



FINAL REPORT TO
GEORGIA DEPARTMENT OF NATURAL RESOURCES

Monitoring North Atlantic Right Whales off the Coasts of
South Carolina and Georgia
2005 – 2006

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Submitted by:

WILDLIFE TRUST
AQUATIC CONSERVATION PROGRAM

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Introduction

The North Atlantic right whale, *Eubalaena glacialis*, is listed as a federally-protected endangered species under the Endangered Species Act, in addition to being protected by the Marine Mammal Protection Act. There are estimated to be approximately 300 individuals remaining in the population, and recent data suggest that the population has been declining at a rate of 2.4% since 1991. An increase in calving intervals also heightens the effects of each birth and mortality on the survival of the species. A slow reproductive rate is further hindered by human-related mortality, the largest known threat to the species, including ship impacts and entanglement in fishing gear (NMFS, 1991). It is essential that mitigation measures are enacted quickly and efficiently to minimize human-related mortality, particularly in the calving grounds of the Southeast United States (SEUS).

Right whales are slow moving, especially when accompanied by a calf, and are often not easily seen at the water's surface due to the lack of a dorsal fin. These factors make them vulnerable to ship strikes, especially in areas of increased vessel traffic and dredging activities. The winter calving grounds off Georgia and northern Florida have been designated as critical habitat for right whales in the SEUS. An Early Warning System (EWS) was created to alert military and commercial vessels transiting the critical habitat area of the presence of right whales. The region just north of the critical habitat, including northern Georgia and South Carolina, has long been believed to be an important migratory route. However, recent survey effort and photo-identification data has suggested that some individuals utilize this area not only as a migratory route, but as a residency area as well. Resource managers are currently unsure about the extent or the importance of this southern mid-Atlantic region to the reproducing population. In addition, continuing mortality from ship strikes and gear entanglement in the mid-Atlantic region is of concern to researchers and managers. It is presently undecided whether to include this area as part of the Southeast or the mid-Atlantic management units when making conservation decisions. The purpose of this aerial survey effort is to provide more complete information to allow these important management questions to be answered.

By providing more complete aerial survey coverage of the entire Georgia/South Carolina area, researchers will develop a better understanding of the residency areas utilized by calving females and other members of the population. The question has frequently been raised as to whether the SEUS critical habitat should be expanded, or whether the mid-Atlantic should be designated as an additional critical habitat area during specific times of the year. Through this multi-year study we hope to provide managers with a more thorough understanding of right whale distribution and residency in the region to assist with time-critical management decisions.

This study will also serve as an aid to the research being conducted by NOAA Fisheries to test the feasibility of using passive acoustic monitoring devices, or pop up buoys, to detect the presence of right whales in the Southeast/mid-Atlantic areas. The aerial survey team will be used to groundtruth the data collected by these passive devices by visually detecting the presence of right whales in the area during a survey, and comparing sightings observed to right whale locations detected by the passive detection devices.

Methods

Study Area

The South Carolina (SC) survey season began on 24 November 2005 and concluded on 15 April 2006. The SC survey area for the 2005/2006 season extended from North Myrtle Beach, SC to the northern end of Sapelo Island, GA. The survey area was divided into three sections: northern, middle and southern. The northern area extended from North Myrtle Beach, SC to Cape Romain, SC and consisted of sixteen southeast/northwest transect lines of varied lengths (35.1 - 35.3 nm) which were flown at approximately 4 nm intervals. The middle area extended from Cape Romain, SC to Fripp Island, SC and consisted of sixteen southeast/northwest transect lines of varied lengths (35.3 - 35.4 nm) which were also flown at approximately 4 nm intervals. The southern section extended from Hilton Head Island, SC to Sapelo Island, GA and consisted of fourteen east/west transect lines of varied lengths (11.7 – 29.0 nm) which were flown at 3 nm intervals (figure 1). The northern and middle transit lines were flown in a southeast/northwest direction as opposed to the east/west direction of the southern section in order to cover a larger bathymetric range as well as to provide visual data to substantiate the acoustic data collected by passive detection devices located in the area. A complete northern survey consisted of 563.4 nm of trackline flown. A complete middle survey consisted of 565.2 nm of trackline flown. A complete southern survey consisted of 323.5 nm of trackline flown (table 1). These totals do not include miles flown in transit to, from, and between transect lines. The survey aircraft departed from East Cooper Airport in Mt. Pleasant, SC each day. After completing half of the survey lines for the day, the plane would break for fuel and to provide a break for observers to avoid observer fatigue. When flying in the northern section, the plane would refuel at Georgetown Airport in Georgetown, SC. In the middle section the plane would refuel at East Cooper Airport. In the southern section, the plane would refuel at Hilton Head Airport in Hilton Head, SC or at Frogmore Airport in Beaufort, SC. The plane returned to East Cooper Airport at the end of each normal survey day. Without whale sightings, a complete northern survey took approximately 7.9 hobbs hours to finish, a complete middle section took approximately 7.6 hours, and a complete southern section took approximately 6.2 hours. This includes transit times to and from the airports.

Table 1: South Carolina survey transects for the 2005-2006 calving season.

| Track Line | Length(nm) | Latitude West | Longitude West | Latitude East | Longitude East |
|------------|------------|---------------|----------------|---------------|----------------|
| 1 | 29 | 31 34.8 | -81 7.8 | 31 34.8 | -80 34.2 |
| 2 | 28.1 | 31 37.8 | -81 7.2 | 31 37.8 | -80 34.2 |
| 3 | 28.1 | 31 40.8 | -81 7.2 | 31 40.8 | -80 34.2 |
| 4 | 27.3 | 31 43.8 | -81 6.0 | 31 43.8 | -80 34.2 |
| 5 | 28.1 | 31 46.8 | -81 3.0 | 31 46.8 | -80 30.0 |
| 6 | 25.5 | 31 49.8 | -81 0.0 | 31 49.8 | -80 30.0 |
| 7 | 26.4 | 31 52.8 | -80 57.0 | 31 52.8 | -80 25.8 |
| 8 | 23.8 | 31 55.8 | -80 54.0 | 31 55.8 | -80 25.8 |
| 9 | 26.3 | 31 58.8 | -80 51.0 | 31 58.8 | -80 25.8 |
| 10 | 18.8 | 32 01.8 | -80 48.0 | 32 01.8 | -80 25.8 |
| 11 | 19.4 | 32 04.8 | -80 45.0 | 32 04.8 | -80 22.2 |
| 12 | 16.8 | 32 07.8 | -80 42.0 | 32 07.8 | -80 22.2 |
| 13 | 14.2 | 32 10.8 | -80 39.0 | 32 10.8 | -80 22.2 |
| 14 | 11.7 | 32 13.8 | -80 36.0 | 32 13.8 | -80 22.2 |
| 15 | 35.4 | 32 20.4 | -80 27.0 | 31 53.4 | -80 0.0 |
| 16 | 35.4 | 32 24.6 | -80 25.2 | 31 57.6 | -79 58.2 |
| 17 | 35.4 | 32 29.4 | -80 23.4 | 32 2.4 | -79 56.4 |
| 18 | 35.4 | 32 30.0 | -80 18.0 | 32 3.0 | -79 51 |
| 19 | 35.3 | 32 32.4 | -80 13.8 | 32 5.4 | -79 46.8 |
| 20 | 35.3 | 32 34.2 | -80 9.6 | 32 7.2 | -79 42.6 |
| 21 | 35.3 | 32 36.0 | -80 4.8 | 32 9.0 | -79 37.8 |
| 22 | 35.3 | 32 37.2 | -79 59.4 | 32 10.2 | -79 32.4 |
| 23 | 35.3 | 32 39.6 | -79 55.8 | 32 12.6 | -79 28.8 |
| 24 | 35.3 | 32 42.6 | -79 52.8 | 32 15.6 | -79 25.8 |
| 25 | 35.3 | 32 45.6 | -79 49.2 | 32 18.6 | -79 22.2 |
| 26 | 35.3 | 32 48.0 | -79 45 | 32 21.0 | -79 18.0 |
| 27 | 35.3 | 32 51.0 | -79 42.0 | 32 24.0 | -79 15.0 |
| 28 | 35.3 | 32 53.4 | -79 37.8 | 32 26.4 | -79 10.8 |
| 29 | 35.3 | 32 58.2 | -79 36.6 | 32 31.2 | -79 9.6 |
| 30 | 35.3 | 33 1.2 | -79 33.6 | 32 34.2 | -79 6.6 |
| 31 | 35.3 | 33 0.6 | -79 26.4 | 32 33.6 | -78 59.4 |
| 32 | 35.3 | 33 1.2 | -79 21.0 | 32 34.2 | -78 54.0 |
| 33 | 35.3 | 33 6.0 | -79 19.2 | 32 39.0 | -78 52.2 |
| 34 | 35.3 | 33 7.8 | -79 15.0 | 32 40.8 | -78 48.0 |
| 35 | 35.2 | 33 10.8 | -79 11.4 | 32 43.8 | -78 44.4 |
| 36 | 35.2 | 33 16.2 | -79 10.8 | 32 49.2 | -78 43.8 |
| 37 | 35.2 | 33 21.0 | -79 9.0 | 32 54.0 | -78 42.0 |
| 38 | 35.2 | 33 25.8 | -79 7.2 | 32 58.8 | -78 40.2 |
| 39 | 35.2 | 33 29.4 | -79 4.8 | 33 2.4 | -78 37.8 |
| 40 | 35.2 | 33 32.4 | -79 1.2 | 33 5.4 | -78 34.2 |
| 41 | 35.2 | 33 36.0 | -78 58.8 | 33 9.0 | -78 31.8 |
| 42 | 35.2 | 33 39.0 | -78 55.2 | 33 12.0 | -78 28.2 |
| 43 | 35.2 | 33 42.0 | -78 52.2 | 33 15.0 | -78 25.2 |
| 44 | 35.2 | 33 45.0 | -78 48.6 | 33 18.0 | -78 21.6 |
| 45 | 35.1 | 33 47.4 | -78 44.4 | 33 20.4 | -78 17.4 |
| 46 | 35.1 | 33 49.2 | -78 40.2 | 33 22.2 | -78 13.2 |

