

June 1, 2004

Cruise Results
NOAA Fisheries Research Vessel Albatross IV
Cruise No. Albatross IV 04-04
Northern Right Whale Survey

Cruise Period and Area

The survey was conducted aboard the NOAA R/V Albatross IV from 26 April to 21 May, 2004. It started and returned in Woods Hole, Ma. The southern border of the study area included Great South Channel, which is also the southern most portion of the Great South Channel Right Whale Critical Habitat area. The northern border included the waters surrounding the northeast portion of Cape Cod, (Provincetown, Ma.) and northern most portion of the Great South Channel (GSL).

Objectives

The primary objectives of the cruise were to conduct marine mammal observations from the near-shore waters of Cape Cod to throughout the Great South Channel Right Whale Critical Habitat area. Specific goals include: (1) photographing and biopsy sampling of large cetaceans (North Atlantic Right whales, Sei and Humpback whales) for individual identification; (2) running transect lines to determine cetacean distribution; (3) Attached time-depth-recorder (TDR) tags on right whales; (4) provide support for the Right Whale Sighting Advisory System (SAS); (5) conduct oceanographic CTD/OPC stations throughout the GSC Right Whale Critical Habitat area; and (6) deploy and retrieve acoustic pop-up buoys in the GSL.

Methods

Survey Methods

The marine mammal survey, aboard the Albatross IV was conducted at a speed of 10 knots. Survey operations were conducted during daylight hours (0700-1700) and sometimes later (til 19:30) if weather conditions permitted. The survey was conducted along pre-determined track lines with oceanographic stations every 5 miles (Figure 1)

During survey operations scientific personnel formed a single sighting team of either two or three observers. Two individuals searching from the bridge deck observing from the bow to amidships on either side using 10X50 binoculars. The third member of the team would be positioned in the middle and would act as data recorder as well as scanning using naked eye and hand-held binoculars. When on watch, all observer positions rotated every 30 minutes.

When large concentration of whales were sighted which were too far away for proper identification, the Albatross IV, would break track to facilitate species identification, slowed its speed to conduct photo-identification of individuals and to better ascertain the actual total

number of whales in an area. Upon request of the Chief Scientist, a rigid-bottom inflatable boat (RHIB) was deployed with three or four members aboard for photo identification and collection of biopsy samples. The decision concerning deployment would depend upon weather conditions and by the number, species, and movements of the encountered whales. Photo identification and biopsy sampling was conducted on the following species: right whales, humpback and sei whales.

During this 25 day cruise, the Albatross IV transected regions of the Gulf of Maine where North Atlantic right whales had been reported recently, historically, or in present time locations with the assistance of aerial survey platforms in the region. Weather (Beaufort <3) and daylight conditions were the only limiting factors for the vessel to conduct small boat operations which coincided with sightings of right whales.

Photographic and biopsy sampling methods

Photographs were taken with a digital 35 mm camera equipped with an auto focus zoom or telephoto lens and power winder. Individual identity was documented using the following natural or acquired characteristics: dorsal fin shape and scarring (sei whales), callosity pattern and scarring (right whales), dorsal fin and ventral side of the fluke (humpback whale).

Skin biopsies were taken with a 70-kg-draw crossbow and a specially designed sampling dart (See Palsboll et al. 1991). Each biopsy sample was divided three ways: (i) 1/3 frozen archived at the NEFSC; (ii) part of the dermis and epidermis into DMSO for genetics; and (iii) remaining skin frozen for stable isotope analysis.

During biopsy operations, the Albatross IV would assist with visually monitoring of the whales, from the bridge deck. The Albatross IV was also requested to approach large whale species for photographic individual identification (i.e. without launching a RHIB).

Additional methods for data collected

The position (latitude/longitude), date, time, speed, course, sea surface temperature, water depth and other variables were obtained from the ship computer system (SCS), which will be interfaced with two portable computers. These data were routinely collected every minute during survey operations.

Sightings and effort data were recorded using a hand-held at-sea data entry system "pingle". All marine mammal sightings included; event number, observers name, date, time, species, best, high, low count for number of animals, bearing to the ship, animals swim direction, presence or absence of calves in group, distance from Albatross IV, animal's behavior, cue to sighting the animal, any additional comments.

