



FINAL REPORT TO  
GEORGIA DEPARTMENT OF NATURAL RESOURCES

NORTHERN EARLY WARNING SYSTEM  
RIGHT WHALE SURVEYS  
2003 – 2004 SEASON

August 5, 2004

Submitted by:

WILDLIFE TRUST  
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## 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. The area designated as the Southeastern United States Critical Habitat (SEUS) by 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 Part 226). Minimizing sources of human-caused death, injury and disturbance is the first objective of the 1991 northern right whale (*Eubalaena glacialis*) recovery plan as well as the updated draft recovery plan (NMFS 1991, 2001). Within this objective, reducing ships strikes is the first point addressed. Vessel collisions are the greatest threat to right whale survival. The SEUS calving ground includes entrances to four major shipping channels, resulting in frequent usage of these waters by large commercial and military vessels. In hopes of eliminating the risk of collision, the Early Warning System (EWS) was created to alert military and commercial vessels in the area of the presence of right whales. Early Warning System surveys were initiated in 1994 to cover areas of high whale density along the coastline from Brunswick, Georgia to St. Augustine, Florida. Data collected since that time indicates that right whales regularly utilize waters outside of the initial EWS study area. In 2002, NMFS redesigned the EWS system to include two additional survey areas to the north and south of the primary EWS coverage area. This survey effort covers the waters to the north of the original EWS area, referred to as the Northern Early Warning System (NEWS).

The prioritized objectives of this study were to: locate right whales in their winter calving area and report those locations in near-real time to mariners operating commercial, military, and other vessels in those areas so they may elect to take actions to reduce the likelihood of collisions with right whales; determine the spatial and temporal distribution of right whales and ships occurring in the study area; and determine the number of calves produced by the population. This report examines the results of the Wildlife Trust aerial survey efforts within the Northern Early Warning System (NEWS) survey area for the 2003/2004 calving season.

## Methods

### *Study Area*

The Northern Early Warning System (NEWS) survey season began on 01 December, 2003 and concluded on 31 March, 2004. The NEWS survey area for the 2003/2004 season extended from the northern end of Sapelo Island, GA to mid Cumberland Island, GA, and out to approximately 32.4 nautical miles offshore. Fourteen east/west transect lines of varied lengths (28.8 – 32.4 nm) were flown at 3nm intervals (Figure 1). The complete survey consisted of 442.8 nm of trackline (Table 1), not including miles flown in transit to, from, and between transect lines. The survey aircraft departed from Malcolm McKinnon airport on St. Simons Island, GA and returned to the same airfield during each normal survey day. A complete survey took approximately 5 hours to finish without any whale sightings.

### *Aerial Surveys*

Surveys were scheduled to be flown daily from 01 December 2003 through 31 March 2004, weather permitting, under VFR (visual flight rules) conditions. Surveys were conducted in a NOAA owned and operated DeHaviland Twin Otter aircraft. The aircraft was equipped with Global Positioning System navigation aids, radar, aviation VHF radio, marine VHF radio, a life raft, PFDs, survival suits, flares, EPIRB, and a satellite telephone. Additionally, individually registered GPIRBs, knives, streamers, and strobes were issued to the observers. Flight protocols also included mandatory PFD usage on all flights, and the wearing of Nomex flight suits. All observers were also required to complete emergency egress training prior to the start of the survey season.

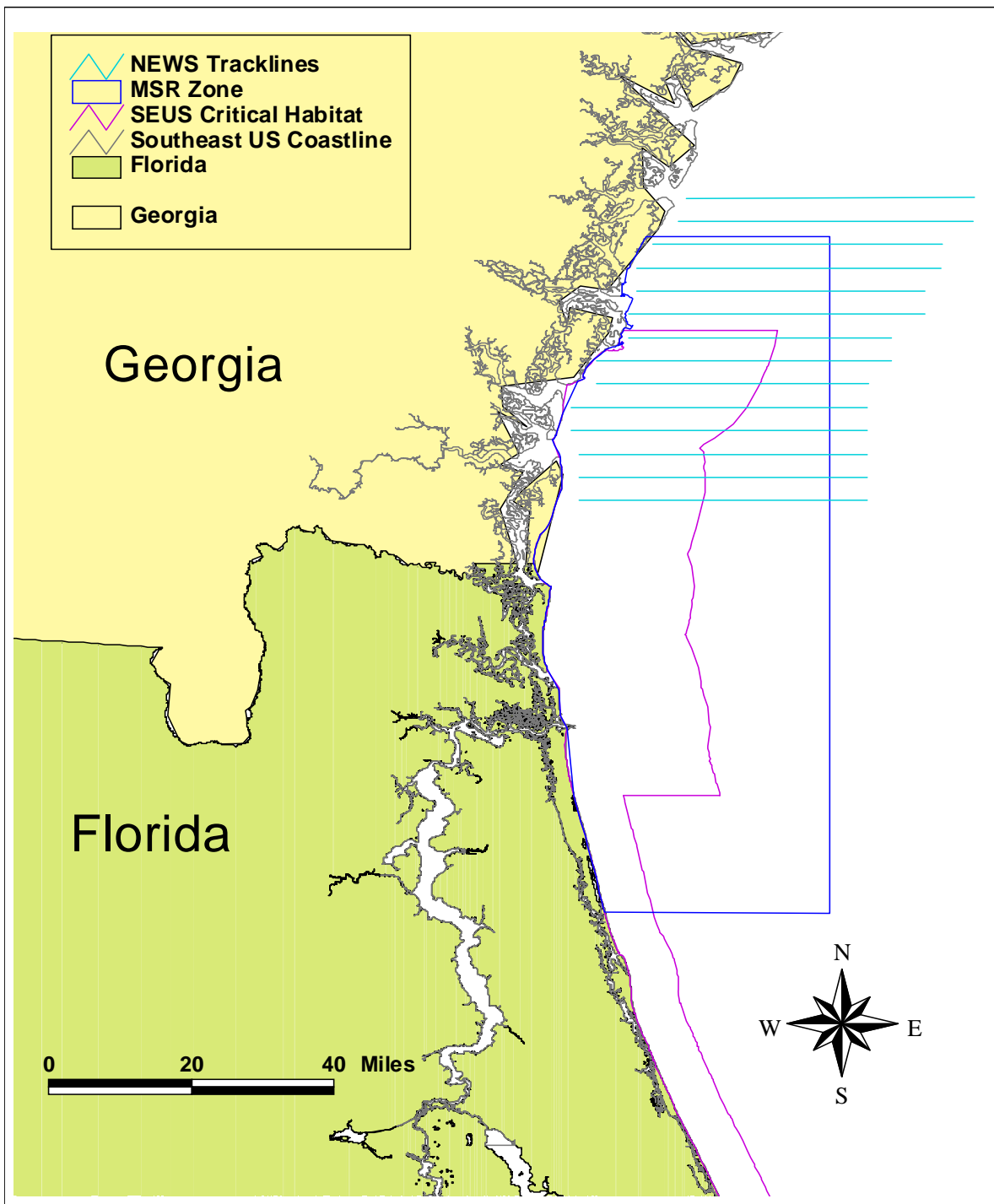


Figure 1: Map of NEWS survey tracklines flown from 01 December 2003 through 31 March 2004, including designated critical habitat and Mandatory Ship Reporting (MSR) zone.

Table 1: Northern early warning system survey transects for the 2003-2004 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**

Surveys were flown at an altitude of 1000 ft (303 m) and at a ground speed of 100 knots. The surveys were typically flown north to south with the western waypoint of the most northern trackline, transect 14, acting as the start point. However, the start point and direction of flight was determined daily based on weather conditions throughout the survey area and other survey factors. Conditions necessary for survey flight included a minimum ceiling of 455m, visibility greater than 2nm, wind speed less than 21 knots, and Beaufort sea state of 5 or less. The survey crew consisted of a pilot and co-pilot, two observers, data recorder, and rest position/photographer. Positions were rotated approximately every four tracklines throughout the duration of the survey with the exception of the data recorder. The observers were positioned on either side of the aircraft at the forward bubble windows and all sightings of marine animals were reported to the data recorder. The data recorder used a laptop computer to log all sightings into Logger 2000, a software program designed for marine data entry. Time, location, number, and species of all marine mammals, sea turtles, and some fish were recorded. In addition, all types of vessels observed in the survey area were recorded. Sighting angles were recorded using a digital inclinometer for all large vessels. Sighting distance for all large whales was calculated from exact overhead GPS locations. 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 photographs and sketches. The circling for photographic documentation was generally limited to 15 minutes for each sighting, with a maximum of 30 minutes during special circumstances. After right whales were documented the aircraft returned to the trackline at the point of departure to continue the survey.

*Determination of Sighting Distance from the Trackline*

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<sub>1</sub>,long<sub>1</sub>), and the lat/long exact overhead position of the right whale (lat<sub>2</sub>,long<sub>2</sub>). The whale's distance in nautical miles from the trackline was determined by subtracting the distance between the two latitude positions, as 1 minute of latitude=1nm in the study area (Figure 2).

The sighting distance from the trackline of large vessels was determined using angles obtained from a digital inclinometer at the time of the vessel's sighting. The angle was obtained when the vessel was

directly perpendicular to the point on the trackline where the location was marked. Using the altitude of the aircraft, and the known angle, A, of the object, the distance, x, of the object from the trackline could be determined from the following equation (Figure 2):

$$x=y(\tan A), \text{ where } y=\text{aircraft altitude in meters}$$

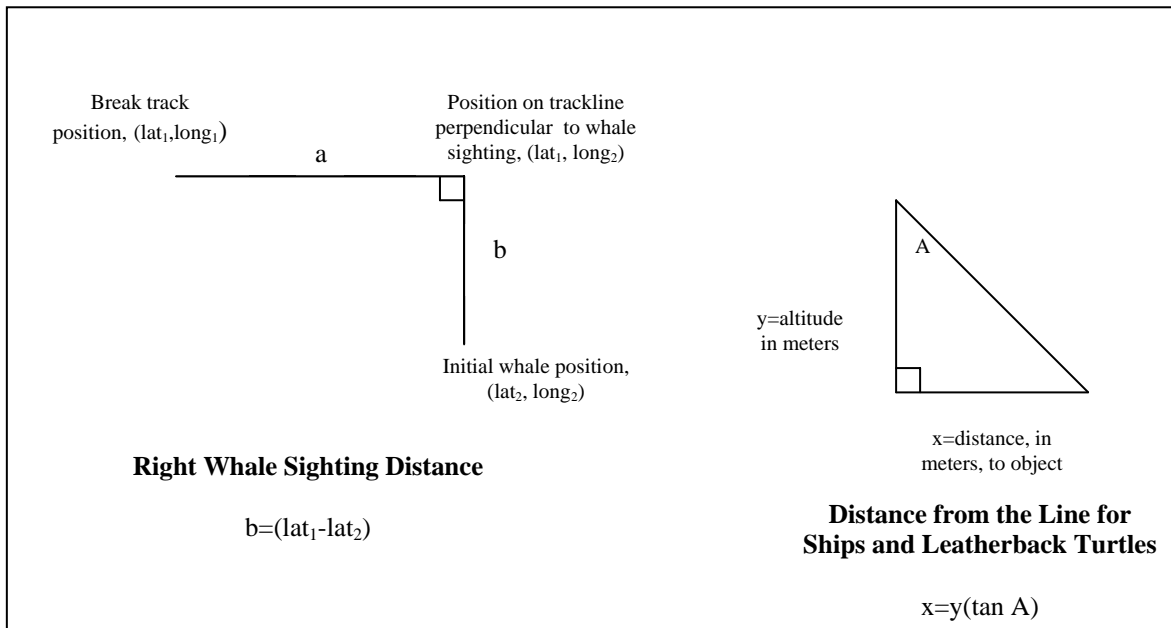


Figure 2: Diagram of methods for determining sighting distance of right whales and distance from the trackline for large vessels during the 2003/2004 NEWS aerial surveys.