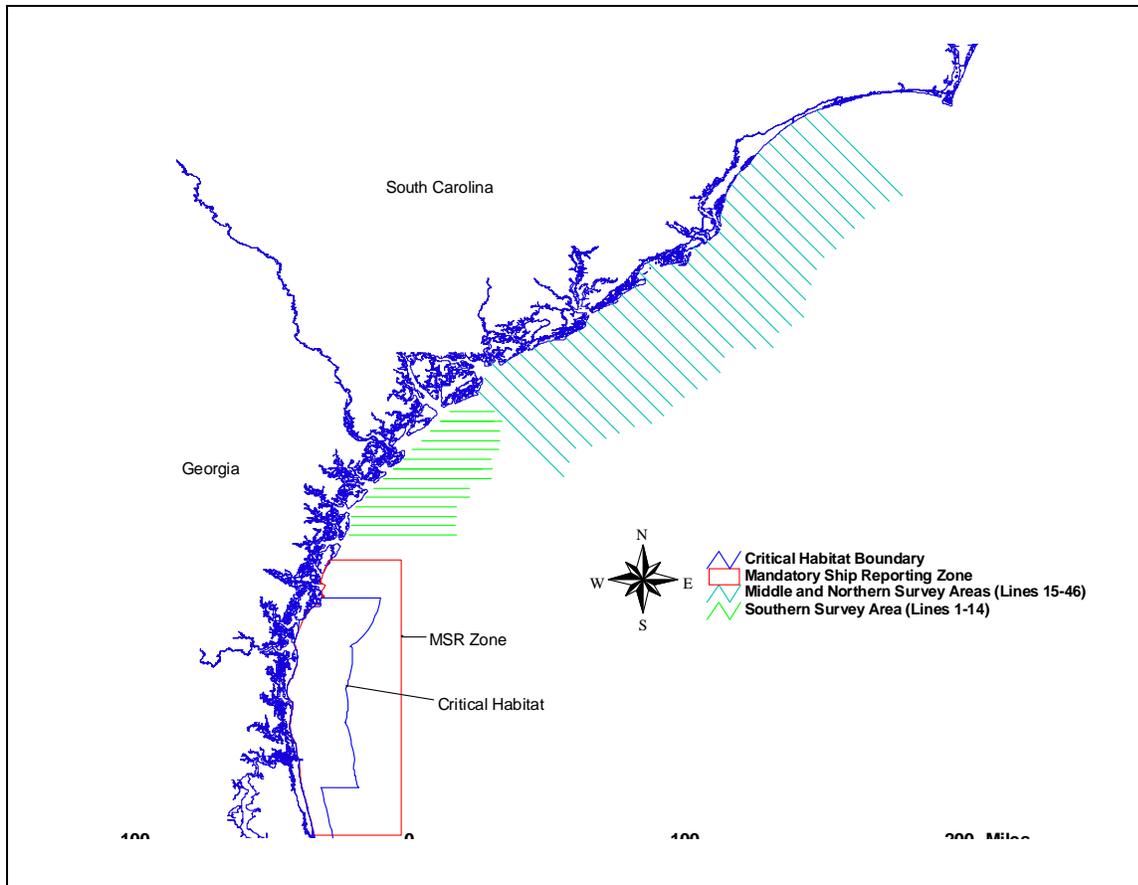


Figure 1: Map of SC survey tracklines flown from 24 November 2005 - 15 April 2006.

Aerial Surveys

Surveys were scheduled to be flown daily from 15 November 2005 through 15 April 2006, weather permitting, under VFR (visual flight rules) conditions. Due to a delay in contract paperwork, surveys began on 24 November 2005. Surveys were conducted in a Cessna 337 Skymaster aircraft owned and operated by Orion Aviation. The aircraft was equipped with a Global Positioning System (GPS), 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, and streamers 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.

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 northernmost trackline of the section acting as the start point. However, the section flown, the start point and direction of flight was determined daily, based on weather conditions throughout the survey area and other survey factors. Spreading survey effort equally amongst the survey areas was also a factor. 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 and two observers. The observers were positioned on

either side of the aircraft behind the pilot and co-pilot seats. All events, sightings, and changes in physical conditions were recorded on a laptop computer, positioned in front of and between the two observers, using Logger 2000, a software program designed for marine data entry. To minimize time spent looking away from the window, when an event occurred the left observer recorded the time and position of the event on the computer while the right observer recorded the time and pertinent event information into a handheld digital voice recorder. Time, location, number, and species of all large whales were recorded. In addition, all types of large vessels (over 33m in length) observed in the survey area were recorded. From 24 November 2005 through 30 December 2005, the survey plane broke track to circle over and obtain the exact location for vessels over 100 m within the survey area. Due to the extended length of the surveys, it was determined that this protocol was preventing the completion of the entire survey route, therefore starting on 30 December 2005 sighting angles for the vessels were recorded using a digital inclinometer. When the inclinometer was unable to be used distance to large vessels was estimated by the observers. Sighting distance for all large whales was calculated from 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 a GPS location. The aircraft also circled over each right whale encountered to obtain photographs. 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 ($lat_1, long_1$), and the lat/long exact overhead position of the right whale ($lat_2, long_2$). The whale's distance in nautical miles from the trackline was determined by subtracting the distance between the two latitude positions. 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.

Notification of Right Whale Sighting Information

Upon completing data collection for each right whale sighting, the aircraft would immediately attempt to contact Fleet Area Control and Surveillance Facility (FACSFACJAX) at Naval Air Station Jacksonville. This was usually accomplished via satellite phone. The plane would either call the designated ground contact for the day to have them relay the information to FACSFACJAX via phone or the plane would contact FACSFACJAX directly. If either of these methods were unsuccessful, the information was 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 death or injury 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 SC aerial surveys were photographed in order to identify individual animals.