All effort data included; date, time, event, platform, staff at position, magnification used for observations, cloud cover, weather, sun and glare (vertical and horizontal angle of the sun, angle/location to ship, glare width and intensity), transect number, Beaufort, visibility, sea state

(swell height and angle to the ship).

Daily, all observers reviewed and edited effort and sightings data. Copies of the original and edited versions are maintained by the NEFSC.

Northern right whales: When northern right whales are encountered, and if the scientific party is unavailable, bridge officers were requested to observe and collect data per the protocols described in the NEFSC Sighting Network Manual, dated 9 October 1997.

Data Management: Sightings and oceanographic data will be processed and computerized at the NEFSC Laboratory at Woods Hole, Massachusetts. Biopsy and tissue samples will be archived at the NEFSC until the appropriate processing organization is identified. Tissue collection and distribution will be conducted under authority of MMPA and ESA Research Permits 775-1600-8 (mammals) and 1295 (turtles).

ROSCOP 3 forms (IOC SC-90/WS-23) will be completed and forwarded to NODC, Washington, DC. A cruise report, and a completed "Ship Operations Evaluation Form," will be submitted to the NEFSC Vessel Coordinator within 20 days following the completion of the cruise.

Results

Area covered

The study area was the Great South Channel, which includes the Great South Channel Right Whale Critical Habitat area. During the 25 days, 4 days were tied to the Woods Hole dock due to weather or mechanical problems. Figure 2 (gray area) was surveyed extensively during the remaining 21 days.

Right Whale Sightings

All Right whale sightings were reported to the Right Whale Sighting Advisory System (SAS). Daily SAS reports were submitted via email and cell phone. This cruise generated 16 SAS reports. Right whales were sighted from the Albatross IV; April 28th, 29th, 30th; May 1st, 2nd, 4th, 5th, 7th, 11th, 12th, 13th, 16th, 17th, 18th, 19th, 20th. Total number of right whales sighted was 226. The best number of individuals photographed will be determined at some later date after photo-analysis is completed.

Efforts to locate/relocate Entangled Right Whale #3120

The Albatross IV provided additional effort to relocate an entangled right whale (#3120) on two occasions (May 19th and May 20th). However, due to darkness and fog, no effort was made to attach a satellite tag or disentangle the animal.

Biopsy sampling and protocol

Three sei whale and two humpback biopsies were collected during this cruise. All right whales were photographed for individual identification purposes. Pre and post biopsy behavior was collected on all biopsy attempts. No reaction was documented during the seven attempts, five hits, five samples collected on the targeted whales. The final disposition of samples is as follow: all biopsy samples were divided into three parts for 1) genetics 2) Stable isotopes, and 3) archive sample to be maintained by the Protected Species Branch at the NEFSC.

CTD/OPC

Oceanographic sampling were conducted during daylight hours and included: (1) CTD casts along track lines and elsewhere; (2) plankton tows using Mocness and (3) OPC (Optimum Plankton Counter). Sampling was conducted at predetermined stations, and in areas with whale concentrations and in the vicinity of tagged right whales. Environmental and oceanographic parameters were routinely collected (daily) using the vessel's Scientific Computer System (SCS). Position, date, time, speed, course, temperature, depth and other variables will be obtained from the ship computer system (SCS), which will be interfaced with two portable computers.

Oceanographic sampling stations were conducted along pre-determined track lines. These stations were 5 miles apart. A total of 112 CTD/OPC stations were sampled in the Great South Channel Right Whale Critical Habitat area.

Right whales and TDR (Time Depth Recorders)

Five right whales were approached and tagged with a TDR suction cup tag during this cruise. The goal was to tag right whales in the GSC and to gather time/depth and associated feeding behavior, along with surface body temperature during these tagging operations.