#### *Notification of Right Whale Sighting Information*

Upon completing data collection for each right whale sighting, the aircraft would immediately attempt to contact FACSFACJAX (Fleet Area Control and Surveillance Facility) at Naval Air Station Jacksonville. This was usually accomplished via satellite phone. If this method was unsuccessful, the information was either relayed via another survey aircraft or telephoned in immediately after the survey aircraft was on the ground. Information, including date, time, latitude and longitude, direction of movement if applicable, and number of animals and age class, was reported to the dispatcher. FACSFACJAX has the capability to contact all military ships and aircraft almost instantaneously with right whale location information. In addition, the facility notifies all other military and non-military interests via an alphanumeric pager system (Taylor and Brooks 2002). This includes all aerial survey teams, ship channel pilots, USCG NAVTEX, and state agencies. They receive notification of all incoming right whale sightings in near real-time via an alphanumeric pager. This supports real time notification of right whale presence to ships in hopes of eliminating right whale deaths due to ship strike. It also allows aerial survey teams to verify sightings reported from other sources such as military ships and aircraft.

#### *Photographic Identification*

Right whales are 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. The right whales observed during the NEWS aerial surveys were photographed and sketched in order to identify individual animals.

During a right whale sighting, the left observer sketched the right whales being photographed, including callosity patterns and body scarring, and recorded observed behaviors. The rest/photographer position (or the right observer in the absence of a rest/photographer survey crewmember) shifted back to the left rear seat, equipped with a removable window. The aircraft would then circle at an altitude of 1000 ft (303m) while animals were photographed through the open window. Photographs were taken of callosity patterns and any body scarring using a Canon D60 digital camera with a 100-400 mm lens, or a Canon 10D digital camera with a fixed 300 mm lens. In addition, a photographic technique developed by Peter Duley and Tim Cole of the NOAA Northeast Fisheries Science Center was utilized during the first month of the NEWS survey season. The technique consisted of a belly mounted Canon 1D digital camera connected to a laptop. The system was used to photograph right whales while flying directly over the animals, instead of banking at tight angles in order to photograph out of the side window. The connection to the laptop also allowed for real time viewing of images. Whenever the belly mounted camera system was utilized, additional identification photographs were obtained from the side window. These backup images were acquired since the belly mounted camera system was only in its' initial testing for use in the southeast US aerial surveys.

All the photographs obtained during the season were compared against each other and against the New England Aquarium's catalog of North Atlantic right whales in order to determine the probable number of individual right whales encountered during the 2003/2004 NEWS survey season. This preliminary photoanalysis by the Wildlife Trust team and initial verification by New England Aquarium has been completed and all photographs taken during the 2003/2004 season have been sent to the researchers at the New England Aquarium for final confirmation.

## **Results**

### *Surveys*

A total of 61 NEWS surveys were flown during the 121 available survey days of the 2003-2004 right whale calving season (Table 2). A total of 279.4 hours of hobbs time was logged for the NEWS surveys, averaging 4.6 hours of hobbs time per survey. Overall, 21,499.9 nautical miles of trackline were flown, with 10,369.8 nm (48%) of this total flown in a sea state of 3 or less. The complete survey area was covered during 31 of the NEWS surveys. On 30 of the NEWS flights, the survey area was partially covered due to factors such as weather, sea state and aircraft related reasons such as limited flight hours available before required maintenance on the survey aircraft. Days with no survey effort in the NEWS survey area were mostly due to unacceptable weather conditions. Other factors contributing to no fly days were aircraft related reasons such as required rest for survey pilots after 6 days of flying, and grounded aircraft due to required 100-hour safety inspections and other maintenance (Table 3).

Beyond the NEWS surveys conducted during the 2003 – 2004 season, the Wildlife Trust survey team was also involved in 9 flights which were conducted under special circumstances dealing with dead, stranded and entangled right whales (Table 4). The flights were performed using the NOAA Twin Otter and were undertaken at the request of the NOAA SE Right Whale Recovery Program Coordinator. On 3 February, 2004, the NOAA Twin Otter ferried veterinarians and supplies from Sea World in Orlando to the site of a stranded right whale calf on Amelia Island, FL. The Wildlife Trust team assisted in the logistics of the stranding both on the ground and in the air. On 8-9 February, 2004, the survey team assisted in locating a dead right whale female (EGNO 1004) and her fetus which had been spotted off the Virginia coastline. On 17 March, 2004, the Wildlife Trust team surveyed the St. Johns channel area for the New England Aquarium survey team which was assisting in the disentanglement attempt for the whale, Kingfisher. The Wildlife Trust survey team also assisted in the disentanglement attempt of Kingfisher (EGNO 3346) by locating, tracking by telemetry and observing the entangled whale on 17-19, 24, and 26 March, 2004 in various locations from Florida to North Carolina. These 9 special circumstance flights involved a total of 44 hours of aircraft operation time.

Table 2: Survey effort for the NEWS surveys conducted from 01 December 2003 to 31 March 2004.

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
07-Dec-03	NEWS07DEC03		1	5.1	421.8	78.5	0
08-Dec-04	NEWS08DEC03	1		5.3	442.8	442.8	0
09-Dec-04	NEWS09DEC03	1		5.9	442.8	25.4	1
12-Dec-03	NEWS12DEC03	1		5.3	442.8	442.8	0
15-Dec-03	NEWS15DEC03	1		5.2	442.8	256.8	0
16-Dec-03	NEWS16DEC03	1		5.3	442.8	108.1	0
21-Dec-03	NEWS21DEC03	1		5.3	442.8	14.8	0
22-Dec-03	NEWS22DEC03	1		5.6	442.8	58.3	2
23-Dec-03	NEWS23DEC03	1		5.8	442.8	397.2	2
24-Dec-03	NEWS24DEC03	1		5.7	442.8	198.3	1
26-Dec-03	NEWS26DEC03	1		5.0	442.8	442.8	0
28-Dec-03	NEWS28DEC03	1		5.2	442.8	442.8	0
29-Dec-03	NEWS29DEC03	1		5.6	442.8	340.3	4
30-Dec-03	NEWS30DEC03		1	2.4	126.9	106.0	1
31-Dec-03	NEWS31DEC03		1	5.2	396.3	2.5	2
02-Jan-04	NEWS02JAN04	1		6.3	442.8	442.8	6
03-Jan-04	NEWS03JAN04	1		5.6	442.8	442.8	4
04-Jan-04	NEWS04JAN04		1	3.1	250.2	197.2	0
05-Jan-04	NEWS05JAN04		1	4.1	310.7	4.3	2
08-Jan-04	NEWS08JAN04		1	4.8	396.5	0.0	1
12-Jan-04	NEWS12JAN04		1	4.2	310.9	27.0	0
13-Jan-04	NEWS13JAN04		1	4.1	271.4	5.9	0
14-Jan-04	NEWS14JAN04	1		5.8	442.8	338.6	2
17-Jan-04	NEWS17JAN04		1	5.4	435.8	110.5	2
19-Jan-04	NEWS19JAN04		1	3.6	206.1	136.4	3
20-Jan-04	NEWS20JAN04		1	2.6	164.4	0.0	0
21-Jan-04	NEWS21JAN04		1	2.5	187.2	68.5	2
22-Jan-04	NEWS22JAN04		1	2.2	174.2	106.5	0
25-Jan-04	NEWS25JAN04	1		5.6	442.8	417.0	2
29-Jan-04	NEWS29JAN04	1		5.6	442.8	256.3	4
30-Jan-04	NEWS30JAN04	1		5.8	442.8	138.2	3
31-Jan-04	NEWS31JAN04		1	1.8	56.5	0.0	0
04-Feb-04	NEWS04FEB04	1		5.4	442.8	3.2	2
05-Feb-04	NEWS05FEB04	1		5.1	442.8	64.2	0
10-Feb-04	NEWS10FEB04	1		5.8	442.8	442.8	2
15-Feb-04	NEWS15FEB04		1	3.8	221.4	13.7	1
16-Feb-04	NEWS16FEB04		1	1.9	105.5	0.0	0
18-Feb-04	NEWS18FEB04		1	4.8	338.2	27.5	1

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
19-Feb-04	NEWS19FEB04	1		6.1	442.8	196.8	1
20-Feb-04	NEWS20FEB04	1		5.9	442.8	356.6	1
22-Feb-04	NEWS22FEB04	1		6.2	442.8	364.0	6
23-Feb-04	NEWS23FEB04	1		5.8	442.8	0.0	5
28-Feb-04	NEWS28FEB04		1	1.4	54.3	0.0	1
29-Feb-04	NEWS29FEB04	1		5.2	442.8	0.0	0
01-Mar-04	NEWS01MAR04		1	2.8	250.2	250.2	1
11-Mar-04	NEWS11MAR04		1	3.3	250.2	127.2	2
12-Mar-04	NEWS12MAR04	1		5.6	442.8	90.4	2
13-Mar-04	NEWS13MAR04		1	4.7	375.7	0.0	0
14-Mar-04	NEWS14MAR04	1		5.8	442.8	128.7	1
15-Mar-04	NEWS15MAR04	1		5.4	442.8	442.8	0
17-Mar-04	NEWS17MAR04		1	4.3	315.9	20.9	4
18-Mar-04	NEWS18MAR04		1	4.1	347.4	183.1	2
19-Mar-04	NEWS19MAR04		1	3.7	315.9	279.7	0
20-Mar-04	NEWS20MAR04	1		5.8	442.8	319.7	2
21-Mar-04	NEWS21MAR04		1	4.7	393.9	43.6	0
24-Mar-04	NEWS24MAR04		1	2.7	94.9	0.0	0
25-Mar-04	NEWS25MAR04	1		5.3	442.8	43.2	0
27-Mar-04	NEWS27MAR04		1	3.1	250.2	250.2	2
28-Mar-04	NEWS28MAR04		1	3.1	250.2	250.2	0
30-Mar-04	NEWS30MAR04		1	3.5	250.2	250.2	3
31-Mar-04	NEWS31MAR04		1	3.1	250.2	171.6	0
<b>Total</b>	<b>61 Surveys</b>	<b>31</b>	<b>30</b>	<b>279.4</b>	<b>21499.9</b>	<b>10369.8</b>	<b>83</b>

Table 3: Aircraft related reasons for partial or no survey by Wildlife Trust in the NEWS survey area on certain days during the 2003/2004 calving season.

