

Bahamas Marine Mammal Survey
2004 FIELD REPORT to
Bahamas Department of Fisheries
Permit # MAF/FIS/12^A

PRELIMINARY RESULTS

Background

The Bahamas Marine Mammal Survey (BMMS) is a long-term study that has been documenting the occurrence, distribution, and abundance of marine mammals around the islands of The Bahamas since 1991. With more than 1700 marine mammal encounters in The Bahamas, we are providing the only comprehensive documentation of the marine mammal fauna in this part of the world. Our research is based on the use of systematic boat-based surveys for describing the distribution and habitat use of different marine mammal species. We employ photo-identification techniques for the recognition of individual whales and dolphins, and we have developed new statistical approaches for using these data to determine abundance estimates and occupancy patterns. This photographic sampling is complemented by the collection of skin and faecal samples for molecular genetic analysis, which are being used to assess levels of genetic diversity and investigate the structuring of marine mammal populations. The use of Geographic Information Systems (GIS) mapping techniques allows us to describe species' distribution within the study area; and, in 2003 we began a non-invasive tagging project to provide information on three-dimensional habitat use of deep diving cetaceans.

Key Research Objectives:

Long-term research objectives are:

- To investigate marine mammal species' occurrence, distribution and the abundance around the Bahamas to contribute towards management and conservation directives in the wider Caribbean region.
- To investigate the ecology of coastal Atlantic bottlenose dolphins on Little Bahama Bank, and monitor population trends to contribute towards future management of this population.
- To investigate the ecology of Blainville's beaked whales (dense-beaked whales) to aid in the conservation of beaked whale species in the Bahamas and elsewhere around the world.

The specific research objectives addressed this field season were:

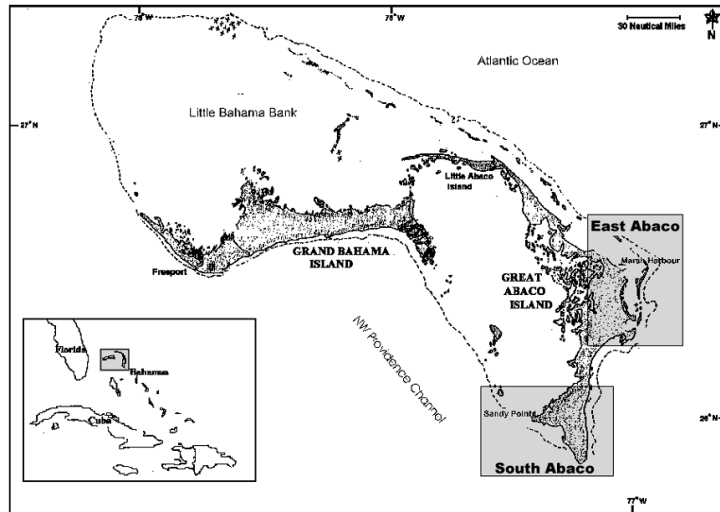
- To conduct vessel surveys to search for marine mammals around Great Abaco Island, including random line transects, in order to assess species' distribution and habitat requirements.
- To photo-identify marine mammal species, with particular emphasis on bottlenose dolphins, Blainville's beaked whales and sperm whales, to provide sufficient data for the statistical assessment of occupancy patterns, abundance and social organization.

- To collect skin and faecal samples from marine mammal species, focussing on Blainville's beaked whales and sperm whales, to investigate population and social structuring using molecular genetic techniques, and to identify prey species.

Summary of 2004 Field Effort

During the 2004 field season, the BMMS team covered 3,285 nautical miles (over 6,000 km) during 101 vessel surveys in the northern Bahamas (see Figure 1). The majority of surveys were conducted in the South Abaco study site, but 6 surveys were run in East Abaco as well. Most surveys were opportunistic vessel surveys allowing us to maximise our encounter rate and photo-identification efforts. In order to gather non-biased data on species' distribution, we also completed 9 random-line transects in South Abaco during 2004, allowing us to build on our distribution dataset for cetaceans found in Northwest Providence Channel, with 5 different pelagic species found in 15 encounters on transect. Marine mammals were found during 69 of the all vessel surveys, or during 68% of the surveys run. Six hundred and eighty-three hours was spent searching for marine mammals during vessel surveys, while 121 hours of observation and habitat use data was gathered during encounters.

Figure 1. Map of the northern Bahamas showing the study areas surveyed by BMMS in 2004.



During 2004, BMMS continued the tagging study to investigate the diving behaviour of cetaceans. The tag is deployed from a long pole and attached to the whale's back using a suction cup, and is equipped with a time-depth recorder and radio transmitter, which aids in the subsequent retrieval of the tag and associated dive profile data. Unfortunately, the only beaked whales encountered during the tagging effort in 2004 included only mother/calf pairs and our protocols prohibited tagging these individuals. However, this work is expected to become the focus of a PhD study and hopes to be continued over the next 2 years.

Marine Mammal Encounters

During the 2004 field season, there were 123 sightings of marine mammals, including nine different species and totaling 1500 animals. All of the sightings consisted of toothed whale species in the Order Cetacea, Suborder Odontocete, including one endangered species, the sperm whale. The majority of sightings (36%) were of the coastal or inshore ecotype of Atlantic bottlenose dolphins found on the shallow carbonate banks. Other frequently encountered species

included Blainville's beaked whales (21% of sightings), sperm whales (14%) and dwarf sperm whales (12%). Eleven faecal and sloughed skin samples were collected opportunistically during encounters with Blainville's beaked whales and sperm whales. Table 1 lists the species sighted and the number of encounters and samples collected from each species.