During a right whale sighting, the left observer recorded all sighting information into the voice recorder and entered the sighting positions into the computer. If possible, the observer also sketched the right whales being photographed, including callosity patterns and body scarring, and recorded observed behaviors. The aircraft would circle at an altitude of 1000 ft (303m) over the animal(s) while the right observer photographed the animals through the co-pilot's sliding window, or through the right observer window which could be opened. Photographs were taken of callosity patterns and any body scarring using a Canon 20D digital camera with a fixed 300 mm image stabilizing lens. 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 2005-2006 SC survey season. Preliminary photo analysis by the SC Wildlife Trust team and initial verification by New England Aquarium has been completed and all photographs taken during the 2005-2006 season have been forwarded to the researchers at the New England Aquarium for final confirmation.

Results

Aerial Surveys

A total of 67 South Carolina Right Whale (SCRW) surveys were flown during the 143 available survey days of the 2005-2006 right whale calving season (Table 2). On 17 March 2006 a dedicated search was flown to relocate the carcass of a dead humpback. This flight used 3.3 hobbs hours. A total of 405.6 hours of hobbs time was logged for the SCRW season, averaging 6.6 hours of hobbs time per survey in the northern section, 5.7 hours in the middle, and 4.8 hours in the southern. A total of 8834.9 nautical miles (nm) of trackline were flown in the northern section, 9619.9 nm in the middle, and 6160.0 nm in the southern, giving an overall total of 24614.8 nm. 16649.1 nm (67.6%) of this total were flown in a sea state of 3 or less: 5300.8 nm (60.0%) in the northern section, 7154.8 nm (74.4%) in the middle, and 4193.5 nm (68.1%) in the southern. The northern survey area was completed nine times during the season and partially completed 11 times. The middle survey area was completed on nine survey days and partially completed on 16 days. The southern survey area was completed 15 times and partially completed seven times. The 34 partial SCRW flights were largely due to factors such as weather and sea state conditions. From 28 March to 04 April 2006, half surveys were flown in an effort to ration the remaining flight hours to ensure there would be enough hours to cover the remaining survey days during the critical migratory period.

Days with no survey effort in the SCRW survey area were primarily due to unacceptable weather conditions. The survey team did not fly on 30 November 2005 due to the SEUS aerial survey team meeting in Fernandina, FL. The survey team did not fly on 09 February 2006 due to 100-hr maintenance on the plane.

Entangled Whales

There was one flight involving an entangled whale. On 01 January 2006, EGNO 3346, also known as “Kingfisher”, was sighted with two other adults at 14:45 at 31°35.25N 080°43.70W. This animal was not identified while in the field. The entangling gear was not observed in the field nor was seen in the photographs until after the animal was identified. In only one image is the gear barely discernible (Figure 2). “Kingfisher” has been entangled since 17 March 2004 and is currently under the status of “monitor”. Photographs from the sighting were immediately sent to the Disentanglement Team at the Provincetown Center for Coastal Studies in Provincetown, MA.



Figure 2: EGNO 3346, Kingfisher, with entangling gear on right pectoral flipper.

Dead Whales

Three reports of dead whales were received and investigated this season. A large whale carcass was sighted off of Charleston on 08 January 2006 by a fishing vessel. The carcass was reported to the Northeast Fisheries Science Center on 09 January 2006. The sighting information was forwarded to the SCRW survey team that same day. After interviewing the person who reported the carcass, it appeared that the carcass was a humpback whale, which was confirmed when

photographs were received the afternoon of 10 January 2006. No flight was launched to relocate the carcass due to the time elapsed since the initial sighting and inclement weather.

During a survey of the northern area conducted on 10 January 2006, the flight crew heard a private sailboat reporting a whale carcass to Coast Guard Station Charleston on marine band channel 16. The reported position was within the northern survey area. The team broke track, relocated the carcass, which was a humpback whale, and documented it, then resumed the survey. During the return transit home, the plane relocated the carcass to provide an updated location to SCDNR and Wayne McFee of NOAA. On 11 January 2006, the flight crew flew a dedicated search to relocate the carcass for a necropsy team from South Carolina Department of Natural Resources. After it had been located, the team flew a complete survey. Approximately 1.2 flight hours were used for this dead whale during 10 January and 11 January 2006.

On 16 March 2006 a large whale carcass was reported by a merchant vessel. No conclusive information was provided to determine the species. On 17 March 2006, the SCRW survey team flew a dedicated search to relocate the carcass. The crew found and documented a dead humpback roughly 1 nm NE of the reported position from the previous day. No survey was flown due to high seas. 3.3 flight hours were used to locate the dead whale.

Table 2: Survey effort for the SCRW surveys conducted from 24 November 2005 - 15 April 2006. S = southern survey, N = northern survey, M = middle survey.

| Date | Complete Surveys | Partial Surveys | Survey Hobbs Time | Total trackline miles flown | Trackline miles flown in Beaufort SS ≤ 3 | Number of whales seen | Comments |
|-----------|------------------|-----------------|-------------------|-----------------------------|---|-----------------------|---------------------------|
| 15-Nov-05 | | | 1.3 | | | | test flight |
| 1-Dec-05 | | M | 8.1 | 527.2 | 268.5 | 2 | |
| 3-Dec-05 | | N | 8.2 | 552.9 | 493 | 2 | |
| 5-Dec-05 | | S | 3.5 | 137.7 | 55.6 | 0 | |
| 7-Dec-05 | N | | 8.4 | 563.4 | 152 | 0 | |
| 10-Dec-05 | | N | 6.9 | 492.8 | 296 | 0 | |
| 12-Dec-05 | | S | 6.2 | 261.4 | 67.3 | 2 | |
| 16-Dec-05 | | M | 4.1 | 190.6 | 92.2 | 0 | |
| 17-Dec-05 | | M | 2.7 | 168.7 | 0 | 0 | |
| 19-Dec-05 | | S | 4.3 | 207.7 | 207.7 | 0 | |
| 20-Dec-05 | | M | 1.9 | 106.5 | 7.3 | 0 | |
| 23-Dec-05 | | N | 7.6 | 538.5 | 320 | 0 | |
| 24-Dec-05 | S | | 6.8 | 323.5 | 323.5 | 0 | |
| 27-Dec-05 | M | | 8.3 | 565.2 | 220.2 | 0 | |
| 28-Dec-05 | N | | 7.9 | 563.4 | 112.06 | 0 | |
| 30-Dec-05 | S | | 5.9 | 323.5 | 287.4 | 2 | |
| 1-Jan-06 | | M | 6.4 | 282.4 | 282.4 | 0 | |
| 4-Jan-06 | S | | 7.4 | 323.5 | 323.5 | 12 | 11 individuals, 1 resight |
| 5-Jan-06 | | M | 3.6 | 207.6 | 12.4 | 0 | |

