

## Marine Mammal Sightings in the Caribbean Sea and Gulf of Mexico, Summer 1991

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**ABSTRACT.** – In the summer of 1991, we conducted marine mammal surveys in the Gulf of Mexico, Caribbean Sea, and a small portion of the southwestern North Atlantic. A total of 193 hours of survey effort was conducted, and there were 60 marine mammal sightings. Species identified (number of sightings in parentheses) were: sperm whale *Physeter catodon* L. (6), Cuvier's beaked whale *Ziphius cavirostris* G. Cuvier (1), short-finned pilot whale *Globicephala macrorhynchus* Gray (1), rough-toothed dolphin *Steno bredanensis* (Lesson) (1), bottlenose dolphin *Tursiops truncatus* (Montagu) (6), Atlantic spotted dolphin *Stenella frontalis* (G. Cuvier) (2), pantropical spotted dolphin *S. attenuata* (Gray) (10), spinner dolphin *S. longirostris* (Gray) (1), and striped dolphin *S. coeruleoalba* (Meyen) (3). Distribution of sightings was largely related to sighting conditions, but there were concentrations of sightings in areas with high sea floor relief – in the Straits of Florida, the area west of Martinique, and along the Mexican Ridge.

**RESUMEN.** – Durante el verano de 1991 realizamos un estudio de mamíferos marinos en el Golfo de México, el mar Caribe, y una pequeña porción del suroeste del Atlántico Norte. Se concluyeron 193 horas de investigación y se avistaron 60 grupos de mamíferos. Las especies identificadas fueron (entre paréntesis el número de avistamientos): cachalote *Physeter catodon* L. (6), zifio de Cuvier *Ziphius cavirostris* G. Cuvier (1), calderón de aletas cortas *Globicephala macrorhynchus* Gray (1), delfín de dientes rugosos *Steno bredanensis* (Lesson) (1), tursiión *Tursiops truncatus* (Montagu) (6), delfín pintado *Stenella frontalis* (G. Cuvier) (2), estenela moteada *S. attenuata* (Gray) (10), estenela giradora *S. longirostris* (Gray) (1), y estenela listada *S. coeruleoalba* (Meyen) (3). La distribución de grupos vistos estuvo relacionada en gran parte con las condiciones de visibilidad, pero hubo concentraciones de grupos en áreas con alta topografía del fondo – a lo largo de los estrechos de la Florida, en el área al oeste de Martinica, y a lo largo de la Cordillera Mexicana.

### INTRODUCTION

The marine mammal fauna of the Gulf of Mexico and the Caribbean Sea is diverse. It includes at least seven species of mysticete cetaceans, 24 odontocete cetaceans, one pinniped, and one sirenian (van Bree, 1975; Schmidly, 1981; Jefferson et al., 1992). Until the 1950's, another pinniped, the Caribbean monk seal *Monachus tropicalis* (Gray) was present in this area, but it is now considered extinct (Le Boeuf et al., 1986). The ranges of many beaked whales of the genus *Mesoplodon* are poorly-known, and perhaps species other than the three represented by confirmed records will be found in this area. For instance, True's beaked whale *Mesoplodon mirus* True is known from the nearby Bahamas and the

east coast of Florida, and may also occur in the Gulf of Mexico or Caribbean Sea (Schmidly, 1981; Mead, 1989).

Despite being adjacent to several major marine research centers, the marine mammal fauna of the Gulf and Caribbean has remained poorly known. Most of our knowledge comes from strandings and opportunistic sightings (Erdman, 1970; Halewijn and van Bree, 1972; Erdman et al., 1973; Taruski and Winn, 1976; Schmidly, 1981; Watkins and Moore, 1982; Watkins et al., 1985). In the eastern Caribbean, catches in direct fisheries for small cetaceans have provided additional information (Caldwell and Caldwell, 1975; Caldwell et al., 1971, 1976). Three projects have collected information, using aircraft, on oceanic marine mammal distribution and