Date	Fly-able Day	Survey Attempted by WT	Aircraft Related Reasons for Partial or No Survey by Wildlife Trust
27-Dec-03	N/A	No	Switching Survey Planes due to 100 hr. Required Maintenance on NOAA57
01-Jan-04	N/A	No	Required Pilot Downtime due to 6 Day Rule
21-Jan-04	Yes	Partial	Limited Available Flight Hours before 100 hr. Required Maintenance on NOAA48
22-Jan-04	Yes	Partial	Limited Available Flight Hours before 100 hr. Required Maintenance on NOAA48
23-Jan-04	N/A	No	Switching Survey Planes - Required Maint. on NOAA48 & NOAA57 Maint. Finished
24-Jan-04	Yes	No	Mechanical Problems with NOAA57
21-Feb-04	Yes	No	Required Pilot Downtime due to 6 Day Rule
01-Mar-04	Yes	Partial	Limited Available Flight Hours before 100 hr. Required Maintenance on NOAA57



Date	Fly-able Day	Survey Attempted by WT	Reasons for Partial or No Survey by Wildlife Trust
02-Mar-04	Yes	No	100 hr. Scheduled Maintenance on NOAA57
03-Mar-04	Yes	No	100 hr. Scheduled Maintenance on NOAA57
04-Mar-04	Yes	No	100 hr. Scheduled Maintenance on NOAA57
05-Mar-04	Yes	No	100 hr. Scheduled Maintenance on NOAA57
06-Mar-04	Yes	No	100 hr. Scheduled Maintenance on NOAA57
07-Mar-04	Yes	No	100 hr. Scheduled Maintenance on NOAA57
08-Mar-04	N	No	100 hr. Scheduled Maintenance on NOAA57
09-Mar-04	Yes	No	100 hr. Scheduled Maintenance on NOAA57
10-Mar-04	N	No	100 hr. Scheduled Maintenance on NOAA57
11-Mar-04	Yes	Partial	NOAA57 Returned from Maintenance at Noon so Only Partial Survey Possible
27-Mar-04	Yes	Partial	Limited Available Flight Hours before 100 hr. Required Maintenance on NOAA57
28-Mar-04	Yes	Partial	Limited Available Flight Hours before 100 hr. Required Maintenance on NOAA57
30-Mar-04	Yes	Partial	Limited Available Flight Hours before 100 hr. Required Maintenance on NOAA57
31-Mar-04	Yes	Partial	Limited Available Flight Hours before 100 hr. Required Maintenance on NOAA57

Table 4: Wildlife Trust special circumstance flights during the 2003/2004 aerial survey season.

Date	Flight Name	Flight Hobbs Time	Description of Flight	Number of Whales Seen
03-Feb-04	STRD03FEB04	3.4	Ferry Vets and Supplies to Stranded Calf on Amelia Island	1 (Dead)
08-Feb-04	VAEG08FEB04	3.5	Transit to Virginia Beach	N/A
09-Feb-04	VAEG09FEB04	6.8	Located Dead Female and Fetus off Virginia	2 (Dead)
17-Mar-04	EWS17MAR04	1.1	Surveying St. Johns Channel in EWS survey area	2
17-Mar-04	ENTG17MAR04	3.4	Located Entangled Whale (Kingfisher) off Florida	1
18-Mar-04	ENTG18MAR04	3.2	Located Entangled Whale (Kingfisher) off Florida	1
19-Mar-04	ENTG19MAR04	5.7	Located Entangled Whale (Kingfisher) off GA	1
24-Mar-04	ENTG24MAR04	5.5	Located Entangled Whale (Kingfisher) off SC	1
26-Mar-04	ENTG26MAR04	11.4	Located Entangled Whale (Kingfisher) off NC	3
<b>Total</b>		<b>44</b>		<b>12 (3 Dead)</b>

On four days in which the Wildlife Trust survey team was unavailable to fly the NEWS survey area due to aircraft related reasons or special circumstance flights, the portion of the NEWS survey covering the Brunswick channel was flown by the NEA or FMRI aerial survey teams. The NEA survey team flew the Brunswick channel on 9 February, 2004. The FMRI team surveyed the Brunswick channel area on 9, 19 and 26 March, 2004. The only right whale sighting during these flights occurred on 9 March when the FMRI team sighted a mother and calf pair (EGNO 1321 and calf) at 11:58am (L) at 30° 52 N, 81°07 W.

#### *Right Whale Sightings and Identifications*

Forty-six right whale sightings were documented by Wildlife Trust on the NEWS surveys and 7 live sightings were documented on the 9 special circumstance flights for a total of 53 sightings consisting of 92 animals (Table 5) (these totals do not include the stranded calf or dead mother and fetus). Twenty

cow/calf pairs, 20 single animals, and 13 groups of 2 or more adult/juvenile right whales were documented. Only one sighting involving a single whale resulted in no photographic documentation due to elusive behavior of the animal. Preliminary photoanalysis by the Wildlife Trust team and verification by New England Aquarium has resulted in the identification of 13 individual cow/calf pairs and 19 individual adult/juvenile whales which account for 77 of the 92 animals sighted during the season (Table 5). Thirteen individual whales have yet to be identified, including one individual whale sighted on two occasions in the NEWS survey area during the season. All right whale identification information included in this report should not be considered confirmed until the New England Aquarium completes the confirmation process in the coming months. Locations of the 46 NEWS right whale sightings are depicted in Figure 3. Figure 4 includes the 46 NEWS right whale sightings, but also depicts the 7 live right whale sightings by Wildlife Trust during the special circumstance flights.

Table 5: NEWS and special circumstance right whale sightings from 01 December 2003 through 31 March 2004.

Sighting Number	Month	Day	Year	Time	Survey Number	DecLat	DecLong	RIWH Letter	EGNO	Time Report	NRW Number	Comments	Sighting Distance (nm)
1	12	09	2003	10:01	NEWS09DEC03	31.483	-81.073	A	1701	10:50	NRW04003		0.18
2	12	22	2003	10:53	NEWS22DEC03	31.438	-81.060	A	2660	11:22	NRW04022		0.42
3	12	22	2003	10:53	NEWS22DEC03	31.438	-81.060	B		11:22	NRW04022		0.42
4	12	23	2003	13:02	NEWS23DEC03	31.027	-81.143	A	1705	13:31	NRW04024	w/ calf	1.14
5	12	23	2003	13:02	NEWS23DEC03	31.027	-81.143	B	n/a	13:31	NRW04024	Calf	1.14
6	12	24	2003	14:38	NEWS24DEC03	30.99	-81.115	A	2427	15:05	NRW04029		0.42
7	12	29	2003	10:53	NEWS29DEC03	31.389	-81.079	A	2145	11:06	NRW04032	w/ calf	0.66
8	12	29	2003	10:53	NEWS29DEC03	31.389	-81.079	B	n/a	11:06	NRW04032	Calf	0.66
9	12	29	2003	13:36	NEWS29DEC03	30.988	-81.273	C	2660	15:00	NRW04033		0.06
10	12	29	2003	13:36	NEWS29DEC03	30.988	-81.273	D	2360	15:00	NRW04033		0.06
11	12	30	2003	16:22	NEWS30DEC03	31.031	-81.218	A	1509	16:46	NRW04038		0.12
12	12	31	2003	12:55	NEWS31DEC03	30.928	-81.292	A	2330	13:17	NRW04039		0.42
13	12	31	2003	12:55	NEWS31DEC03	30.928	-81.292	B	2503	13:17	NRW04039		0.42
14	01	02	2004	12:28	NEWS02JAN04	30.992	-81.263	A	1151	13:00	NRW04046	w/ yearling	0.06
15	01	02	2004	12:28	NEWS02JAN04	30.992	-81.263	B	1151's yearling	13:00	NRW04046	yearling	0.06
16	01	02	2004	14:29	NEWS02JAN04	31.285	-81.140	C	1243	14:39	NRW04047	w/ yearling	0.12
17	01	02	2004	14:29	NEWS02JAN04	31.285	-81.140	D	1243's yearling	14:39	NRW04047	yearling	0.12
18	01	02	2004	15:00	NEWS02JAN04	31.341	-80.862	E	1266	15:30	NRW04049	w/ calf	0.24
19	01	02	2004	15:00	NEWS02JAN04	31.341	-80.862	F	n/a	15:30	NRW04049	Calf	0.24
20	01	03	2004	11:13	NEWS03JAN04	31.487	-80.832	A	1812	11:42	NRW04055	w/ calf	0.12
21	01	03	2004	11:13	NEWS03JAN04	31.487	-80.832	B	n/a	11:42	NRW04055	Calf	0.12
22	01	03	2004	12:47	NEWS03JAN04	31.292	-80.880	C	1266	13:00	NRW04057	w/ calf	0.48
23	01	03	2004	12:47	NEWS03JAN04	31.292	-80.880	D	n/a	13:00	NRW04057	Calf	0.48
24	01	05	2004	12:17	NEWS05JAN04	31.483	-80.980	A	1701	14:22	NRW04064	w/ calf	0.06
25	01	05	2004	12:17	NEWS05JAN04	31.483	-80.980	B	n/a	14:22	NRW04064	Calf	0.06
26	01	08	2004	11:52	NEWS08JAN04	31.537	-81.048	A	no photos	15:49	NRW04068		0.12
27	01	14	2004	14:08	NEWS14JAN04	30.906	-81.345	A	1812	14:31	NRW04084	w/ calf	1.32
28	01	14	2004	14:08	NEWS14JAN04	30.906	-81.345	B	n/a	14:31	NRW04084	Calf	1.32
29	01	17	2004	13:07	NEWS17JAN04	30.947	-81.246	A		14:00	NRW04097		0.30