| Date | Complete Surveys | Partial Surveys | Survey Hobbs Time | Total trackline miles flown | Trackline miles flown in Beaufort SS ≤ 3 | Number of whales seen | Comments |
|-----------|------------------|-----------------|-------------------|-----------------------------|---|-----------------------|-------------------------------------|
| 7-Jan-06 | M | | 7.6 | 565.2 | 312.7 | 0 | |
| 8-Jan-06 | S | | 6.4 | 323.5 | 138 | 1 | |
| 10-Jan-06 | | N | 6.9 | 422.8 | 422.8 | 0 | 1 dead humpback |
| 11-Jan-06 | | M | 6.4 | 423.6 | 385.9 | 0 | 1 dead humpback |
| 12-Jan-06 | | S | 3.4 | 98.2 | 98.2 | 0 | |
| 13-Jan-06 | | M | 4 | 282.8 | 255.3 | 0 | |
| 16-Jan-06 | | N | 6.5 | 423.2 | 53 | 0 | |
| 19-Jan-06 | S | | 6 | 323.5 | 323.2 | 0 | |
| 20-Jan-06 | M | | 7.6 | 565.2 | 547.6 | 0 | |
| 21-Jan-06 | N | | 7.8 | 563.4 | 554 | 0 | |
| 24-Jan-06 | | S | 4.2 | 216.3 | 213.3 | 0 | |
| 28-Jan-06 | M | | 7.6 | 565.2 | 482.7 | 0 | |
| 1-Feb-06 | N | | 8.2 | 563.4 | 397.2 | 0 | 1 humpback |
| 2-Feb-06 | | S | 5.5 | 292.5 | 78.8 | 0 | |
| 6-Feb-06 | S | | 6.1 | 323.5 | 320.2 | 2 | |
| 8-Feb-06 | | N | 4.6 | 282 | 187.2 | 2 | |
| 10-Feb-06 | M | | 7.6 | 565.2 | 565.2 | 0 | |
| 13-Feb-06 | | M | 3 | 197.8 | 52.7 | 0 | |
| 14-Feb-06 | S | | 6.2 | 323.5 | 106.7 | 0 | |
| 15-Feb-06 | N | | 8.1 | 563.4 | 175.7 | 2 | |
| 16-Feb-06 | M | | 7.6 | 565.2 | 519.9 | 0 | |
| 17-Feb-06 | S | | 6.9 | 323.5 | 323.5 | 3 | |
| 18-Feb-06 | | M | 6.9 | 494.4 | 487.2 | 0 | |
| 24-Feb-06 | N | | 7.8 | 563.4 | 389.5 | 0 | |
| 25-Feb-06 | | M | 4.3 | 282.8 | 277.4 | 3 | |
| 27-Feb-06 | S | | 6 | 325.1 | 303.5 | 0 | |
| 3-Mar-06 | S | | 6.1 | 295.1 | 233.9 | 2 | |
| 4-Mar-06 | | N | 4.1 | 209.9 | 199.8 | 1 | |
| 5-Mar-06 | S | | 7.5 | 323.5 | 39.7 | 16 | 1 during transit, includes resights |
| 8-Mar-06 | N | | 7.8 | 563.4 | 468.3 | 0 | |
| 9-Mar-06 | M | | 7.7 | 565.2 | 433 | 0 | |
| 11-Mar-06 | S | | 6.9 | 347.3 | 347.3 | 4 | Mom/calf on transit, resighted. |
| 12-Mar-06 | | M | 5 | 282.8 | 282.8 | 11 | |
| 13-Mar-06 | | M | 4.5 | 238.3 | 174.9 | 11 | |
| 16-Mar-06 | N | | 7.7 | 550.8 | 102 | 0 | |
| 17-Mar-06 | | | 3.3 | 0 | 0 | 0 | search for dead whale |
| 19-Mar-06 | | S | 3.6 | 96.7 | 11.3 | 0 | |
| 20-Mar-06 | | N | 4.7 | 211.6 | 34 | 6 | |
| 23-Mar-06 | | N | 0.9 | 9.4 | 0 | 0 | |

| Date | Complete Surveys | Partial Surveys | Survey Hobbs Time | Total trackline miles flown | Trackline miles flown in Beaufort SS ≤ 3 | Number of whales seen | Comments |
|---------------|------------------|-----------------|-------------------|-----------------------------|---|-----------------------|----------|
| 25-Mar-06 | | M | 4.1 | 282.4 | 37.3 | 1 | |
| 27-Mar-06 | S | | 6.1 | 323.5 | 119.5 | 0 | |
| 28-Mar-06 | | N | 5.1 | 352.4 | 240.4 | 0 | |
| 29-Mar-06 | | M | 4.1 | 282.8 | 282.8 | 0 | |
| 31-Mar-06 | | N | 4.6 | 281.4 | 281.4 | 0 | |
| 2-Apr-06 | | M | 3.6 | 282.4 | 282.4 | 0 | |
| 5-Apr-06 | S | | 6.1 | 323.5 | 187.3 | 0 | |
| 6-Apr-06 | M | | 7.5 | 565.2 | 326.8 | 0 | |
| 12-Apr-06 | N | | 8.3 | 563.4 | 422.4 | 0 | |
| 13-Apr-06 | M | | 7.3 | 565.2 | 565.2 | 0 | |
| 14-Apr-06 | S | | 6.3 | 323.5 | 84.1 | 0 | |
| | | | | | | | |
| Total | 33 | 34 | 405.6 | 24614.8 | 16649.1 | 85 | |
| | | | | | | | |
| North | 9 | 11 | 132.1 | 8834.9 | 5300.76 | 13 | |
| Middle | 9 | 16 | 141.5 | 9619.9 | 7154.8 | 28 | |
| South | 15 | 7 | 127.4 | 6160 | 4193.5 | 44 | |

Right Whale Sightings and Identifications

Forty right whale sightings were documented during SCRW surveys, consisting of 85 animals (Figure 3). Nine cow/calf pairs, 15 single animals, and 16 groups of two or more adult/juvenile right whales were documented; these totals include animals resighted in a single day. One sighting resulted in no photographic documentation of an animal due to its elusive behavior. Preliminary photoanalysis by the SC Wildlife Trust team and verification by New England Aquarium has resulted in the identification of 7 individual cow/calf pairs and 27 individual adult/juvenile whales which account for 58 of the 85 animals sighted during the season (Table 3). Twenty-six individual whales have not been identified at the time of this report. All right whale identification information included in this report should not be considered confirmed until the New England Aquarium completes the confirmation process. All demographic information and uniqueness of sightings to this survey area has been provided in Table 4. Further information will be unavailable until verified information is provided by the New England Aquarium. Locations of the 40 SCRW right whale sightings by month are depicted in Figure 4.

Table 3: SCRW right whale sightings from 24 November 2005 - 15 April 2006.

| Sighting # | Month | Day | Year | Time (L) | Survey Name | DecLat | DecLong | RIWH Letter | EGNO | Sight Dist (nm) |
|------------|-------|-----|------|----------|-------------|----------|----------|-------------|----------|-----------------|
| 1 | 12 | 1 | 2005 | 16:43 | SCRW051201 | 32.26300 | 80.39783 | A | SE06BK03 | 0.81 |
| 2 | 12 | 1 | 2005 | 16:43 | SCRW051201 | 32.26300 | 80.39783 | B | SE06BK04 | 0.81 |
| 3 | 12 | 3 | 2005 | 16:19 | SCRW051203 | 32.89933 | 79.35883 | A | SE06BK03 | 1.17 |
| 4 | 12 | 3 | 2005 | 16:19 | SCRW051203 | 32.89933 | 79.35883 | B | SE06BK04 | 1.17 |
| 5 | 12 | 12 | 2005 | 11:41 | SCRW051212 | 31.78666 | 80.95666 | A | 2660 | 0.36 |