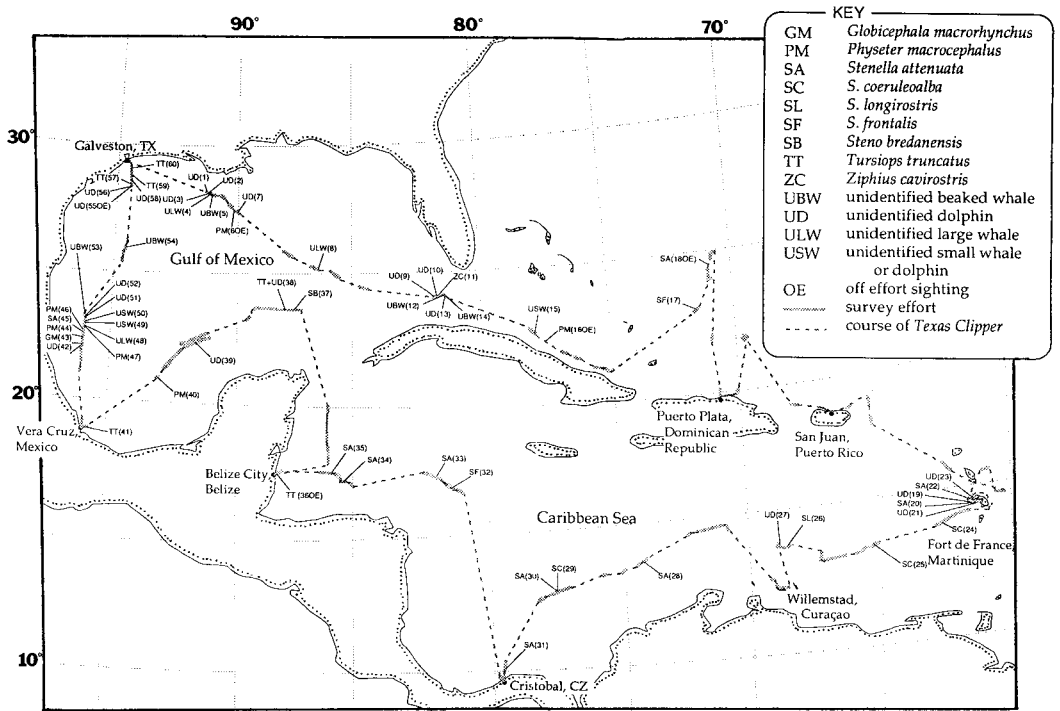


FIG. 1. Map showing the cruise track, regions of sighting effort, and locations of marine mammal sightings.

abundance in the Gulf of Mexico, although they covered survey blocks in limited areas of the northern Gulf (Fritts and Reynolds, 1981; Fritts et al., 1983; Mullin et al., 1991).

The first large-scale vessel surveys for oceanic marine mammals in the northern Gulf of Mexico were conducted by the National Marine Fisheries Service (NMFS), using the NOAA ship *Oregon II*, in 1990,

1991, 1992, and 1993 (L. J. Hansen and K. D. Mullin, pers. comm.). Starting in 1992, Texas A&M University (TAMU) and NMFS initiated a three-year project, the GULF-CET Project, to study distribution and abundance of cetaceans in the northern Gulf of Mexico. These surveys have already provided much information on the oceanic marine mammals of the region, and

TABLE 1. Summary of cruise legs, with dates, start and end ports, number of hours of survey effort, number of marine mammal sightings, modal sea state (Beaufort), and observer indicated.

Leg	Dates	Start-end	Effort (h)	No. stgs.	Modal sea state	Obs.
1	4-13 June	Galveston-Puerto Plata	47.44	18	3-4	TAJ
2	17-20 June	Puerto Plata-San Juan	11.70	0	4	TAJ
3	25-27 June	San Juan-Fort de France	14.58	3	4	TAJ
4	1-6 July	Fort de France-Willemstad	29.36	6	5	SKL
5	8-12 July	Willemstad-Cristobal	29.97	4	6	SKL
6	14-20 July	Cristobal-Belize City	19.25	5	4	SKL
7	23-26 July	Belize City-Veracruz	18.09	5	5	SKL
8	29 July-2 August	Veracruz-Galveston	22.41	19	0-2	SKL
Total			192.8	60		

further surveys are planned for 1994 and beyond, by both NMFS and TAMU. Apparently no such large-scale survey efforts have been conducted in the southern Gulf or Caribbean Sea.

This paper reports the results of an opportunistic marine mammal survey during the cruise of a merchant marine training vessel in the Gulf of Mexico, Caribbean Sea, and a small portion of the southwestern North Atlantic in the summer of 1991. Although based on only one cruise, the information is important because of: (1) lack of knowledge on marine mammals in the southern Gulf of Mexico and Caribbean Sea, and (2) absence of planned research effort in these areas in the near future.