Sighting Number	Month	Day	Year	Time	Survey Number	Declat	Declong	RIVH Letter	EGNO	Time Report	NRW Number	Comments	Sighting Distance (nm)
30	01	17	2004	13:07	NEWS17JAN04	30.947	-81.246	B		14:00	NRW04097		0.30
31	01	19	2004	11:45	NEWS19JAN04	31.384	-80.953	A	3110 poss.	12:15	NRW04100		0.01
32	01	19	2004	11:45	NEWS19JAN04	31.384	-80.953	B		12:15	NRW04100		0.01
33	01	19	2004	11:45	NEWS19JAN04	31.384	-80.953	C		12:15	NRW04100		0.01
34	01	21	2004	11:08	NEWS21JAN04	30.979	-81.233	A		11:26	NRW04106		0.00
35	01	21	2004	11:08	NEWS21JAN04	30.979	-81.233	B	3139	11:26	NRW04106		0.00
36	01	25	2004	13:16	NEWS25JAN04	30.982	-81.197	A	2145	13:34	NRW04130	w/ calf	0.11
37	01	25	2004	13:16	NEWS25JAN04	30.982	-81.197	B	n/a	13:34	NRW04130	Calf	0.11
38	01	29	2004	13:41	NEWS29JAN04	30.992	-81.296	A	1812	14:10	NRW04138	w/ calf	0.53
39	01	29	2004	13:41	NEWS29JAN04	30.992	-81.296	B	n/a	14:10	NRW04138	Calf	0.53
40	01	29	2004	13:56	NEWS29JAN04	30.924	-81.236	C	1701	14:10	NRW04139	w/ calf	0.40
41	01	29	2004	13:56	NEWS29JAN04	30.924	-81.236	D	n/a	14:10	NRW04139	Calf	0.40
42	01	30	2004	10:48	NEWS30JAN04	31.399	-81.007	A	2660	10:55	NRW04146		0.67
43	01	30	2004	10:48	NEWS30JAN04	31.399	-81.007	B	1611	10:55	NRW04146		0.67
44	01	30	2004	14:30	NEWS30JAN04	31.052	-81.233	C	2614	15:08	NRW04148		N/A
45	02	04	2004	12:29	NEWS04FEB04	31.078	-81.255	A	2145	12:54	NRW04161	w/calf	0.27
46	02	04	2004	12:29	NEWS04FEB04	31.078	-81.255	B	n/a	12:54	NRW04161	Calf	0.27
47	02	10	2004	11:41	NEWS10FEB04	31.491	-80.984	A	2614	11:57	NRW04174		0.41
48	02	10	2004	12:44	NEWS10FEB04	31.332	-81.055	B	1151's yearling	12:55	NRW04175	yearling	0.00
49	02	15	2004	13:40	NEWS15FEB04	31.207	-81.077	A	1281	13:59	NRW04181		1.30
50	02	18	2004	12:56	NEWS18FEB04	31.084	-80.938	A	2614	13:23	NRW04185		0.04
51	02	19	2004	12:57	NEWS19FEB04	31.093	-81.001	A	1281	13:21	NRW04192		0.58
52	02	20	2004	10:57	NEWS20FEB04	31.330	-80.991	A	2614	11:30	NRW04200		0.21
53	02	22	2004	9:40	NEWS22FEB04	31.536	-80.706	A	1620	10:06	NRW04207	w/ calf	0.14
54	02	22	2004	9:40	NEWS22FEB04	31.536	-80.706	B	n/a	10:06	NRW04207	Calf	0.14
55	02	22	2004	12:25	NEWS22FEB04	31.184	-81.152	C		13:08	NRW04211		0.18
56	02	22	2004	12:25	NEWS22FEB04	31.184	-81.152	D	2303	13:08	NRW04211		0.18
57	02	22	2004	12:25	NEWS22FEB04	31.184	-81.152	E		13:08	NRW04211		0.18
58	02	22	2004	12:25	NEWS22FEB04	31.184	-81.152	F	1980	13:08	NRW04211		0.18
59	02	23	2004	15:25	NEWS23FEB04	30.987	-81.082	A	1019	16:00	NRW04217		0.06
60	02	23	2004	15:25	NEWS23FEB04	30.987	-81.082	B	1428	16:00	NRW04217		0.06
61	02	23	2004	15:25	NEWS23FEB04	30.987	-81.082	C		16:00	NRW04217		0.06
62	02	23	2004	15:25	NEWS23FEB04	30.987	-81.082	D	1152	16:00	NRW04217		0.06
63	02	23	2004	15:25	NEWS23FEB04	30.987	-81.082	E		16:00	NRW04217		0.06
64	02	28	2004	11:55	NEWS28FEB04	31.067	-80.935	A	1170	12:00	NRW04222		0.77
65	03	01	2004	10:19	NEWS01MAR04	31.079	-81.144	A	1708	10:31	NRW04225		0.25
66	03	11	2004	14:41	NEWS11MAR04	31.076	-80.869	A	1142	15:05	NRW04274	w/ calf	0.38
67	03	11	2004	14:41	NEWS11MAR04	31.076	-80.869	B	n/a	15:05	NRW04274	Calf	0.38
68	03	12	2004	11:14	NEWS12MAR04	31.294	-81.051	A	1142	11:38	NRW04276	w/calf	0.59
69	03	12	2004	11:14	NEWS12MAR04	31.294	-81.051	B	n/a	11:38	NRW04276	Calf	0.59
70	03	14	2004	11:33	NEWS14MAR04	31.024	-81.057	A	2608	11:50	NRW04279		0.00

Sighting Number	Month	Day	Year	Time	Survey Number	Declat	Declong	RIWH Letter	EGNO	Time Report	NRW Number	Comments	Sighting Distance (nm)
71	03	17	2004	11:12	NEWS17MAR04	31.029	-80.952	A	1151's yearling	11:31	NRW04286		0.37
72	03	17	2004	11:12	NEWS17MAR04	31.029	-80.952	B		11:31	NRW04286		0.37
73	03	17	2004	12:07	NEWS17MAR04	31.191	-81.029	C	2330	12:31	NRW04288	w/calf	0.49
74	03	17	2004	12:07	NEWS17MAR04	31.191	-81.029	D	n/a	12:31	NRW04288	Calf	0.49
75	03	17	2004	16:54	EWS17MAR04	30.322	-81.098	E	1911	17:06	NRW04290	w/calf	0.54
76	03	17	2004	16:54	EWS17MAR04	30.322	-81.098	F	n/a	17:06	NRW04290	Calf	0.54
77	03	17	2004	14:30	ENTG17MAR04	29.733	-81.206	A	3346	11:56	NRW04287	entangled	N/A
78	03	18	2004	11:06	NEWS18MAR04	31.076	-81.154	A	1281	11:25	NRW04296	w/calf	0.01
79	03	18	2004	11:06	NEWS18MAR04	31.076	-81.154	B	n/a	11:25	NRW04296	Calf	0.01
80	03	18	2004	12:48	ENTG18MAR04	29.746	-80.517	A	3346	13:34	NRW04297	entangled	N/A
81	03	19	2004	10:32	ENTG19MAR04	30.745	-79.926	A	3346	11:03	NRW04301	entangled	N/A
82	03	20	2004	12:39	NEWS20MAR04	31.095	-81.273	A	2614	13:02	NRW04303	w/calf	0.14
83	03	20	2004	12:39	NEWS20MAR04	31.095	-81.273	B	n/a	13:02	NRW04303	Calf	0.14
84	03	24	2004	11:28	ENTG24MAR04	33.692	78.246	A	3346	n/a	n/a	entangled	N/A
85	03	26	2004	8:10	ENTG26MAR04	34.351	-76.347	A		8:29	NRW04307		N/A
86	03	26	2004	8:10	ENTG26MAR04	34.351	-76.347	B		8:29	NRW04307		N/A
87	03	26	2004	11:00	ENTG26MAR04	34.586	-76.636	C	3346	16:35	NRW04308	entangled	N/A
88	03	27	2004	10:28	NEWS27MAR04	31.025	-81.335	A	2614	10:35	NRW04309	w/calf	0.56
89	03	27	2004	11:28	NEWS27MAR04	31.025	-81.335	B	n/a	10:35	NRW04309	Calf	0.56
90	03	30	2004	9:04	NEWS30MAR04	31.242	-81.102	A		9:40	NRW04311		0.01
91	03	30	2004	10:45	NEWS30MAR04	31.035	-81.009	B	2614	10:55	NRW04312	w/calf	0.00
92	03	30	2004	10:45	NEWS30MAR04	31.035	-81.009	C	n/a	10:55	NRW04312	Calf	0.00

As of mid March 2004, a total of 54 individual right whales (including 15 mother and calf pairs) had been identified in the Southeast US. This total does not include the stranded calf, dead mother (EGNO 1004) and fetus, or the entangled whale, Kingfisher (EGNO 3346). Included in this report is the most up to date list of identified right whales in the Southeast US as of 18 March, 2004 (Figure 5). This list was supplied by the New England Aquarium, and includes sightings from all three of the right whale aerial survey teams in the Southeast US (Wildlife Trust, New England Aquarium and Florida Marine Research Institute). Since this list was compiled, another mother (EGNO 2460) for the 2003/2004 calving season was identified in Cape Cod Bay. This addition brings the total number of mother and calf pairs to 16 as of the end of May 2004.

It is important to note that at least 10 of the mothers observed during the 2003/2004 season last gave birth 3 or less years ago (Figure 5). Nine of the mothers documented in the southeast were mothers in 2001, and one mother had a calf in 2002. The typical calving interval for North Atlantic right whales had been concluded to range from 3 to 5 years, but the calving intervals had been increasing in the 1990's (Kraus and Hatch, 2001). It will be interesting to see if this general trend of shorter calving intervals continues in the coming calving seasons, or if it is simply a short term anomaly.

