	NEWS148		N/A
386	03	06	2008	1417	NEWS20080306	31.49765	-80.68591	H	1317	1448	NEWS148		N/A
387	03	06	2008	1417	NEWS20080306	31.49765	-80.68591	I	3330	1448	NEWS148		N/A
388	03	06	2008	1417	NEWS20080306	31.49765	-80.68591	J	BK14SEUS08	1448	NEWS148		N/A
389	03	06	2008	1417	NEWS20080306	31.49765	-80.68591	K	No ID Photos	1448	NEWS148	No ID Photos	N/A
390	03	10	2008	1319	NEWS20080310	31.34366	-81.04497	A	1243	1331	NEWS149	w/ Calf	0.62
391	03	10	2008	1319	NEWS20080310	31.34366	-81.04497	B	2008 Calf of 1243	1331	NEWS149	Calf	0.62
392	03	11	2008	1033	NEWS20080311	31.37830	-81.08442	A	2790	1052	NEWS150	w/ Calf	0.38
393	03	11	2008	1033	NEWS20080311	31.37830	-81.08442	B	2008 Calf of 2790	1052	NEWS150	Calf	0.38
394	03	11	2008	1122	NEWS20080311	31.30586	-81.04683	C	1812	1137	NEWS151	w/ Calf	1.20
395	03	11	2008	1122	NEWS20080311	31.30586	-81.04683	D	2008 Calf of 1812	1137	NEWS151	Calf	1.20
396	03	11	2008	1322	NEWS20080311	31.10906	-80.97916	E	1632	1337	NEWS152		1.40
397	03	11	2008	1448	NEWS20080311	30.95611	-81.17165	F	1308	1459	NEWS153	w/ Calf	1.40
398	03	11	2008	1448	NEWS20080311	30.95611	-81.17165	G	2008 Calf of 1308	1459	NEWS153	Calf	1.40
399	03	13	2008	1313	NEWS20080313	31.10595	-81.16675	A	1703	1324	NEWS154	w/ Calf	1.35
400	03	13	2008	1313	NEWS20080313	31.10595	-81.16675	B	2008 Calf of 1703	1324	NEWS154	Calf	1.35
401	03	22	2008	1536	NEWS20080322	30.92707	-81.11128	A	1812	1554	NEWS155	w/ Calf	0.34
402	03	22	2008	1536	NEWS20080322	30.92707	-81.11128	B	2008 Calf of 1812	1554	NEWS155	Calf	0.34
403	03	26	2008	1236	NEWS20080326	31.08540	-81.15312	A	3020	1252	NEWS156	w/ Calf	0.05
404	03	26	2008	1236	NEWS20080326	31.08540	-81.15312	B	2008 Calf of 3020	1252	NEWS156	Calf	0.05
405	03	27	2008	953	NEWS20080327	31.49332	-80.97282	A	1703	1011	NEWS157	w/ Calf	0.52
406	03	27	2008	953	NEWS20080327	31.49332	-80.97282	B	2008 Calf of 1703	1011	NEWS157	Calf	0.52
407	03	27	2008	1408	NEWS20080327	30.87448	-81.33048	C	BK16SEUS08	1426	NEWS158		0.56
408	03	28	2008	1025	NEWS20080328	31.38760	-80.69375	A	1156	1057	NEWS159		0.00

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409	03	28	2008	1025	NEWS20080328	31.38760	-80.69375	B	1150	1057	NEWS159		0.00
410	03	28	2008	1025	NEWS20080328	31.38760	-80.69375	C	1616	1057	NEWS159		0.00
411	03	28	2008	1335	NEWS20080328	30.96796	-81.08855	D	BK17SEUS08	1402	NEWS160		0.98
412	03	28	2008	1335	NEWS20080328	30.96796	-81.08855	E	3110	1402	NEWS160		0.98
413	03	28	2008	1335	NEWS20080328	30.96796	-81.08855	F	3060 (BK33)	1402	NEWS160		0.98
414	03	28	2008	1335	NEWS20080328	30.96796	-81.08855	G	2615	1402	NEWS160		0.98

Appendix 3: Summary of leatherback turtle sightings during the 2007-2008 NEWS right whale surveys.