| Sighting # | Month | Day | Year | Time (L) | Survey Name | DecLat | DecLong | RIWH Letter | EGNO | Sight Dist (nm) |
|------------|-------|-----|------|----------|-------------|----------|----------|-------------|-----------|-----------------|
| 6 | 12 | 12 | 2005 | 12:49 | SCRW051212 | 31.88166 | 80.74000 | B | 2710 | 0.18 |
| 7 | 12 | 30 | 2005 | 13:34 | SCRW051230 | 31.58667 | 81.02400 | A | 1802 | 0.51 |
| 8 | 12 | 30 | 2005 | 13:34 | SCRW051230 | 31.58667 | 81.02400 | B | CALF | 0.51 |
| 9 | 01 | 04 | 2006 | 10:51 | SCRW060104 | 31.84983 | 80.81900 | A | 1151 | 2.03 |
| 10 | 01 | 04 | 2006 | 10:51 | SCRW060104 | 31.84983 | 80.81900 | B | 1281 | 2.03 |
| 11 | 01 | 04 | 2006 | 12:38 | SCRW060104 | 31.86283 | 80.80267 | C | SE06BK01 | 1.54 |
| 12 | 01 | 04 | 2006 | 12:48 | SCRW060104 | 31.86000 | 80.76433 | D | 1281 | 1.37 |
| 13 | 01 | 04 | 2006 | 14:29 | SCRW060104 | 31.59700 | 80.74467 | E | SE06CT05 | 2.08 |
| 14 | 01 | 04 | 2006 | 14:29 | SCRW060104 | 31.59700 | 80.74467 | F | SE06CT02 | 2.08 |
| 15 | 01 | 04 | 2006 | 14:29 | SCRW060104 | 31.59700 | 80.74467 | G | SE06BK05 | 2.08 |
| 16 | 01 | 04 | 2006 | 14:29 | SCRW060104 | 31.59700 | 80.74467 | H | SE06BK06 | 2.08 |
| 17 | 01 | 04 | 2006 | 14:29 | SCRW060104 | 31.59700 | 80.74467 | I | 3260 | 2.08 |
| 18 | 01 | 04 | 2006 | 14:45 | SCRW060104 | 31.58750 | 80.72834 | J | SE06CT01 | 2.65 |
| 19 | 01 | 04 | 2006 | 14:45 | SCRW060104 | 31.58750 | 80.72834 | K | 3346 | 2.65 |
| 20 | 01 | 04 | 2006 | 14:45 | SCRW060104 | 31.58750 | 80.72834 | L | SE06BK08 | 2.65 |
| 21 | 01 | 08 | 2006 | 12:53 | SCRW060108 | 31.76417 | 80.82417 | A | 1151 | 2.18 |
| 22 | 02 | 06 | 2006 | 11:24 | SCRW060206 | 31.91483 | 80.48701 | A | 1946 | 0.85 |
| 23 | 02 | 06 | 2006 | 11:24 | SCRW060206 | 31.91483 | 80.48701 | B | CALF | 0.85 |
| 24 | 02 | 08 | 2006 | 9:14 | SCRW060208 | 32.93084 | 79.24516 | A | | 0.40 |
| 25 | 02 | 08 | 2006 | 9:14 | SCRW060208 | 32.93084 | 79.24516 | B | 3442 | 0.40 |
| 26 | 02 | 15 | 2006 | 10:20 | SCRW060215 | 33.06550 | 79.07350 | A | | 0.13 |
| 27 | 02 | 15 | 2006 | 10:20 | SCRW060215 | 33.06550 | 79.07350 | B | | 0.13 |
| 28 | 02 | 17 | 2006 | 12:10 | SCRW060217 | 31.95750 | 80.47450 | A | 1968 | 1.59 |
| 29 | 02 | 17 | 2006 | 14:00 | SCRW060217 | 31.61300 | 80.95417 | B | 1946 | 0.97 |
| 30 | 02 | 17 | 2006 | 14:00 | SCRW060217 | 31.61300 | 80.95417 | C | CALF | 0.97 |
| 31 | 02 | 25 | 2006 | 11:19 | SCRW060225 | 32.29250 | 79.74050 | A | | 0.94 |
| 32 | 02 | 25 | 2006 | 11:19 | SCRW060225 | 32.29250 | 79.74050 | B | 2048 | 0.94 |
| 33 | 02 | 25 | 2006 | 11:19 | SCRW060225 | 32.29250 | 79.74050 | B | 3103 | 0.94 |
| 34 | 03 | 03 | 2006 | 13:55 | SCRW060303 | 32.02650 | 80.64500 | A | 2420 | 0.71 |
| 35 | 03 | 03 | 2006 | 13:55 | SCRW060303 | 32.02650 | 80.64500 | B | CALF | 0.71 |
| 36 | 03 | 04 | 2006 | 14:35 | SCRW060304 | 33.05767 | 78.58717 | A | | n/a |
| 37 | 03 | 05 | 2006 | 8:44 | SCRW060305 | 32.34617 | 80.22533 | n/a | no photos | n/a |
| 38 | 03 | 05 | 2006 | 11:49 | SCRW060305 | 31.86767 | 80.43501 | A | | n/a |
| 39 | 03 | 05 | 2006 | 11:49 | SCRW060305 | 31.86767 | 80.43501 | B | 3103 | n/a |
| 40 | 03 | 05 | 2006 | 11:49 | SCRW060305 | 31.86767 | 80.43501 | C | | n/a |
| 41 | 03 | 05 | 2006 | 11:51 | SCRW060305 | 31.87450 | 80.43501 | D | 1968 | n/a |
| 42 | 03 | 05 | 2006 | 11:51 | SCRW060305 | 31.87450 | 80.43501 | E | 2753 | n/a |
| 43 | 03 | 05 | 2006 | 11:51 | SCRW060305 | 31.87450 | 80.43501 | F | | n/a |
| 44 | 03 | 05 | 2006 | 13:40 | SCRW060305 | 31.86333 | 80.44650 | G | 2753 | n/a |
| 45 | 03 | 05 | 2006 | 13:40 | SCRW060305 | 31.86333 | 80.44650 | H | | n/a |
| 46 | 03 | 05 | 2006 | 13:40 | SCRW060305 | 31.86333 | 80.44650 | I | 2048 | n/a |
| 47 | 03 | 05 | 2006 | 13:40 | SCRW060305 | 31.86333 | 80.44650 | J | | n/a |
| 48 | 03 | 05 | 2006 | 13:40 | SCRW060305 | 31.86333 | 80.44650 | K | | n/a |
| 49 | 03 | 05 | 2006 | 13:49 | SCRW060305 | 31.85833 | 80.43066 | L | | n/a |
| 50 | 03 | 05 | 2006 | 13:49 | SCRW060305 | 31.85833 | 80.43066 | M | 3103 | n/a |
| 51 | 03 | 05 | 2006 | 13:49 | SCRW060305 | 31.85833 | 80.43066 | N | 2810 | n/a |
| 52 | 03 | 05 | 2006 | 14:16 | SCRW060305 | 31.90917 | 80.42467 | O | 1968 | n/a |

| Sighting # | Month | Day | Year | Time (L) | Survey Name | DecLat | DecLong | RIWH Letter | EGNO | Sight Dist (nm) |
|------------|-------|-----|------|----------|-------------|----------|----------|-------------|------|-----------------|
| 53 | 03 | 11 | 2006 | 9:32 | SCRW060311 | 31.82917 | 80.87783 | A | 2791 | n/a |
| 54 | 03 | 11 | 2006 | 9:32 | SCRW060311 | 31.82917 | 80.87783 | B | CALF | n/a |
| 55 | 03 | 11 | 2006 | 11:39 | SCRW060311 | 31.84583 | 80.87317 | A | 2791 | 0.94 |
| 56 | 03 | 11 | 2006 | 11:39 | SCRW060311 | 31.84583 | 80.87317 | B | CALF | 0.94 |
| 57 | 03 | 12 | 2006 | 13:13 | SCRW060312 | 32.38966 | 79.83866 | A | 1719 | 1.01 |
| 58 | 03 | 12 | 2006 | 13:13 | SCRW060312 | 32.38966 | 79.83866 | B | 2018 | 1.01 |
| 59 | 03 | 12 | 2006 | 13:13 | SCRW060312 | 32.38966 | 79.83866 | C | | 1.01 |
| 60 | 03 | 12 | 2006 | 13:13 | SCRW060312 | 32.38966 | 79.83866 | G | 2740 | 1.01 |
| 61 | 03 | 12 | 2006 | 13:17 | SCRW060312 | 32.39167 | 79.84200 | D | | 0.87 |
| 62 | 03 | 12 | 2006 | 13:17 | SCRW060312 | 32.39167 | 79.84200 | E | | 0.87 |
| 63 | 03 | 12 | 2006 | 13:17 | SCRW060312 | 32.39167 | 79.84200 | F | 1327 | 0.87 |
| 64 | 03 | 12 | 2006 | 13:17 | SCRW060312 | 32.39167 | 79.84200 | K | | 0.87 |
| 65 | 03 | 12 | 2006 | 13:41 | SCRW060312 | 32.40367 | 79.88667 | H | | 0.27 |
| 66 | 03 | 12 | 2006 | 14:56 | SCRW060312 | 32.41583 | 80.23083 | I | 1611 | 0.05 |
| 67 | 03 | 12 | 2006 | 14:56 | SCRW060312 | 32.41583 | 80.23083 | J | CALF | 0.05 |
| 68 | 03 | 13 | 2006 | 15:50 | SCRW060313 | 32.57050 | 79.63516 | A | | 0.48 |
| 69 | 03 | 13 | 2006 | 16:04 | SCRW060313 | 32.63667 | 79.69334 | B | 2123 | 0.29 |
| 70 | 03 | 13 | 2006 | 16:04 | SCRW060313 | 32.63667 | 79.69334 | C | CALF | 0.29 |
| 71 | 03 | 13 | 2006 | 16:20 | SCRW060313 | 32.66683 | 79.73383 | D | 2029 | 0.49 |
| 72 | 03 | 13 | 2006 | 16:20 | SCRW060313 | 32.66683 | 79.73383 | E | CALF | 0.49 |
| 73 | 03 | 13 | 2006 | 16:49 | SCRW060313 | 32.60733 | 79.78899 | F | 2018 | 0.48 |
| 74 | 03 | 13 | 2006 | 16:49 | SCRW060313 | 32.60733 | 79.78899 | G | | 0.48 |
| 75 | 03 | 13 | 2006 | 16:49 | SCRW060313 | 32.60733 | 79.78899 | H | | 0.48 |
| 76 | 03 | 13 | 2006 | 16:49 | SCRW060313 | 32.60733 | 79.78899 | I | | 0.48 |
| 77 | 03 | 13 | 2006 | 16:49 | SCRW060313 | 32.60733 | 79.78899 | K | | 0.48 |
| 78 | 03 | 13 | 2006 | 16:58 | SCRW060313 | 32.60900 | 79.78650 | J | | 0.38 |
| 79 | 03 | 20 | 2006 | 10:17 | SCRW060320 | 32.89983 | 79.14217 | A | | 0.51 |
| 80 | 03 | 20 | 2006 | 10:36 | SCRW060320 | 32.91066 | 79.11183 | B | | 0.14 |
| 81 | 03 | 20 | 2006 | 10:39 | SCRW060320 | 32.91883 | 79.10783 | C | 1327 | 0.60 |
| 82 | 03 | 20 | 2006 | 10:39 | SCRW060320 | 32.91883 | 79.10783 | D | | 0.60 |
| 83 | 03 | 20 | 2006 | 10:39 | SCRW060320 | 32.91883 | 79.10783 | E | 1428 | 0.60 |
| 84 | 03 | 20 | 2006 | 10:39 | SCRW060320 | 32.91883 | 79.10783 | F | 1719 | 0.60 |
| 85 | 03 | 25 | 2006 | 16:58 | SCRW060325 | 32.46850 | 79.63084 | A | 1716 | 0.17 |