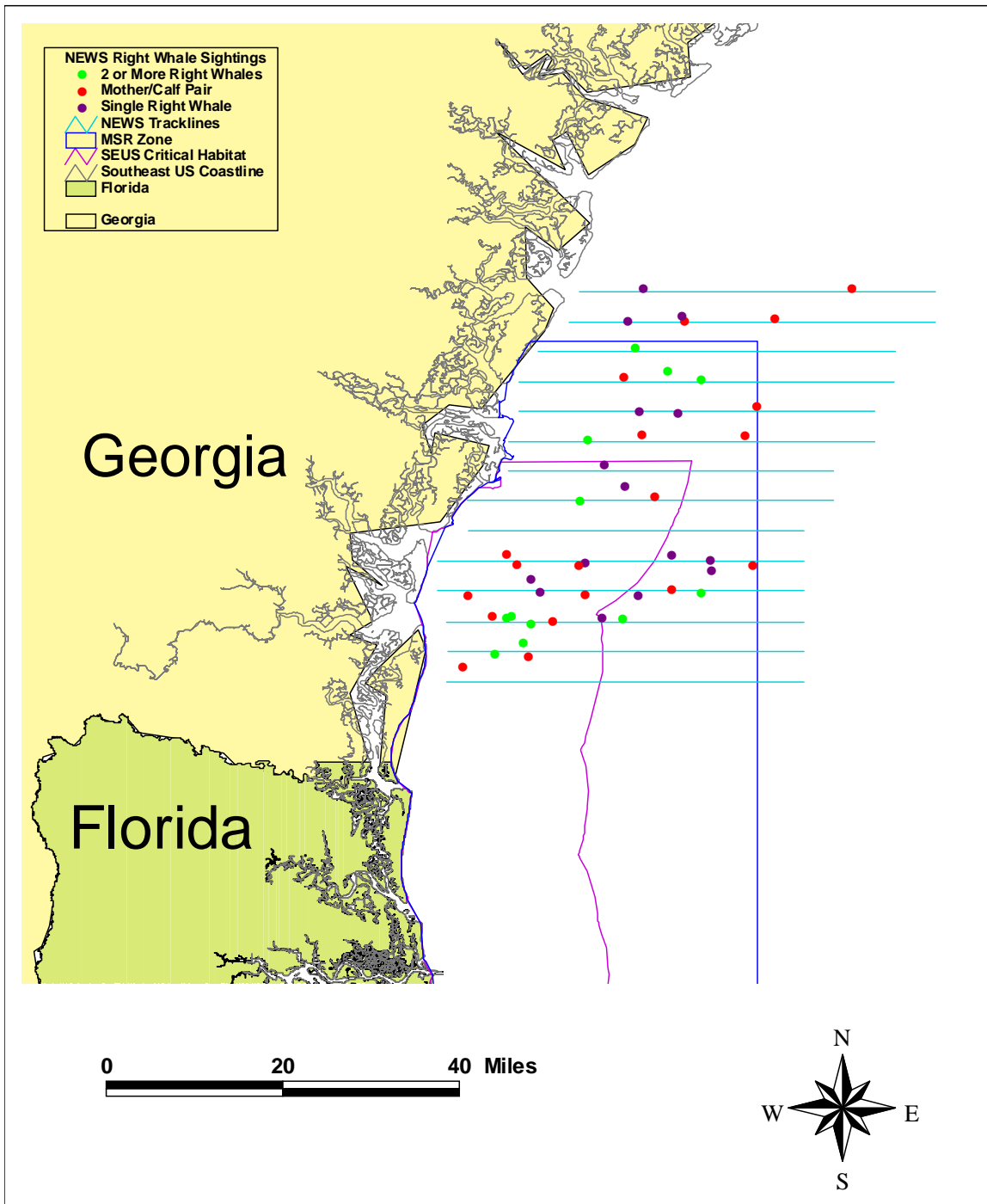


Figure 3: Right Whale sightings documented during the 2003/2004 NEWS right whale aerial surveys.

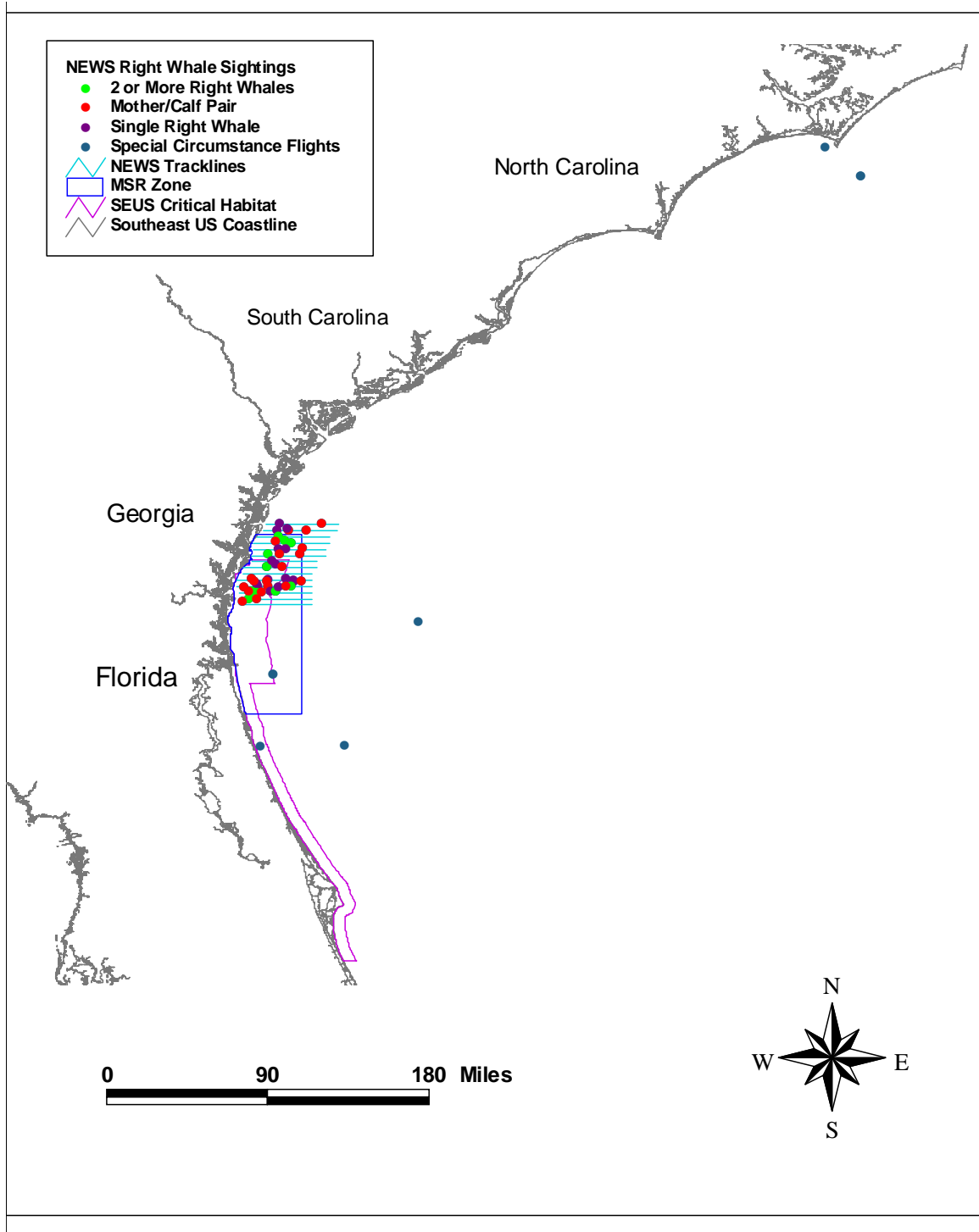


Figure 4: Right whale sightings documented during the 2003/2004 NEWS right whale aerial surveys and Wildlife Trust special circumstance flights.

SEUS Animals 2004					
Mothers	Code	last calving	mother	Darted?	
					calf
1123	B4	2001	y		
1142	B1	2001	y		
1266	B3	2001	y		
1281	B1	2001	y		
1321	C14	1998	Y	Y	
1509	B9	2001	y		Y
1620	B1	2001	no		
1701	B5,B4	2001	y		Y
1705	B10	1996	y		Y
1812	B1	2002	y		Y
1911	C8	2001	y		
2145	B2,B6,B8	2001	y		Y
2360	B7		no		
2330	B6		y		Y
2614	B1,B2,B4		y		
Other Egs	Sex	Age	w/yearling?	Darted?	
1019	m				y
1151	Ff		y		y
1152	Mm				y
1170	Mm	23			y
1243	F(f?)	22	y		y
1301	Ff	21	y		y
1428	m				y
1611	Ff	18			y
1708	m	17			y
1817	Ff		y		y
1980	Mm				y
2010	m	14			y
2303	Mm	11			y
2427	m	10			y
2503	f	9			y
2660	f	8			y
2710	Ff	7			y
3110++	m	3			no
3123	f	3			y
3139	U	3			no

2003 Calves (mothers listed, as calves have not yet received EGNOS)

darted	not darted
1151	1208
1233	1515
1243	1612
1301	1711
1503**	2114
1608*	2301
1802*	2520
1817	
1946*	
1950*	
2029	
2123*	
unk.	

updated 3-18-04 by HMP

\*BOF unconf. Sightings  
\*\*Fall 2003 Jeffrey's Ledge unconf. Sighting

Y- darted this season      F/M-sexed visually  
y-darted previously        f/m-sexed genetically  
no- not yet darted        ++ very tentative match

List Changes

**1/26/2004**

1. 1509 becomes a mother

2. Removed 1946 and yearling from list - 1946 was

mis-identified and as a result, so was the young whale with her. Whale previously identified as 1946 has been matched to whale not yet numbered.

Young whale (subsequently seen in St. John's river) not yet matched.

3. Removed 2210 from list - mis-identified

4. UNID mother added to list - seen by FL on 1/25/04  
: 2360 (whale seen off Miami on 1/30/04) added to mother list.

**2/3/2004**

She and her calf are a priority for darting

**2/17/2004**

1. 1123 added as a mother, removed from other Eg list
2. 1509's calf has been darted
3. 1281 added to Other Eg list
4. 2614 added to Other Eg list

**2/23/2004**

1. 1620 added as mother - both she and her calf need to be darted
2. Calf of UNID mother darted

**3/1/2004**

1. 2330 confirmed as the previous UNID mother, her calf has been darted
2. 2145's calf darted

**3/9/2004** : 1281 added as a mother, removed from other Eg list

**3/12/2003** 1. 1142 added as a mother

2. The following Egs were added to the Other Eg list:      1019      1152  
1170      1428      1708      1980      2010      2303

**3/15/2003** : 2614 added as a mother, removed from Other Eg list

**3/18/2004** : 1911 added as a mother

Figure 5: Individual right whales identified in southeast US between 1 December 2003 and 18 March 2004.