Survey Date	Time (GMT)	Latitude	Longitude	Number of Leatherback Turtles Sighted
2-Dec-07	155139	31.53275	-80.87257	1
2-Dec-07	163909	31.43325	-80.73818	1
2-Dec-07	164337	31.40482	-80.62331	1
2-Dec-07	164640	31.38355	-80.69755	1
2-Dec-07	170609	31.38350	-81.19278	1
2-Dec-07	170639	31.38350	-81.20901	1
2-Dec-07	181109	31.18385	-80.80618	1
2-Dec-07	195208	31.08356	-81.12753	1
2-Dec-07	203937	30.98328	-81.33362	1
9-Dec-07	153850	31.53325	-80.80245	1
9-Dec-07	155921	31.48402	-80.92425	1
9-Dec-07	160005	31.48405	-80.94884	1
9-Dec-07	162154	31.43332	-80.81315	1
9-Dec-07	163851	31.38402	-80.93602	1
9-Dec-07	164450	31.38379	-81.13309	1
9-Dec-07	164530	31.38388	-81.15528	1
9-Dec-07	164550	31.38383	-81.16631	1
9-Dec-07	170221	31.33325	-80.86893	1
9-Dec-07	200551	31.03292	-81.31081	1
10-Dec-07	180212	30.88163	-81.34792	1
10-Dec-07	180859	30.88285	-81.12601	1
10-Dec-07	184417	30.98245	-81.30220	1
10-Dec-07	184433	30.98240	-81.29342	1
10-Dec-07	190630	31.03430	-80.90754	1
10-Dec-07	195131	31.13390	-80.90900	1
10-Dec-07	201200	31.18310	-81.17290	1
10-Dec-07	203001	31.23393	-80.80112	1
10-Dec-07	203101	31.23405	-80.83366	1
11-Dec-07	195256	31.08313	-81.24699	1
11-Dec-07	200401	31.08309	-80.89053	1
14-Dec-07	161101	31.48426	-80.80666	1
14-Dec-07	161421	31.48422	-80.91697	1
14-Dec-07	161435	31.48423	-80.92465	1
14-Dec-07	163302	31.43327	-80.94939	1
14-Dec-07	163644	31.43325	-80.82751	1
14-Dec-07	163937	31.43318	-80.73350	1
14-Dec-07	163953	31.43328	-80.72473	2
14-Dec-07	170804	31.33318	-81.19423	1
14-Dec-07	170902	31.33307	-81.16212	2
14-Dec-07	170932	31.33320	-81.14545	1
14-Dec-07	174802	31.23356	-81.23192	1

Survey Date	Time (GMT)	Latitude	Longitude	Number of Leatherback Turtles Sighted
14-Dec-07	182046	31.18410	-81.22698	1
14-Dec-07	190803	31.03283	-81.32197	1
14-Dec-07	194847	30.93292	-81.31918	1
18-Dec-07	155745	31.53347	-80.72920	1
18-Dec-07	163731	31.43332	-80.82495	1
18-Dec-07	174933	31.28400	-80.87646	1
19-Dec-07	163646	31.13420	-81.27513	1
19-Dec-07	165016	31.18325	-81.01355	1
19-Dec-07	171216	31.23426	-81.08839	1
19-Dec-07	172847	31.28335	-80.98025	1
19-Dec-07	173047	31.28327	-80.91468	1
19-Dec-07	174732	31.33438	-80.88418	1
19-Dec-07	174850	31.33432	-80.92688	1
19-Dec-07	180747	31.38313	-81.01643	1
19-Dec-07	181325	31.38340	-80.83238	1
19-Dec-07	181429	31.38321	-80.79740	1
19-Dec-07	182818	31.43428	-80.83850	1
19-Dec-07	185347	31.48345	-80.80209	1
19-Dec-07	185417	31.48342	-80.78591	1
19-Dec-07	190818	31.53420	-80.72501	1
19-Dec-07	191046	31.53438	-80.80582	1
20-Dec-07	173148	31.18298	-81.21750	1
20-Dec-07	173218	31.18293	-81.20110	1
20-Dec-07	194050	31.43378	-80.97144	1
20-Dec-07	194322	31.43378	-81.06018	1
23-Dec-07	190732	31.03438	-81.15612	2
23-Dec-07	192357	31.08337	-81.13573	1
23-Dec-07	200405	31.13413	-81.18260	1
23-Dec-07	204041	31.23435	-81.04267	1
27-Dec-07	174228	30.91645	-80.77071	1
27-Dec-07	183523	31.03380	-81.16158	1
27-Dec-07	183653	31.03380	-81.20959	1
27-Dec-07	190046	31.08328	-81.15685	1
27-Dec-07	194023	31.13330	-81.19803	1
27-Dec-07	202053	31.18310	-80.85397	1
28-Dec-07	182047	30.88295	-81.05747	1
28-Dec-07	194017	31.02127	-81.11768	1
28-Dec-07	194231	31.03415	-81.15207	1
28-Dec-07	210050	31.18295	-81.25881	1
28-Dec-07	210638	31.18332	-81.07088	1
28-Dec-07	212920	31.23370	-81.06770	1
31-Dec-07	161906	31.43290	-81.15493	1

Survey Date	Time (GMT)	Latitude	Longitude	Number of Leatherback Turtles Sighted
31-Dec-07	162054	31.43327	-81.09633	1
31-Dec-07	164954	31.28373	-81.17301	1
06-Jan-08	195511	31.08320	-81.14920	1
06-Jan-08	203735	31.18347	-80.91282	1
07-Jan-08	185751	31.03405	-81.08942	1
07-Jan-08	194123	31.13393	-81.15442	1
07-Jan-08	203218	31.28303	-81.15817	1
07-Jan-08	204551	31.28283	-80.71958	1
08-Jan-08	192414	31.38410	-81.01895	1
08-Jan-08	210816	31.23323	-80.99718	1
09-Jan-08	174755	31.28382	-81.01791	1
10-Jan-08	164555	31.13573	-81.17159	1
10-Jan-08	194927	31.47748	-81.18693	1
10-Jan-08	202555	31.53400	-80.63399	1
24-Jan-08	193953	31.43362	-80.82263	1
29-Jan-08	181324	31.38575	-80.96923	1
08-Feb-08	170142	31.18322	-80.74663	1
08-Feb-08	173142	31.28320	-80.99148	1
20-Feb-08	154518	31.03278	-81.18082	1
20-Feb-08	155641	30.98317	-80.88427	1
20-Feb-08	182627	31.18408	-80.97382	1
20-Feb-08	192158	31.33388	-80.87358	1
13-Mar-08	183402	30.88332	-80.85042	1