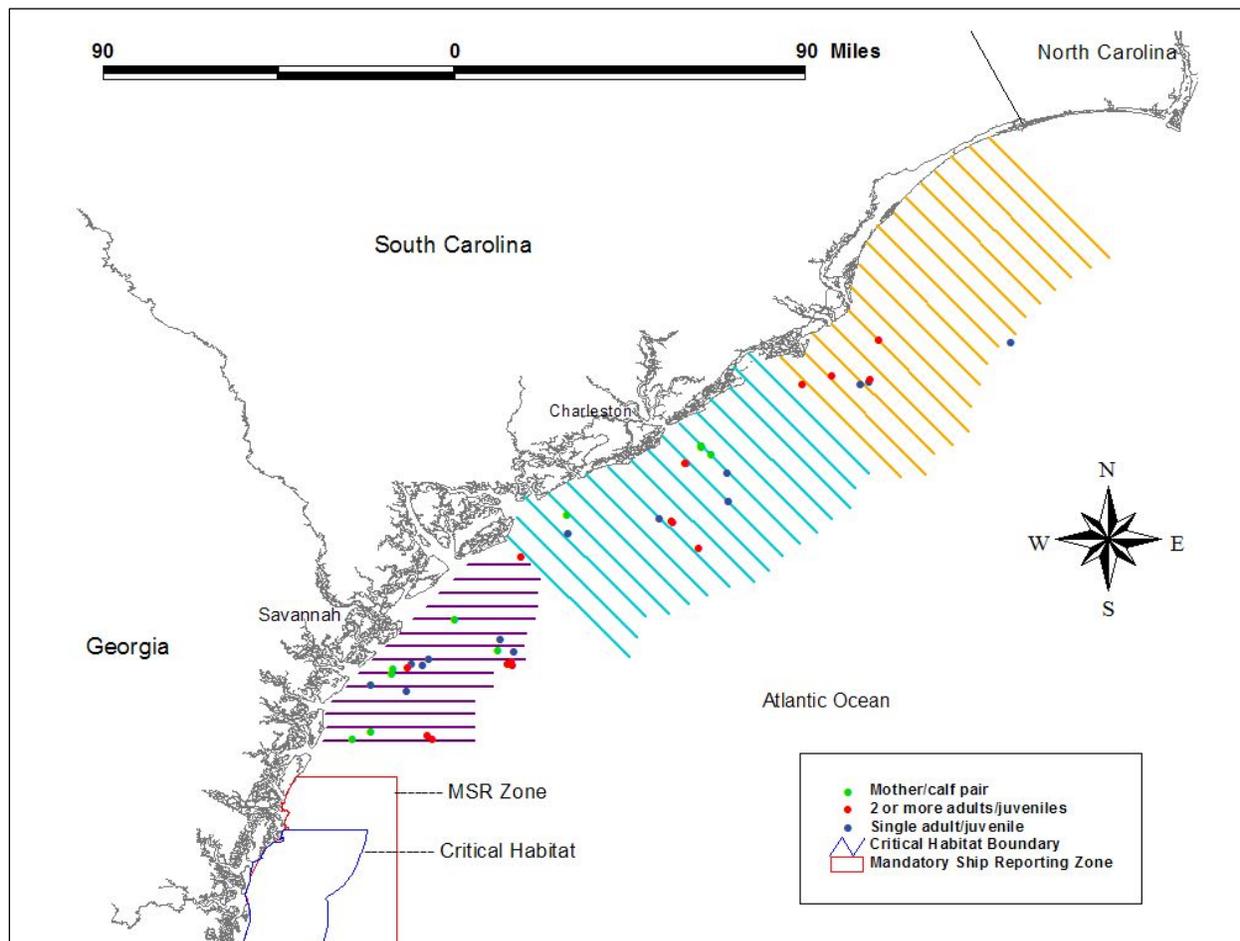


Figure 3: Right whale sightings documented during the 2005-2006 SCRW right whale aerial surveys.

Sightings of note in the SCRW study area include EGNOs 1327, 1428, 1716, 1719, 2018, SE06BK03, SE06BK08, and SE06CT05. These animals were sighted only by the SCRW team during the 2005-2006 calving season. At the time of this report, there are also 15 individuals that are as of yet unidentified, that have not been sighted elsewhere in the SEUS (Table 4). Seventy-two percent of all sightings occurred during February and March 2006 (Figure 4.). This is almost a reversal of the sightings of the 2004/2005 SCRW survey season where 88 % of all sightings occurred during December 2004 and January 2005. Nine more surveys were flown in December 2004 and January 2005 than in December 2005 and January 2006 which may account for the difference in sighting numbers between the two seasons. However, there were only three more surveys flown in February and March 2006 than in February and March 2005. The latest sighting occurred on 25 March 2006, despite 59 hours of survey time flown after that date.