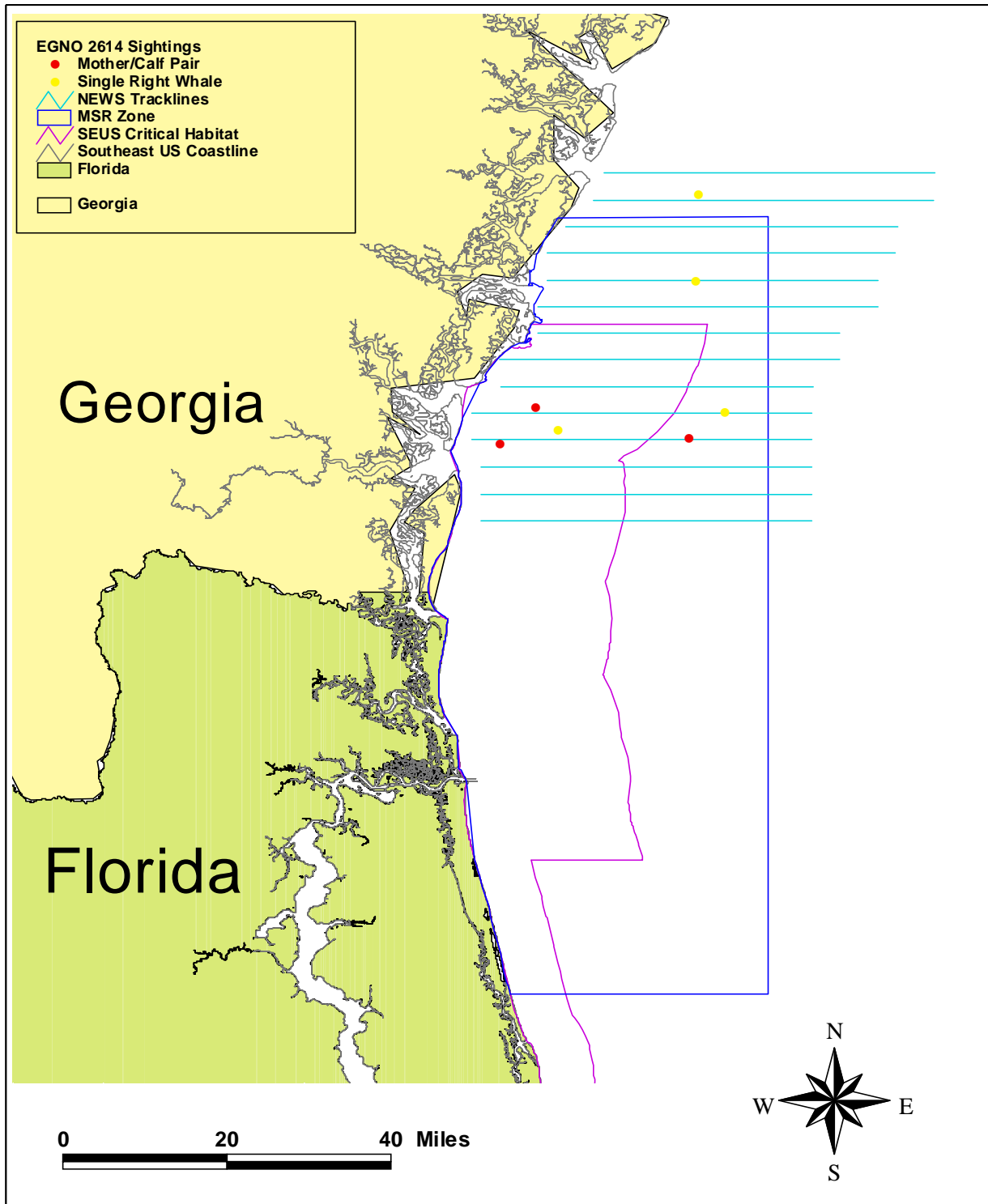


Figure 6: EGNO 2614 NEWS sightings between 30 January, 2004 and 30 March, 2004.



*Temporal and Spatial Movements of Right Whales*

Only one mother/calf pair was seen on more than three occasions during the NEWS surveys. EGNO 2614 was sighted seven times by the NEWS team from 30 January through 30 March 2004 for a residency period in the southeast of at least 2 months. Figure 6 depicts the sightings of EGNO 2614 as a single adult and later on in the season with a calf. EGNO 2614’s first four sightings were without a calf and occurred on 30 January and 10, 18, and 20 February, 2004. EGNO 2614 was not seen again in the NEWS survey area until 20 March, when she was observed with a calf. This mother/calf pair was again sighted on 27 and 30 March, 2004. Four out of seven sightings of this animal occurred outside of the critical habitat, and one of the sightings was outside the Mandatory Ship Reporting (MSR) Zone. The month long period of time between EGNO 2614’s last sighting as a single adult and her first sighting in the NEWS survey area with a calf indicate the female left the NEWS area before giving birth (quite likely heading south) and then was returning through the NEWS survey area on her migration back north with her calf. Fifty-three percent of all right whale sightings documented during the 2003-2004 NEWS surveys were located outside of the currently designated right whale critical habitat.

*Sighting Distances for Right Whales*

Sighting distances were calculated whenever possible, and the average sighting distance for all right whale sightings was 0.32 nm (SD=0.316).

*Sighting Distances for Large Vessels*

Sighting angles were obtained for all large commercial and military ships whenever possible, and used to calculate distance from the trackline. Average distance from the trackline for all large vessels was 2753.62 m (SD=3522.51). See Appendix 1 for all sightings of large ships during the 2003/2004 NEWS surveys.

*Marine Animal Sightings*

All cetaceans, sea turtles, sharks, rays, and certain fish species were recorded while conducting these surveys. Date, time, lat/long position, species and number, aircraft heading and altitude, and environmental conditions such as overall weather trend, Beaufort sea state, glare, and visibility were also entered into the data logger. Table 6 summarizes all marine mammal sightings for all attempted surveys.

Table 6: Summary of other marine animal sightings during the 2003/2004 NEWS right whale surveys.

Survey Date	LETU	LOTU	RITU	UNTU	BODO	ASDO	UNDO	OCSU	UNSH	BASH	UNRA	CNRA	MARA	UNLW	HUWH	SCFI	UNID	UNST	HHSH	MANA
07-Dec-03	0	33	0	1	9	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0
08-Dec-03	0	132	0	27	336	0	13	13	0	0	0	161	0	0	0	2	4	4	0	0
09-Dec-03	0	11	0	0	23	0	5	1	0	0	0	290	0	0	0	0	0	0	0	0
12-Dec-03	0	105	0	9	146	0	49	10	1	0	0	0	0	0	0	3	1	1	0	0
15-Dec-03	0	86	1	6	106	0	8	6	0	0	0	50	0	0	0	1	2	2	0	0
16-Dec-03	0	63	0	0	23	0	0	17	1	0	0	0	0	0	0	0	1	1	0	0
21-Dec-03	0	8	0	2	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-Dec-03	0	33	0	2	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Dec-03	0	148	1	13	161	0	2	15	0	2	0	0	0	0	0	1	0	0	0	0
24-Dec-03	0	50	0	1	113	0	1	5	0	0	0	75	0	0	0	4	1	1	0	0
26-Dec-03	0	10	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Dec-03	0	18	0	0	10	0	3	2	0	0	0	0	0	0	0	0	1	0	0	0
29-Dec-03	0	73	0	1	124	0	10	9	0	1	0	0	0	0	0	0	0	0	0	0
30-Dec-03	0	21	0	0	51	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0

Survey Date	LETU	LOTU	RITU	UNTU	BODO	ASDO	UNDO	OCSU	UNSH	BASH	UNRA	CNRA	MARA	UNLW	HUWH	SCFI	UNID	UNST	HHSH	MANA
31-Dec-03	0	10	0	0	13	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
02-Jan-04	0	133	0	3	90	0	0	9	0	6	0	0	0	0	0	0	0	0	0	0
03-Jan-04	0	235	0	14	227	0	34	22	0	7	0	0	0	0	0	1	1	0	0	0
04-Jan-04	0	69	0	3	217	0	6	11	0	2	0	0	0	0	0	2	0	0	0	0
05-Jan-04	0	18	0	0	134	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
08-Jan-04	0	9	0	0	29	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12-Jan-04	0	10	0	0	49	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
13-Jan-04	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Jan-04	3	47	0	2	199	0	4	4	1	4	1	0	0	0	0	1	0	0	0	0
17-Jan-04	0	16	0	0	14	0	0	3	0	1	0	0	0	0	0	1	0	0	0	0
19-Jan-04	0	12	0	0	35	0	0	1	0	1	0	0	0	0	0	2	0	3	0	0
20-Jan-04	0	4	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Jan-04	0	35	0	2	76	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0
22-Jan-04	0	15	0	1	68	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
25-Jan-04	0	49	0	0	154	0	6	3	0	8	0	0	0	0	0	1	2	10	0	0
29-Jan-04	0	19	0	0	95	0	5	0	0	0	0	0	0	0	0	1	0	0	0	0
30-Jan-04	0	5	0	0	105	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Jan-04	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-Feb-04	0	3	0	0	19	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
05-Feb-04	0	5	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Feb-04	0	16	0	0	91	0	10	11	0	1	0	0	0	0	0	1	0	0	0	0
15-Feb-04	0	10	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Feb-04	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Feb-04	0	2	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Feb-04	0	13	0	0	52	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0
20-Feb-04	0	23	0	0	72	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
22-Feb-04	0	12	0	0	160	0	10	1	1	2	0	0	0	0	0	2	2	0	0	0
23-Feb-04	0	2	0	0	26	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0
28-Feb-04	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
29-Feb-04	1	0	0	0	3	0	1	1	0	0	0	0	0	0	0	1	2	0	0	0
01-Mar-04	0	17	0	1	25	0	0	9	0	0	0	0	0	0	0	2	0	0	0	0
11-Mar-04	1	70	1	4	35	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
12-Mar-04	1	14	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Mar-04	1	18	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Mar-04	0	50	0	2	10	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0
15-Mar-04	2	250	12	6	203	0	4	33	0	0	0	0	0	0	0	0	1	8	0	0
17-Mar-04	1	5	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Mar-04	6	135	3	10	108	0	0	17	0	0	1	0	0	0	0	3	1	0	0	0
19-Mar-04	3	121	4	4	94	0	1	21	0	1	0	0	0	0	0	0	0	0	0	0
20-Mar-04	2	115	2	2	114	0	65	22	1	0	0	167	0	0	0	4	1	0	0	0
21-Mar-04	0	34	0	0	3	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0
24-Mar-04	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Survey Date	LETU	LOTU	RITU	UNTU	BODO	ASDO	UNDO	OCSU	UNSH	BASH	UNRA	CNRA	MARA	UNLW	HUWH	SCFI	UNID	UNST	HSHH	MANA
25-Mar-04	4	28	2	0	17	0	16	6	1	0	0	0	0	0	0	1	1	0	0	1
27-Mar-04	4	84	6	0	51	0	1	9	1	0	0	35	0	0	0	0	0	0	0	0
28-Mar-04	6	125	1	1	82	0	1	4	0	0	8	3369	0	0	0	1	0	0	0	0
30-Mar-04	4	111	1	1	47	0	10	2	0	0	2	270	0	0	0	3	1	20	0	0
31-Mar-04	2	54	0	0	70	0	0	14	0	0	0	31	0	0	0	1	1	0	0	0
<b>Totals</b>	<b>41</b>	<b>2797</b>	<b>34</b>	<b>118</b>	<b>4150</b>	<b>0</b>	<b>272</b>	<b>309</b>	<b>7</b>	<b>41</b>	<b>12</b>	<b>4448</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>26</b>	<b>51</b>	<b>1</b>	<b>1</b>