As in past years, occasionally there were mixed species encountered simultaneously; however, this year there were quite interesting mixes of species. These included a single sub-adult pilot whale travelling with a group of sperm whales, a single Atlantic spotted dolphin seen amongst a group of Blainville's beaked whales during a surfacing sequence, and a large group of melon-headed whales that briefly chased the coastal bottlenose dolphins at Rocky Point. These mixed groups demonstrate the potential for disease transmission between species.

During 2004 there were two additional species reported in the Bahamas by the public. A group of 45 short-finned pilot whales (*Globicephala macrorhynchus*) was seen off Calabash Bay, Long Island on February 13th, and 12 Risso's dolphins (*Grampus griseus*) were sighted off Elbow Cay, Abaco on March 7th.

Table 1. Marine mammal species encountered in the waters around Great Abaco Island, northern Bahamas, during the 2004 field season.

Common name	Scientific name	No. encounters	No. enc. during transects	No. faecal or sloughed skin samples
Atlantic bottlenose dolphin – coastal ecotype	<i>Tursiops truncatus</i>	44	0	0
Atlantic spotted dolphin	<i>Stenella frontalis</i>	9	1	0
Melon-headed whale	<i>Peponocephala electra</i>	6	0	0
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	1	0	0
Dwarf sperm whale	<i>Kogia sima</i>	15	0	0
Pygmy sperm whale	<i>Kogia breviceps</i>	1	1	0
Sperm whale	<i>Physeter macrocephalus</i>	17	3	8
Blainville's beaked whale	<i>Mesoplodon densirostris</i>	26	8	3
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	3	2	0
Unknown small		1	0	0

cetacean				
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2004 Strandings

There were 4 stranding events in Abaco during 2004 which we able to respond to. The first of these was a 30-foot sub-adult male sperm whale found dead by a local fisherman off Sandy Point on March 2nd. The carcass was severely scavenged by sharks, but was towed to the beach to conduct a necropsy. Standard measurements were taken and specimens were collected for forensic analysis to determine the cause of death. The remaining carcass was then buried above the high-tide mark so the skeleton can later be exhumed for an educational display.

On April 5th we responded to a report of a dead whale at the Hole in the Wall beach. Examination of the carcass found that the animal was a sub-adult female Cuvier’s beaked whale that had apparently live stranded approximately one week prior. It was high on the shore and had no evidence of shark bites, but was in an advanced state of decomposition by the time of the examination. We took measurements, removed a tooth, collected a skin/blubber sample, and photographed the carcass. We later returned to collect the skull and several vertebrae which are being held at BMMS.

On June 26th we received a report of a small minke whale (18 foot-long) in the Bight of Old Robinson, just north of Little Harbour. It was in shallow water but did not appear distressed (i.e. was still swimming). On July 14th we responded to a report of the remains of a dead whale on the beach on the north side of the Bight of Old Robinson. Examination of the decomposed remains found that the animal was sub-adult minke whale (*Balaenoptera acutorostrata*), and the skull and other bones were recovered and held at BMMS. This is believed to be the same whale sighted alive in the Bight 3 weeks earlier.

On July 27th we recovered bones from an adult humpback whale skeleton (*Megaptera novaeangliae*) that was found amongst the reef off Elbow Cay. It was estimated that this animal had died many years prior and the recent strong easterly winds had uncovered the skeleton. One side of the lower jaw, two ribs, a scapula and several vertebrae are on display at BMMS in Sandy Point.

Acknowledgements

The Bahamas Marine Mammal Survey acknowledges Earthwatch Institute for providing an annual research grant in order to cover field expenses for this study since 1992. This study would not be possible without the enthusiastic help of our volunteer research staff, student interns and Earthwatch Institute volunteers over the years. This field season, the research assistants included Leigh Hickmott, Pam Church, Charlotte Dunn, Olivia Patterson, Lisa Wozniak; summer intern, Tanique Pratt; and ten great teams of Earthwatch volunteers. BMMS is a research project of the Center for Whale Research, WA and acknowledges their continued support. The project is grateful for donations from the McTaggart Foundation and Bob and Patty Toler.

Publications & Presentations

Scientific papers:

Parsons K. M., J. W. Durban and D.E. Claridge (2003). Male-male aggression renders bottlenose dolphin (*Tursiops truncatus*) unconscious. *Aquatic Mammals* **29(3)**: 360-362.

Claridge, D.E. Fine-scale distribution and habitat selection of beaked whales. Thesis submitted for Master of Science in Zoology, November 2003, University of Aberdeen, Scotland, UK. 136 pp.

Workshops and reports:

Preliminary Field Report 2004 to Earthwatch Institute, Maynard, MA. 8 pp.

US Marine Mammal Commission beaked whale workshop, April 2004, Baltimore, MD (attended by D. Claridge, K. Balcomb)

Sea Mammal Research Unit beaked whale workshop, November 24-25th, 2004, U of St. Andrew's, Scotland (attended by D. Claridge)

Marine Mammal Protection Act review, Nassau, August 2004 (attended by D. Claridge)

Presentations:

“A genetic and environmental basis for social affiliations among bottlenose dolphins”, presented by Dr. Kim Parsons, 15th Biennial Conference on the Biology of Marine Mammals, December 14-19th, 2003, Greensboro, NC.

“Examining distribution and habitat preferences of deep-diving cetaceans, including beaked whales, in Northwest Providence Channel, the Bahamas using geographic information system (GIS) mapping techniques” presented by Diane Claridge, 15th Biennial Conference on the Biology of Marine Mammals, December 14-19th, 2003, Greensboro, NC.

“Bottlenose dolphins: Kith or Kin” presented by Dr. John Durban, March 2004 in Hope Town and Marsh Harbour, Abaco.

Popular articles:

Guide to the most common whales and dolphins of Abaco, in “Cruising Guide to the Abacos”, White Sound Press, New Smyrna Beach, FL., reprinted 2004.