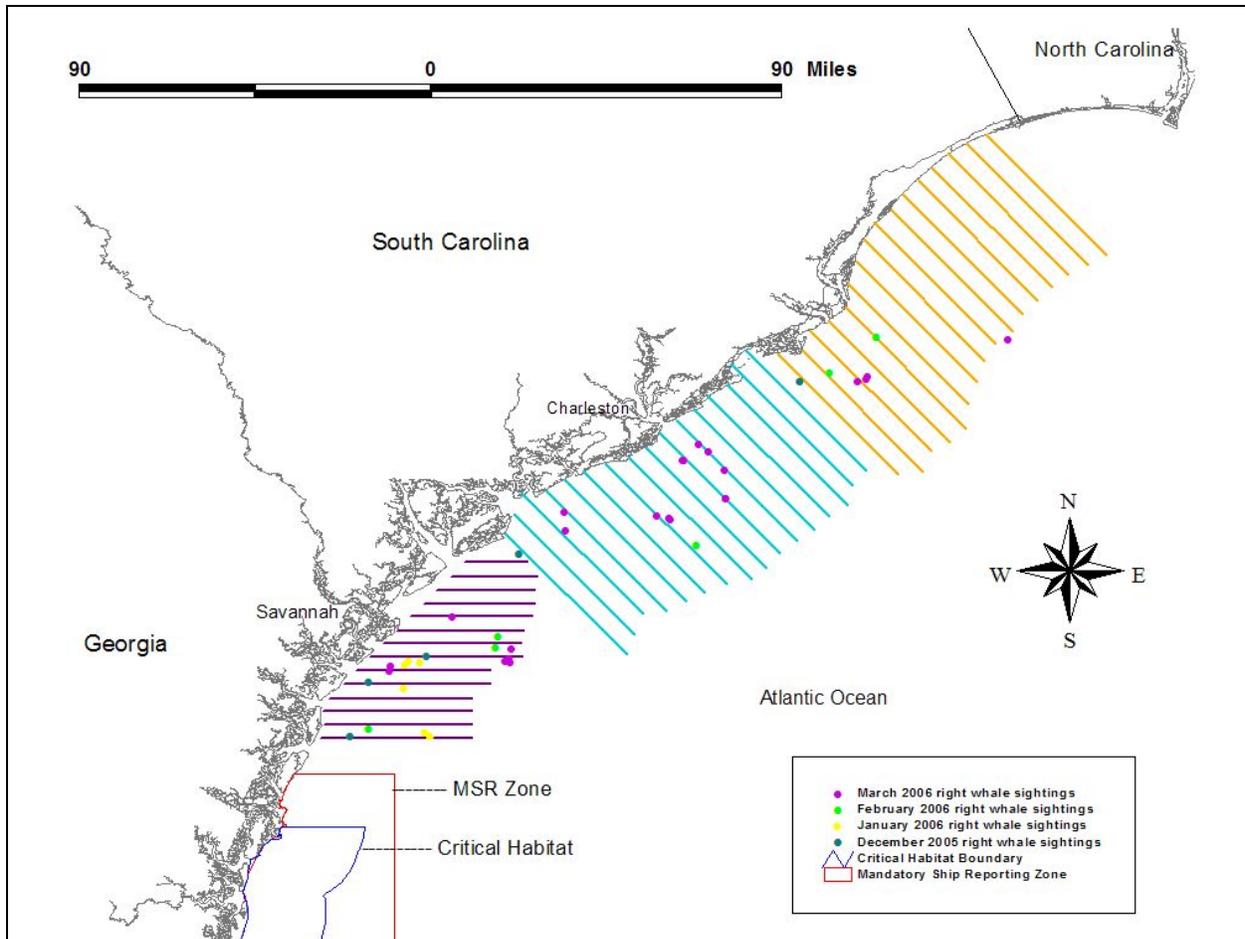


Figure 4: Right whale sightings by month in the SCRW study area 24 November 2005 – 15 April 2006.

Table 4: Individuals sighted within the 2005-2006 SCRW survey area, including age, gender, reproductive status (if known) and unique individuals. This table includes preliminary information provided by the New England Aquarium. Data will not be considered final until verifications are provided by the New England Aquarium.

| ID | Unique to SCRW | Age | Sex | last calving | # calves (incl 0506) | Notes |
|-----------|----------------|-----|-----|--------------|----------------------|-------|
| 1151 | | U | F | 2003 | 5 | |
| 1281 | | U | F | 2004 | 6 | |
| 1327 | Y | U | M | | | |
| 1428 | Y | U | M | | | |
| 1611/CALF | | 20 | F | 2001 | 2 | |
| 1716 | Y | 19 | M | | | |
| 1719 | Y | U | F | | | |
| 1802/CALF | | 18 | F | 2003 | 2 | |
| 1946/CALF | | 17 | F | 2003 | 3 | |
| 1968 | | 17 | F | | | |
| 2018 | Y | 16 | M | | | |
| 2048 | | 16 | M | | | |

| ID | Unique to SCRW | Age | Sex | last calving | # calves (incl 0506) | Notes |
|-----------|----------------|-----|-----|--------------|----------------------|------------------|
| 2029/CALF | | 16 | F | 2003 | 2 | |
| 2123/CALF | | 15 | F | 2003 | 2 | |
| 2420/CALF | | U | F | 2002 | 3 | |
| 2660 | | 10 | F | | 1 | |
| 2710 | | 9 | F | | 1 | |
| 2740 | | 9 | M | | | |
| 2753 | | 9 | F | | | |
| 2791/CALF | | U | F | | 1 | |
| 2810 | | 8 | M | | | |
| 3103 | | 5 | F | | | |
| 3260 | | U | F | | | |
| 3346 | | 3 | M | | | |
| 3442 | | 2 | U | | | |
| 060208 A | Y | | | | | |
| 060215 A | | | | | | |
| 060215 B | Y | | | | | |
| 060225 A | | | | | | |
| 060304 A | Y | | | | | |
| 060305 A | | | | | | |
| 060305 C | | | | | | Not identifiable |
| 060305 F | | | | | | Not identifiable |
| 060305 H | Y | | | | | |
| 060305 J | | | | | | Not identifiable |
| 060305 K | | | | | | |
| 060305 L | Y | | | | | |
| 060312 C | Y | | | | | |
| 060312 D | Y | | | | | |
| 060312 E | | | | | | |
| 060312 H | | | | | | |
| 060312 K | Y | | | | | |
| 060313 A | Y | | | | | |
| 060313 H | Y | | | | | |
| 060313 I | Y | | | | | |
| 060313 J | | | | | | Not identifiable |
| 060313 K | Y | | | | | |
| 060320 A | Y | | | | | |
| 060320 B | Y | | | | | |
| 060320 D | Y | | | | | |
| SE06BK01 | | | | | | |
| SE06BK03 | Y | | | | | |
| SE06BK04 | | | | | | |
| SE06BK05 | | | | | | |
| SE06BK06 | | | | | | |
| SE06BK08 | Y | | | | | |
| SE06CT01 | | | | | | |
| SE06CT02 | | | | | | |

| ID | Unique to SCRW | Age | Sex | last calving | # calves (incl 0506) | Notes |
|----------|----------------|-----|-----|--------------|----------------------|-------|
| SE06CT05 | Y | | | | | |

Fourteen individual whales (including two calves) were sighted more than once in the SCRW survey area (Table 5.). Of these, EGNOs 1327, 1719, and SE06BK03 are unique to the SCRW survey area and were only seen in the middle and northern survey areas, suggesting a residency off South Carolina. The longest period of occupancy based on sighting information is sixteen days, for EGNO 1968.

Table 5: Right whales resighted within the 2005/2006 SCRW survey area.

| ID | Date/Area first sighted | Date/Area last sighted |
|-----------|-------------------------|------------------------|
| 1151 | 01/04/06 - South | 01/08/06 - South |
| 1281 | 01/04/06 - South | 01/04/06 - South* |
| 1327 | 03/12/06 - Middle | 03/20/06 - North |
| 1719 | 03/12/06 - Middle | 03/20/06 - North |
| 1946/CALF | 02/06/06 - South | 02/17/06 - South |
| 1968 | 02/17/06 - South | 03/05/06 - South** |
| 2018 | 03/12/06 - Middle | 03/13/06 - Middle |
| 2791/CALF | 03/11/06 - South | 03/11/06 - South* |
| 3103 | 02/25/06 - Middle | 03/05/06 - South** |
| 060312 E | 03/12/06 - Middle | 03/13/06 - Middle |
| SE06BK03 | 12/01/05 - Middle | 12/03/05 - North |
| SE06BK04 | 12/01/05 - Middle | 12/03/05 - North |

* - resighted in afternoon

** - sighted twice on 03/05/06

According to the New England Aquarium, as of May 2006, a total of 71 individual right whales (including 19 cow/calf pairs) have been identified in the Southeast US, though photo-analysis is still pending and this is a minimum estimate of individuals. It is important to note that at least 10 of the mothers observed during the 2005/2006 season last gave birth 3 years ago, in 2003. One mother last gave birth 2 years ago, in 2004.

Sighting Distances for Right Whales

Sighting distances were calculated whenever possible, and the average sighting distance for all right whale sightings was 0.93 nm (SD=0.69).

Sighting Distances for Large Vessels

Sighting angles were obtained for large commercial and military ships whenever possible, and used to calculate distance from the trackline. Average distance from the trackline for large vessels with documented sighting angles was 2961.95 m (SD=4168.54).