LETU=leatherback turtle; LOTU=loggerhead turtle; RITU=ridley turtle; UNTU=unidentified turtle; BODO=bottlenose dolphin; ASDO=Atlantic Spotted Dolphin; UNDO=unidentified dolphin; OCSU=ocean sunfish; UNSH = unidentified shark; BASH = basking shark; UNRA=unidentified ray; CNRA=cownose ray; MARA=manta ray; UNLW=unidentified large whale; HUWH=humpback whale, SCFI= fish school, UNID=unidentified animal, UNST=Unidentified Stenella, HSHH=hammerhead shark, MANA=manatee

#### *Whale/Ship Interactions*

Two whale/ship interactions (“close calls”) were observed by the Wildlife Trust survey team during the 2003/2004 survey season. The first incident involved a single adult right whale and the dredge, Stuyvesant, which was operating in the Brunswick channel from 16 January to the end of February, 2004. At 14:26 on 30 January, 2004, the Stuyvesant contacted the NOAA Twin Otter to inform the survey team that a whale had been sighted within close proximity to the dredge. At 14:33, the survey plane contacted the dredge to inform them that the survey team had sighted the right whale at 31° 03.138 N, 81° 13.975 W and it was heading in the direction of the dredge. At this time, the Stuyvesant was heading southeast out of the Brunswick channel at 6-8 knots. The whale was about one and a half miles to the northeast of the dredge, heading southwest. After copying the information from the survey team, the Stuyvesant made a ninety degree turn to the southwest and away from the whale’s last seen location. At 14:37, the whale was observed heading south and the Stuyvesant was about one mile to the southwest of the whale and heading away from the animal. This one mile distance was the closest juncture between the whale and the dredge, and the survey team remained in the area for another ten minutes to make sure there was no further possibility of interaction between the single adult right whale and any boat traffic around the Brunswick channel, including the Stuyvesant. During the entire time the survey team observed the movements of the Stuyvesant and the adult right whale, there did not appear to be any reaction by the right whale to the close proximity of the dredge.

The second whale/ship interaction was observed on 19 March, 2004 during the tracking of the entangled whale, Kingfisher, by the Wildlife Trust survey team. Shortly after successfully using telemetry tracking gear to locate the single right whale at 30° 44.7 N, 79° 55.6W, a large container ship was observed 5 nautical miles to the north of the whale at 10:45am. At this time, the whale was swimming at 6-7 knots to the northeast. The container ship, Prospector 2, was estimated to be traveling at about 30 knots and southwest (205°), in the general direction of the right whale. At 10:57, the survey team contacted the container ship and informed them of the whale’s last location. The survey team also requested that the vessel give “the whale a wide berth.” The vessel copied the location of the whale and stated they would give “the whale a wide berth.” The vessel then changed their heading 20 degrees to the east, but did not change speed. At 11:10, the whale was sighted traveling generally north with the vessel about one and a half miles to the north of the whale at this time. The whale appeared to have changed direction after swimming to the northeast during all previous sightings. The vessel continued heading to the southwest (185°) and was contacted by the survey team at 11:16 to inform them that they were clear of the whale. At this time, the vessel returned back to a 205° heading. The closest juncture between the vessel and the

whale was one and a half miles, and the only observed reaction from the whale was the changing of heading from northeast to north.

Both of these whale/ship interactions were reported to the NOAA SE Right Whale Recovery Program Coordinator and GDNR within 24 hours of the incident. Also, these interactions have been forwarded to FMRI for inclusion in the NOAA Close-Call Database.

*Media Activities Conducted Under MMPA/ESA Permit No. 775-1600-6*

On two occasions a reporter from First Coast News in Jacksonville, Florida accompanied the Wildlife Trust survey team on a right whale survey. The reporter was collecting footage and interviewing observers and pilots for a story about right whale surveys in the southeast calving grounds. The reporter, Alan Gionet, completed emergency egress training before the flights and followed all required safety procedures during the surveys. The news story focusing on the plight of the North Atlantic right whale aired on 4 and 18 March, 2004 on channel 12 in Jacksonville. The story can be viewed online at <http://www.firstcoastnews.com/news/local/news-article.aspx?storyid=15644>.

### **Discussion and Recommendations**

The right whale calving ground is extremely important to the reproducing population of the North Atlantic right whale and is vital to military and commercial shipping interests. The EWS system attempts to provide protection for right whales from ship collisions within this region. While there have been no documented right whale mortalities due to ship collision in the SEUS in many years, we do not have adequate means of quantifying the success of the EWS system. The expansion of the EWS system to include more daily survey coverage to the north (NEWS) and south of the primary EWS area likely provides more protection for right whales from interactions with large vessels. However, with the increasing number of right whales being observed in Georgia waters to the north of the NEWS survey area and beyond, the concept of again expanding the survey areas is being explored. Consistent right whale sightings and high vessel traffic off the Savannah coast presents a prime area to expand survey effort. Over fifty percent of the right whale sightings from the NEWS surveys this season were documented outside the currently designated right whale critical habitat, continuing to support the expansion of this boundary.

Availability of the survey aircraft was limited during the season due to extended 100 hour maintenance regimes, required pilot down time, unexpected maintenance situations, and limited available flight hours due to strict 100 hour maintenance schedules. Twenty-two survey days were partially or fully restricted due to the above issues. In addition, on nine days during the season the aircraft was requested to cover other areas due to special circumstances such as entangled and/or dead whales. These circumstances, and the lack of availability of a backup aircraft, compromise the effectiveness of the NEWS surveys.

Large areas of the US east coast are without consistent survey efforts, and if we are to protect this species, this issue must be addressed. Limitations of these aerial survey efforts must also be addressed. If our goal is to provide maximum protection for right whales, we must investigate new technologies that may provide a more reliable means for detecting and protecting right whales throughout their range. We must also pursue appropriate shipping management measures. Without moving forward on these fronts it is unlikely that we will ever reach a potential biological removal level of zero for North Atlantic right whales, as calculated by NMFS in the right whale recovery plan.

While we highly recommend identifying other methods of right whale detection and protection, we recognize that in the interim the current survey program is the most effective method we have for

protecting right whales from ship collisions. We recommend continuing daily Northern Early Warning System surveys from 1 December 2004 through 31 March 2005.

### **Acknowledgements**

Data was collected and analyzed by the Wildlife Trust aerial survey crew consisting of Lenisa Tipton, Allison Glass, Jaclyn Daly, and Jennifer Cucksey. We would like to thank the NOAA Twin Otter pilots for their consistent professionalism and maintaining a safe and productive working environment. Georgia Department of Natural Resources and NOAA Southeast Region staff provided support and assistance, which is greatly appreciated. We thank the FMRI and NEA survey teams for covering the NEWS survey area on occasion, and for their continued collaboration and cooperation.

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Appendix 1. Large vessel traffic recorded during the 2003-2004 NEWS right whale aerial surveys.

Date	Time	Latitude	Longitude	Altitude (ft)	Heading	Vessel	Anhead	Angle	Observer	Distance from Line (m)	Comments
07-Dec-03	172403	31.0835	-81.38192	1034	268.3	SV-L			S		
07-Dec-03	171603	31.08447	-81.10686	1012	271.1	MV-O	00	76	P	1237.10	
07-Dec-03	173321	31.03152	-81.1428	995	91.5	MV-C	22	67	S	714.44	
08-Dec-03	160851	31.28315	-80.69398	1080	267	SV-L			P		
08-Dec-03	175243	31.03442	-81.20083	1028	87.2	MV-C	22	62	S	589.27	
08-Dec-03	182404	30.9828	-81.35837	1025	270.1	MV-C	06	89	S	17897.66	
09-Dec-03	185617	30.98412	-81.23268	985	268.8	MV-C	22	89	S	17199.21	
09-Dec-03	144319	31.53245	-80.59286	1058	89.8	MV-B	10	83	S	2626.25	
09-Dec-03	142709	31.53453	-81.13723	1052	97.8	CG-C			P		
09-Dec-03	182856	31.03285	-81.23205	1008	91.2	CG-B			P		
12-Dec-03	183644	30.88303	-80.8359	1020	271.1	MV-L	10	88	P	8902.46	
12-Dec-03	151749	31.38302	-80.65992	1058	270.5	MV-C	03		S		
15-Dec-03	173517	31.035	-81.37713	1061	93	SV-U			S		
15-Dec-03	163604	31.18393	-80.7229	1004	204.5	MV-O	10	88	P	8762.82	
16-Dec-03	190900	30.98623	-81.14987	1044	270.4	MV-C	22	71	S	924.11	
21-Dec-03	144644	31.53503	-80.7747	1035	89.8	MV-B	00	82	S	2244.56	
22-Dec-03	184248	31.08258	-81.34795	1014	269.7	MV-T			P		
22-Dec-03	194220	30.93325	-80.83276	1021	89.7	MV-B	01	88	P	8911.19	
23-Dec-03	174641	31.0827	-81.26155	1012	271.3	MV-C	14	85	S	3525.51	
26-Dec-03	182413	31.03057	-81.22998	1030	91.6	MV-C	24	0	S	0.00	
28-Dec-03	180903	31.03456	-81.26652	1000	90.1	SV-L			S		
29-Dec-03	165540	31.23355	-80.9297	1000	89.9	MV-C	10	88	S	8727.90	
30-Dec-03	211808	31.03427	-81.11295	1000	268.1	MV-O	22	89	P	17461.13	
31-Dec-03	142221	31.53085	-80.93005	1000	91.8	MY-L	08	82	S	2168.66	
31-Dec-03	162825	31.1365	-81.33256	1000	93.4	MV-B	04	79	S	1567.98	
02-Jan-04	194144	31.28637	-80.92686	1000	91.2	MY-L	08	82	S	2168.66	
05-Jan-04	202840	30.88859	-81.27842	1000	263.1	CG-C			P		
08-Jan-04	181535	30.98529	-81.14998	1000	270.3	SV-L	10	71	P	885.16	
08-Jan-04	181605	30.98541	-81.16763	1000	270.6	MY-L	08	76	S	1222.43	
08-Jan-04	184045	30.93038	-80.81968	1000	91.5	MV-C	02	84	P	2899.84	
12-Jan-04	165240	31.08413	-81.34969	1000	271.6	DR-W	05	72	S	938.03	EAGLE 1
13-Jan-04	163728	31.03292	-81.20213	1000	89.4	MV-C	21	74	S	1062.91	
13-Jan-04	162858	31.08377	-81.3316	1000	270.8	DR-T	05	76	S	1222.43	EAGLE 1
14-Jan-04	170241	31.1327	-81.2904	1000	89	DR-U	12	76	S	1222.43	EAGLE 1
14-Jan-04	173602	31.08425	-81.28317	1000	270.3	MV-B	06	75	P	1137.47	
14-Jan-04	174552	31.0333	-81.23528	1000	90.2	MV-C	06	82	S	2168.66	
14-Jan-04	174622	31.03328	-81.2187	1000	89.8	MV-C	06	75	S	1137.47	
17-Jan-04	171809	31.08565	-81.36449	1000	265.7	CRSH	21	86	S	4358.63	
17-Jan-04	172449	31.03357	-81.27811	1000	90.4	DR-W	14	86	P	4358.63	EAGLE 1
17-Jan-04	172639	31.03329	-81.21851	1000	90	DR-W	14	83	P	2482.28	STUYVESANT

