

STUDY TITLE: Distribution and Abundance of Cetaceans in the North-Central and Western Gulf of Mexico

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SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREAS: Central and Western Gulf of Mexico

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CUMULATIVE PROJECT COST: \$3,167,116

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KEY WORDS: North-central and western Gulf of Mexico; marine mammals; cetaceans; distribution; abundance; density; bioacoustics; hydrography; satellite tagging; aerial surveys; shipboard surveys

BACKGROUND: The Minerals Management Service (MMS) has the responsibility to assure that oil and gas operations on the continental slope in the Gulf of Mexico are conducted in a manner that reduces risks to the marine environment. To meet their responsibilities under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973, the MMS must understand the effects of oil and gas operations on marine mammals. MMS Section 7 consultation with the National Marine Fisheries Service identified a need for knowledge of marine mammals in deep waters of the Gulf. This program was designed to meet these needs.

OBJECTIVES: The purpose of this study (hereafter called GulfCet) was to determine the distribution and abundance of cetaceans in the areas potentially affected by future oil and gas activities along the continental slope in the north-central and western GOM.

DESCRIPTION: The GulfCet Program was a 3.75 year project (1 October 1991 through 15 July 1995). The study was restricted to the area bounded by the Florida-Alabama border, the Texas-Mexico border, and the 100- and 2,000-m isobaths. A major part of the GulfCet Program's field research consisted of seasonal, line transect surveys to determine the distribution and abundance of cetaceans in the study aircraft, 2) visual surveys from ships, and 3) acoustic surveys using a linear hydrophone array towed behind a visual survey ship. The hydrographic portion of the program was designed to sample to meso-to-large scale features in conjunction with remote sensing. Finally, tagging and tracking of sperm whales using satellite telemetry was attempted. Sperm whales were successfully tracked by passive acoustic means.

SIGNIFICANT CONCLUSIONS: Cetaceans were sighted throughout the length of study area at all water depths. However, distinct species were found at specific water depths. Atlantic spotted dolphins were sighted primarily near the shelf edge (mean = 197 m), while bottlenose dolphins were observed in somewhat deeper water (mean = 294m). Risso's dolphins, short-finned pilot whales, pygmy/dwarf sperm whales, rough-toothed dolphins spinner dolphins, sperm whales, striped dolphins, *Mesoplodon* spp., pantropical spotted dolphins, clymene dolphins, and beaked whales were found in much deeper water (mean = 700-1,300 m). Several poorly known species turned out to be moderately common (beaked whales, pygmy and dwarf sperm whales, melon-headed whales, Fraser's and clymene dolphins). Both melon-headed whales and Fraser's dolphins were almost completely unknown in the Gulf of Mexico before this study began.

STUDY RESULTS: A total of 351 cetacean groups representing 17 species were sighted on-effort during eight aerial surveys. Sperm whales, pygmy/dwarf sperm whales, bottlenose dolphins, Risso's dolphins, and pantropical spotted dolphins were the most commonly sighted species. A total of 683 shipboard marine mammal sightings of at least 19 species were made during the eleven ship surveys. Pantropical spotted dolphins and bottlenose dolphins were the most common small cetaceans and sperm whales were the most common large cetacean seen by ship. Marine mammals acoustic contacts totaled 487. Of that number, 124 contacts were recorded, representing 12 species. Sperm whales were the most commonly recorded species, accounting for 56% of identified contacts. The majority of the sperm whale acoustic contacts have been off the mouth of the Mississippi River and on the western side of the study area. During the GulfCet cruises, several anticyclonic (warm core) eddies (Trinton, Unchained, Vazquez, Whopper, and Extra) were detected. Small cyclonic (cold water) eddies have often been observed in association with the periphery of these dominant features. These are generally areas of higher chlorophyll concentration, and are therefore indicative of increased primary productivity.

STUDY PRODUCTS: Davis, R., G. Scott, B. Würsig, W. Evans, G. Fargion, L. Hansen, R. Benson, K. Mullin, N. May, T. Leming, B. Mate, J. Norris, and T. Jefferson. 1994. Distribution and abundance of marine mammals in the north-central and western Gulf of Mexico: Interim Report prepared in two volumes by the Texas Institute of Oceanography and the National Marine Fisheries Service. U.S. Dept. of the Interior, Minerals mgmt. Service, Gulf of Mexico OCS Region, New Orleans, LA.

Volume I. Technical Report, 131 pp. OCS Study MMS 94-0003.
Volume II. Appendix, 813 pp. OCS Study MMS 94-0004.

Davis, R.W., and G. S. Fargion, eds. 1996. Distribution and abundance of cetaceans in the north-central and western Gulf of Mexico: Final report prepared in three volumes by the Texas Institute of Oceanography and the National Marine Fisheries Service. U.S. Dept. of the Interior, Minerals Mgmt. Service, Gulf of Mexico OCS Region, New Orleans, LA.

Volume I. Executive summary, 29 pp. OCS Study MMS 96-0026.
Volume II. Technical Report, 357 pp. OCS Study MMS 96-0027.
Volume III. Appendix A-C. OCS Study MMS 96-0028.
Appendix A, 419 pp.
Appendix B, 501 pp.
Appendix C Part 1, 561 pp.
Appendix C Part 2, 489 pp.