Whale/Ship Interactions

There were two “close-call” whale/ship interactions observed within the SCRW study area. On 04 January 2006, a private fishing vessel was transiting an area roughly 0.75 nm south of two single adult whales at an estimated speed of 25 kts. A position of the vessel was taken at 1243 hrs at 31°51.1N 080°48.5W. One whale, EGNO 1281, was at 31°51.6N 081°45.9W at 1248. The other animal, a juvenile, was at 31°51.8N 080°48.2W at 1238. By the time the plane contacted the vessel it had stopped to fish approximately 0.75 nm south of the whales. The team informed the vessel of the whales’ presence and requested that they remain 500 yards away. The vessel reported that they were going to remain at their current position.

On 17 February 2006, an LNG tanker, the Tenaga Satu, was departing the Charleston shipping channel, traveling east. The team sighted a right whale, EGNO 1968, less than a mile to the northeast of the vessel, traveling south. An initial position of the whale was taken at 1210 hrs at 31°57.45N 080°28.47W. The animal dove at this position. An initial position of the vessel was taken at 1212 at 31°57.54N 080°28.73W. The team took another position of the vessel when it was visually estimated to be at the same coordinates as the whale beneath the surface. This was 31°57.29N 080°28.15W at 1215. The team circled over both the whale and the vessel and hailed the vessel by name on Marine channel 16 five separate times. The vessel never responded. The team verified that the radio was working by hailing Coast Guard Station Tybee Island. Both Coast Guard Station Tybee Island and Coast Guard Station Charleston responded and confirmed that we were broadcasting. The animal surfaced at 1217 approximately 0.3 nm WSW of the vessel. The team circled and ascertained that there were no visible injuries and discontinued hailing the vessel. The team took a final position of the whale at 1220 at 31°56.97N 080°28.52W. The vessel never altered its course or speed during the encounter. The animal was traveling south with dolphins when it was first sighted. The whale breached once as the team started circling, then dove. The dolphins departed after the whale’s dive. When the whale resurfaced, it continued traveling south at moderate speed. Due to the fact that the animal was initially sighted while in close proximity to the vessel, the team could not comment on whether the animal’s behavior changed due to the interaction. Figure 5 depicts this whale/ship interaction using the data provided by the SCRW team and the AIS data collected by the NEA survey team, including the speed with which the vessel was traveling.

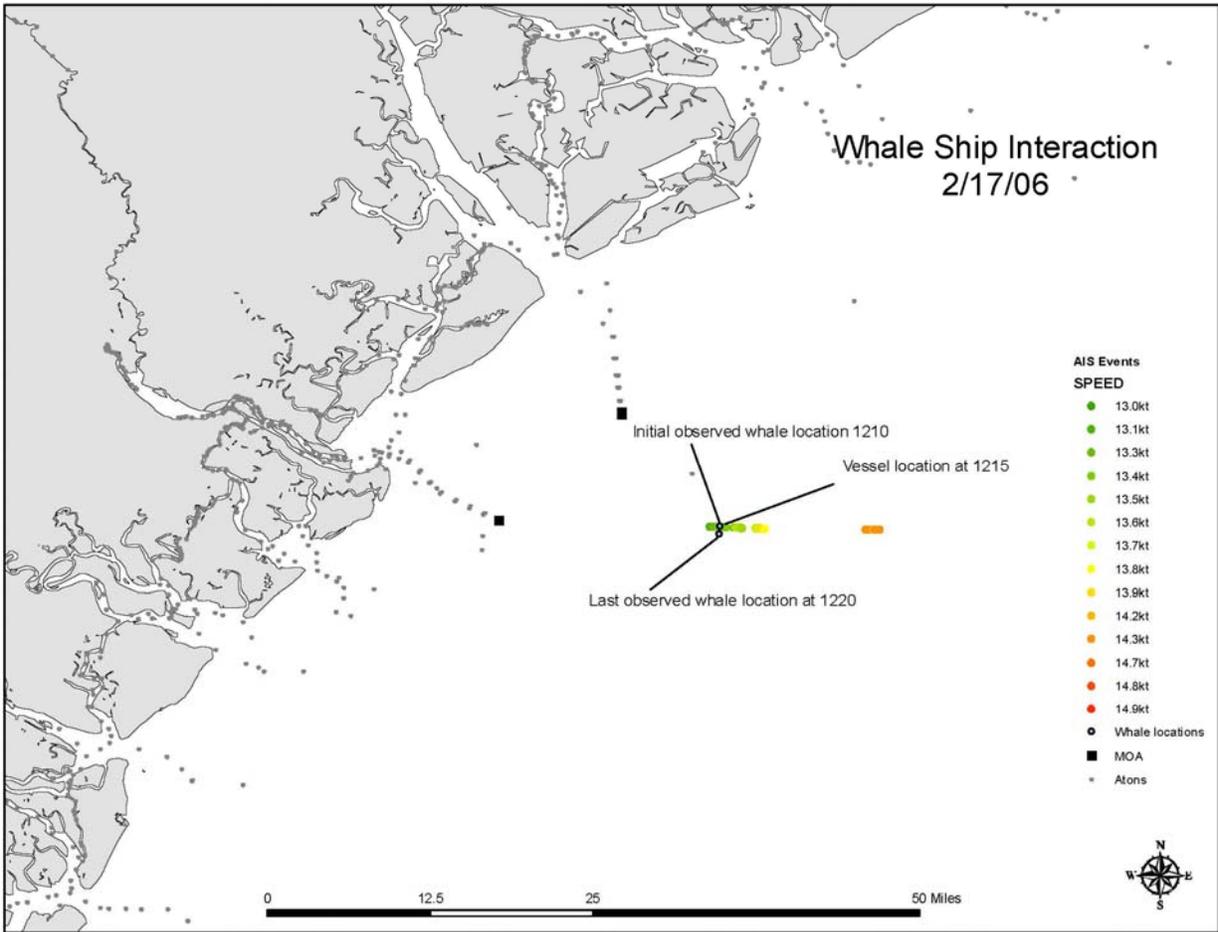


Figure 5: Whale/Ship interaction on 17 February 2006 between an LNG Tanker and a single adult right whale.

Discussion and Recommendations

The calving ground of the Southeast United States is extremely important to the reproducing population of the North Atlantic right whale. In addition, this area is vital to military and commercial interests. Three major shipping routes cross through the designated critical habitat, and provide a constant threat to the slow-moving right whale, particularly the females and calves. Three additional shipping routes are located to the north and south of the critical habitat boundary. The Early Warning System and associated aerial surveys, communication system, and other components have greatly improved the odds of preventing or lessening the risk of ship strikes to whales while in this critical habitat.

Further north of this region, along the mid-Atlantic coast, the same threats exist. However, very little is known about right whale distribution outside the traditional survey areas. By expanding the survey areas to the north, more reliable information regarding right whale distribution and habitat use is becoming available, providing more protection to the right whale. The coast of

South Carolina has been surveyed sporadically in the past, but by providing consistent survey effort throughout the migration and calving season valuable additional sightings and warnings to mariners have been made available. In comparison to the EWS survey areas the number of sightings in the SCRW area this season (40) was low, however the numbers were much higher than expected in a region that is traditionally not considered a residency area for right whales.

With the discussion of re-evaluating the boundary of the current critical habitat, the South Carolina surveys will play an important role in designating the most appropriate northern boundary for this critical management designation. In order to increase the sample size available for sighting analyses and provide a sufficient overview of the use of the area by the right whale population we recommend that surveys be continued through at least one more calving season. Ideally the surveys will begin on 15 November next season in order to catch the early southward migration of the whales into the area. Surveys should also continue through at least 15 April to document the residency time and migration routes of whales returning north.

This study is also serving as an aid to research being conducted by NOAA Fisheries to test passive acoustic monitoring devices. Our survey data will be available to ground truth right whale calls collected remotely. We will provide all data for comparison with acoustic data when it becomes available.

Large areas of the US east coast are without consistent survey effort, limiting data and protection available for the right whale. However, limitations of these aerial survey efforts must also be addressed, as evidenced by the mortality of a right whale calf within the calving ground this season (Moore 2006) and the lack of response from the large vessel encountered off the Charleston channel (see above). If the 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 and documenting right whales. We highly recommend continuing SCRW surveys from 15 November 2006 through 15 April 2007.

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