Date	Time	Latitude	Longitude	Altitude (ft)	Heading	Vessel	Anhead	Angle	Observer	Distance from Line (m)	Comments
17-Jan-04	174320	30.98485	-80.82685	1000	269.9	MV-B	08	87	P	5815.65	
20-Jan-04	150738	30.98452	-81.05867	1000	88.7	MY-L	09	87	P	5815.65	
20-Jan-04	154249	31.08084	-81.27109	1000	89.3	DR-W	21	0	P	0.00	
21-Jan-04	145726	31.08307	-80.80032	1000	272.7	MV-O	01	85	P	3483.71	
21-Jan-04	151106	31.08401	-81.25804	1000	270.2	DR-T	03	88	P	8727.90	EAGLE ONE
21-Jan-04	151227	31.08396	-81.30321	1000	270.2	DR-W	14	74	P	1062.91	STUYVESANT
22-Jan-04	155627	31.08378	-81.2931	1000	270	DR-W	12	80	P	1728.52	STUYVESANT
22-Jan-04	155817	31.08369	-81.35341	1000	270.2	DR-W	05	70	S	837.39	EAGLE ONE
25-Jan-04	143515	31.52068	-80.55576	1083	174.4	MV-C	08	82	P	2348.66	
25-Jan-04	152856	31.38305	-81.05479	1100	269.6	MY-L	08	81	S	2116.77	
25-Jan-04	174009	31.08302	-81.32352	1084	269.6	DR-T	06	61	S	596.03	EAGLE 1
25-Jan-04	174821	31.03432	-81.24094	1076	90.2	DR-T	01	83	P	2670.93	STUYVESANT
29-Jan-04	145743	31.534	-80.5756	1073	90.3	MV-O	08	67	P	770.44	
29-Jan-04	175929	31.08358	-81.33027	1015	268.9	DR-W	06	78	S	1455.41	EAGLE 1
29-Jan-04	180648	31.03327	-81.27493	997	84.4	DR-T	12	82	S	2162.15	STUYVESANT
29-Jan-04	180929	31.03399	-81.19047	999	87	MV-C	14	58	P	487.27	
30-Jan-04	172612	31.12918	-81.28562	991	91.3	MV-C	12		S		
30-Jan-04	175912	31.08313	-81.3263	1005	270.4	DR-T	06	0	P	0.00	EAGLE 1
30-Jan-04	180732	31.03427	-81.23666	977	88.6	DR-T	10	63	S	584.42	STUYVESANT
30-Jan-04	190224	30.88189	-80.77713	1057	279.6	NV-U	04	58	P	515.56	
31-Jan-04	143014	31.27957	-81.15738	1061	182.9	FV-U			S		
31-Jan-04	144024	31.0806	-81.32095	1066	269.2	DR-W	14	0	P	0.00	EAGLE 1
31-Jan-04	144743	31.03318	-81.26823	1100	86.8	DR-T	10	81	S	2116.77	STUYVESANT
04-Feb-04	174434	31.07765	-81.33105	1100	269.9	DR-T	14	52	P	429.12	EAGLE 1
04-Feb-04	184605	30.93345	-80.79439	1079	87.7	MV-O	02		P		
05-Feb-04	144502	31.10985	-81.38274	1059	192.6	MV-C	21	44	S	311.69	
05-Feb-04	153834	30.98239	-81.1562	966	87.7	MV-B	08	38	P	230.03	
05-Feb-04	160405	31.03353	-81.27634	1031	270.3	MV-C	10	77	P	1361.09	
05-Feb-04	161206	31.0828	-81.28828	1010	91.9	DR-W	08	47	P	330.11	EAGLE 1
05-Feb-04	190530	31.53267	-80.58784	982	278.1	MV-C	07	78	P	1408.09	
10-Feb-04	190230	31.18328	-81.2361	1059	268.8	MV-B	00	82	P	2296.61	
10-Feb-04	194302	31.08007	-81.29118	1069	271.2	DR-W	10	80	P	1847.79	EAGLE 1
10-Feb-04	203033	30.98383	-81.3758	1023	266.8	MV-C	02	85	S	3563.84	
10-Feb-04	210244	30.88358	-81.06816	1046	269.9	MV-L	02	87	P	6083.17	
15-Feb-04	190759	31.13072	-81.31419	1078	79.7	CRSH	08	72	S	1011.20	CASINO BOAT
15-Feb-04	194140	31.08309	-81.30565	1100	268.3	DR-T	06	25	P	156.34	EAGLE 1
15-Feb-04	195619	31.0338	-81.0639	1100	89.5	MV-C	12	83	S	2730.50	
16-Feb-04	160806	31.0732	-81.31213	1064	257.5	DR-T	14	5	P	28.37	EAGLE 1
18-Feb-04	182648	31.08362	-81.3103	1020	272.7	DR-W	14	80	P	1763.09	EAGLE 1
18-Feb-04	183550	31.03317	-81.23174	1031	89.1	MV-C	01	66	S	705.78	
19-Feb-04	182718	31.08407	-81.30724	1100	266.8	MV-C	14	72	P	1031.84	
19-Feb-04	182919	31.08545	-81.37541	982	276.7	MV-C	12	80	S	1697.41	
19-Feb-04	185939	31.03408	-81.2653	1029	88.1	DR-T	06	81	P	1980.14	EAGLE 1
19-Feb-04	200501	30.8842	-80.89539	1064	275.4	NV-U	04	83	P	2641.14	
20-Feb-04	171318	31.23385	-80.98457	1046	90.1	MY-L	10	74	P	1111.81	

Date	Time	Latitude	Longitude	Altitude (ft)	Heading	Vessel	Anhead	Angle	Observer	Distance from Line (m)	Comments
20-Feb-04	173838	31.18352	-81.24841	1017	268.9	MV-B	01	39	P	251.01	
20-Feb-04	181828	31.08372	-81.31463	988	269.9	DR-T	06	73	P	984.94	EAGLE 1
20-Feb-04	181930	31.08355	-81.34838	986	269.4	MV-C	13	77	S	1301.69	
20-Feb-04	182658	31.03357	-81.25065	1038	96.8	MY-L	12	84	P	3010.03	
20-Feb-04	192631	30.88405	-80.9002	1045	272.4	MV-O	10	87	P	6077.35	
22-Feb-04	183727	31.0834	-81.26773	1023	270.2	SV-L	12	82	P	2218.54	
22-Feb-04	184635	31.03321	-81.26	1024	89.3	DR-T	10	74	S	1088.42	EAGLE 1
22-Feb-04	200959	31.12737	-81.36098	1090	338.6	CRSH	12	64	S	681.14	CASINO BOAT
23-Feb-04	200136	31.03437	-81.16145	977	85.6	MV-O	04	19	P	102.53	
28-Feb-04	171125	31.0832	-81.31455	1037	271.4	DR-T	14	65	P	677.80	EAGLE 1
28-Feb-04	171305	31.08355	-81.37263	1025	269.4	CRSH	04	85	S	3570.80	CASINO BOAT
29-Feb-04	182801	31.0844	-81.28338	950	274.1	DR-T	13	82	P	2060.23	EAGLE 1
01-Mar-04	153520	31.08353	-81.29892	1055	268.3	DR-T	05	83	P	2618.80	EAGLE 1
11-Mar-04	193721	31.10462	-80.77612	1077	185	NV-L	02	83	P	2673.41	
11-Mar-04	201023	31.08402	-81.2939	1100	268.2	MV-B	14	78	P	1577.29	
12-Mar-04	163718	31.28337	-81.26888	1027	264.2	FV-T	04	85	S	3577.77	
12-Mar-04	175250	31.08285	-81.2715	1064	268.3	MV-T	21	82	P	2307.45	
12-Mar-04	180252	31.03478	-81.21552	1061	90.4	MV-C	22	55	S	461.83	
13-Mar-04	165948	31.08344	-81.30883	1117	269.4	MV-T	10	81	P	2149.49	
13-Mar-04	170258	31.06683	-81.40075	1076	181.9	CRSH	04	83	P	2670.93	CASINO BOAT
14-Mar-04	183944	30.94877	-81.3787	1026	270	MV-B	10	84	S	2975.23	
14-Mar-04	175545	31.0832	-81.32762	1064	269.8	MV-T	12	11	P	63.04	
15-Mar-04	174644	31.03742	-81.27226	1037	92.8	MV-B	21	81	P	1995.54	
17-Mar-04	174507	31.13355	-81.22739	1100	90.1	MV-B	00	86	P	4794.49	
17-Mar-04	181518	31.08183	-81.27683	1078	268.8	MV-T	12	79	P	1690.29	
18-Mar-04	153718	31.03652	-81.25305	1078	1078	MV-B	21	81	P	2074.44	
18-Mar-04	154138	31.03595	-81.1077	1084	1084	MV-C	21	64	P	677.39	
18-Mar-04	154718	31.03402	-80.9226	1062	1062	MV-C	10	88	S	9269.03	
19-Mar-04	225037	31.12645	-81.3710	1100	8.5	MV-C	04	82	P	2385.52	
20-Mar-04	174933	31.08418	-81.35805	1100	267.1	CRSH	21	79	S	1724.78	CASINO BOAT
20-Mar-04	184713	30.93472	-81.06678	1100	84	MV-C	14	81	S	2116.77	
21-Mar-04	150618	31.38337	-80.82162	1089	270.5	MV-B	0	85	P	3793.76	
25-Mar-04	173658	31.08275	-81.30354	1051	269.3	MV-C	14	N/A	P	N/A	
25-Mar-04	184149	30.89167	-80.76503	1057	196.2	MV-C	04	62	P	605.89	
28-Mar-04	151141	31.08312	-81.25899	1100	269.9	MV-C	04	82	P	2385.52	
28-Mar-04	151330	31.08297	-81.32059	1100	269.9	DR-U	21	72	P	1031.84	
30-Mar-04	153639	31.03483	-81.27727	1040	90.6	MV-B	21	84	P	3015.83	
30-Mar-04	152709	31.08332	-81.27002	1036	269.8	DR-T	04	84	P	3004.23	
31-Mar-04	151434	31.08239	-81.3036	1032	270.2	DR-W	06	82	P	2238.06	