Time-depth recorders were deployed from the bow of the 5.5 m rigid hull inflatable boat (RHIB) using a telescoping pole. Identification photographs of the tagged whales will be collected opportunistically in such a way as not to disturb the whales. The TDR tag consists of a Wildlife Computers MK9 Recorder, an instrument to measure physiological parameters, a radio transmitter, an acoustic transmitter and a foam floatation. To this tag is attached a silicone or rubber suction cup, a Telonics VHF radio transmitter (model CHP-1P), a light-emitting diode (LED) beacon and syntactic foam floatation. After deployment, the tag whale is tracked via an acoustic receiver aboard the RHIB, VHF radio receivers aboard the *Albatross IV* and the RHIB, and visually tracked by hand-held 7x50 binoculars and the naked eye. After the tag is attached, the time and position of the initial resurfacing after each long dive is recorded. The exact resurfacing position is obtained by parking the RHIB on the whale's footprint, but occasionally this position will be roughly estimated from the *Albatross IV*'s position, using a magnetic bearing and a distance estimate. The *Albatross IV* will move into position after each resurfacing location and a vertical cast with the CTD/OPC instrument package was made. After TDR detachment from the whale, the tag is recovered by the RHIB with the aid of the VHF radio signal.

Deployment and Retrieval of Acoustic Pop-up buoys

On May 12th and May 13th, the *Albatross IV* deployed five Cornell University Acoustic pop-up (PU) buoys in the Great South Channel. The buoys were successfully retrieved on May 17, 2004. The buoys were deployed and retrieved at the positions below.

PU#5, Loc #1, 41 21.36N/69 18.12W
PU#61, Loc #2, 41 17.40N/69 14.71W
PU#64, Loc #3, 41 21.17N/69 11.51W
PU#54, Loc #4, 41 17.46N/69 07.97W
PU#43, Loc #5, 41 21.16N/69 04.89W

Analysis is presently underway at Cornell University, Ithaca, NY to determine the success of these acoustic receivers.

Other cetaceans sightings

Table 1. Sightings of cetaceans from *Albatross IV* AL04-04, 26 April to 21 May 2004. "Number" represents the sum of best estimates for each sighting during the entire cruise. Number photo-identified is preliminary and will be updated when photo analysis is complete.

Species	Number	Photo-ID'd	Biopsied
<i>Eubalaena glacialis</i>	226	5+	-
<i>Megaptera novaeangliae</i>	56	5+	2
<i>Balaenoptera physalus</i>	18	-	-
<i>Balaenoptera borealis</i>	128	6+	3
<i>Balaenoptera acutorostrata</i>	7	-	-
<i>Lagenorhynchus acutus</i>	267	-	-
<i>Phocoena phocoena</i>	-	-	-
Fin/sei undetermined	3	-	-
Unidentified dolphin	21	-	-
<u>Unidentified large whales</u>	<u>48</u>	<u>-</u>	<u>-</u>
TOTAL	814	16	5

Disposition of the photographic data

All right whales photographed during the cruise will be submitted to the Right Whale Catalogue maintained at New England Aquarium, Boston, Massachusetts.

PERSONNEL (SCIENTIFIC)

26 April - 21 May 2004

<u>Name</u>	<u>Title</u>	<u>Institution</u>
1. Frederick Wenzel	Chief Scientist	NMFS, NEFSC, Woods Hole, MA
2. John Nicolas	Marine Mammal Spec.	NMFS, NEFSC, Woods Hole, MA
3. Marjorie Rossman	Statistician	NMFS, NEFSC, Woods Hole, MA
4. Mark Baumgarter	Post-Doc	WHOI, Woods Hole, MA
5. Ingrid Biedron	Student	Cornell Univ., Ithaca, NY
6. Danielle Cholewiak	Student	Cornell Univ., Ithaca, NY
7. Nadine Lysiak	Student/Contractor	BUMP, Woods Hole, MA
8. Chris Tremblay	Contractor	COA, Bar Harbor, Maine

References

Palsboll, P.J., F. Larsen and E.S. Hansen. 1991. Sampling of skin biopsies from free ranging large cetaceans in West Greenland: Development of new biopsy tips and bolt designs. In International Whaling Commission Special Issue 13 SC/S89/Gen26 pp. 71-79.

Acknowledgment

A special thank you to the officers and crew of the Albatross IV for making this right whale research cruise such a success.

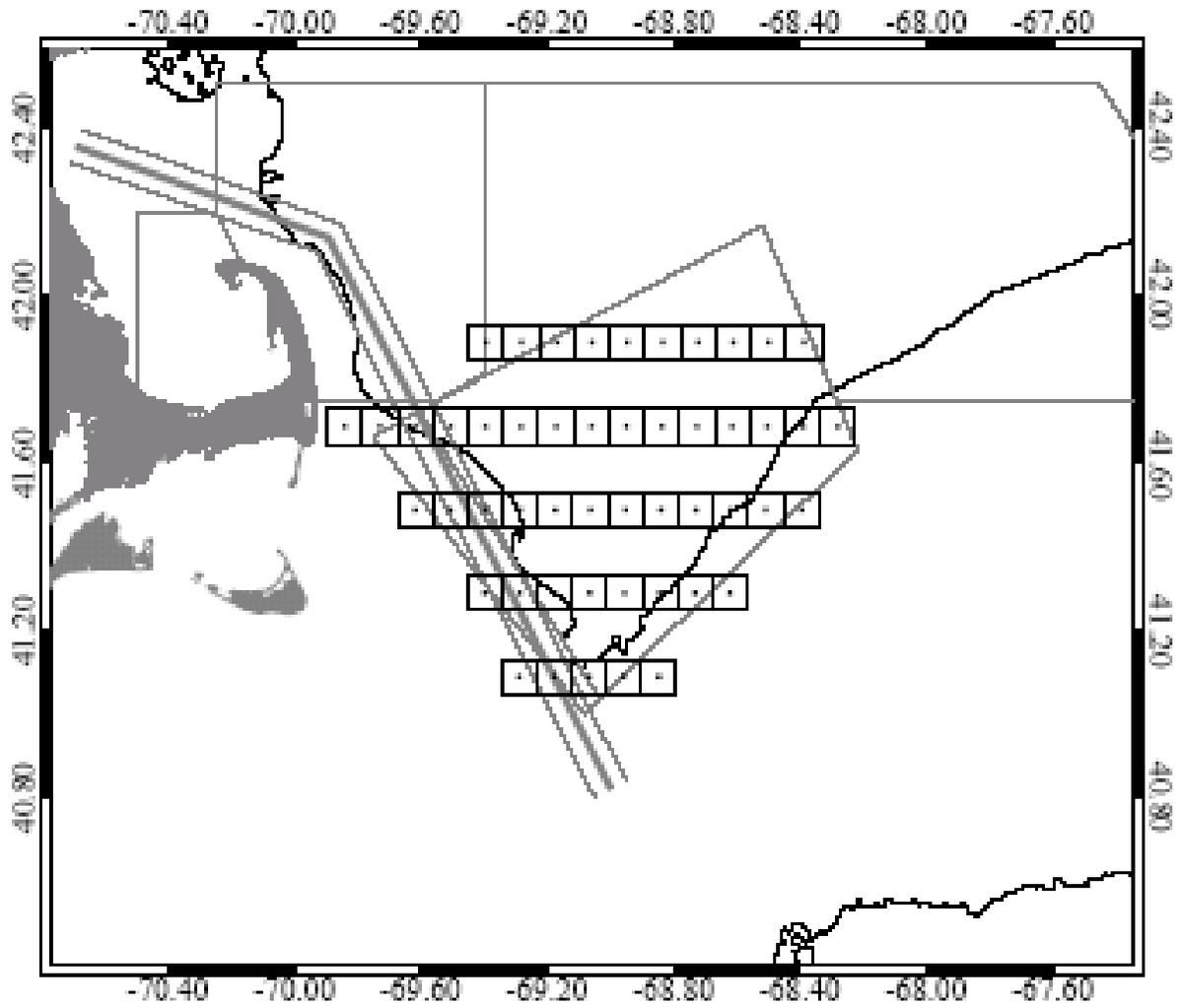


Figure 1. Great South Channel survey area and CTD/OPC sampling stations.

Figure 2. Grey shaded area is the Great South Channel Right Whale Critical Habitat area.