#### MATERIALS AND METHODS

The survey was conducted aboard the United States Training Ship *Texas Clipper*, operated by Texas A&M University, Galveston. The ship departed from Galveston, Texas, on 4 June 1991 and returned to Galveston on 2 August 1991. Waters of the Gulf of Mexico, southwestern North Atlantic, and Caribbean Sea were surveyed (Fig. 1; Table 1).

The *Texas Clipper* is 144 m long and has a gross weight of 9644 tons. Surveys were conducted from atop the tool storage house on the bow. This location allowed for an unobstructed 180° view ahead of the vessel. A pair of *Fujinon* 25 × 150 binoculars was mounted on a pedestal welded atop the tool house. Eye level was approximately 15 m above sea level. A single observer (one of the authors) conducted surveys by scanning 90° to each side for the first 7–10 minutes of each half hour through the 25× binoculars. The remaining 20–23 minutes were spent searching for sighting cues with naked eye and 10× binoculars. We used Leatherwood et al. (1976) as our primary identification guide, incorporating recent taxonomic revisions of clymene/spinner and spotted dolphins (*Stenella* spp.) (Perrin et al., 1981, 1987). It was rarely possible to turn the ship to approach animals. Observations of bowriding dolphins were made from the bow, about 12 m above the water. Positions (latitude and longitude) were obtained from a Global Positioning System;

some sighting positions were dead-reckoned. Sighting angles were measured with a scale on the base of the binoculars and distances were estimated by eye. Sea Surface Temperature (SST) was recorded, when possible, using a bucket thermometer or as indicated by the engine room thermometer (not calibrated). Water depths for sightings were estimated post-cruise from nautical charts. Depths less than 300 m are accurate to about ±50 m, and those greater than 300 m to ±200 m. All means are given ±1 standard deviation.

#### RESULTS

A total of 193 hours of survey effort were conducted. There were 60 marine mammal sightings.

*Sperm Whale Physeter catodon* L. —These were the only great whales observed during the cruise. There were six sightings, all but one in the Gulf of Mexico (Table 2; Fig. 1, #6, 16, 40, 44, 46, 47). Mean pod size was  $3.3 \pm 1.03$  individuals, and mean water depth was  $2157.5 \pm 568.73$  m.

*Cuvier's Beaked Whale Ziphius cavirostris* G. Cuvier. —There was one sighting of this species (Table 2; Fig. 1, #1 1). The animals lifted their heads above the water upon surfacing, thereby making them identifiable from their blunt, short-beaked heads.

*Unidentified Beaked Whales (Ziphiidae)*. —There were five sightings of unidentified beaked whales (Table 2; Fig. 1; #5, 12, 14, 53, 54). These animals were only observed in conditions of Beaufort 2 or better, and at distances greater than 0.6 km. Group sizes averaged  $2.8 \pm 0.84$  individuals. All were observed in deep water (mean =  $1700.0 \pm 835.74$  m).

*Short-finned Pilot Whale Globicephala macrorhynchus* Gray. —A single sighting was recorded (Table 2; Fig. 1, #43). The animals were stationary at the surface and lined-up abreast when first seen; then the entire pod dove and was not resighted.

*Rough-toothed dolphin Steno bredanensis* (Lesson). —We sighted one group (Table 2; Fig. 1, #37). They approached the vessel and rode the bow wave of the ship for about six minutes. This appears to be the first sighting of this species in the southern Gulf of Mexico (see Jefferson et al., 1992).

TABLE 2. Details of marine mammal sightings identified to species (or family for beaked whales).

No.	Date	Position	Water depth (m)	Group size	SST (°C)
Sperm whale					
6	5 June	26°52'N, 89°55'W	2400	5	—
16	8 June	22°06'N, 77°25'W	1100	4	28.4
40	25 July	21°01'N, 94°04'W	2775	3	—
44	30 July	22°35'N, 96°34'W	2290	3	31.5
46	30 July	22°47'N, 96°35'W	2330	3	31.5
47	30 July	23°01'N, 96°36'W	2050	2	31.5
Cuvier's beaked whale					
11	7 June	23°46'N, 81°27'W	1280	4	—
Unidentified beaked whale					
5	5 June	27°21'N, 91°14'W	1230	3	—
12	7 June	24°00'N, 81°17'W	1170	4	—
14	7 June	23°55'N, 81°07'W	1145	2	—
53	30 July	23°35'N, 96°43'W	1855	2	—
54	31 July	25°53'N, 94°46'W	3100	3	—
Short-finned pilot whale					
43	30 July	22°08'N, 96°29'W	2290	25	—
Rough-toothed dolphin					
37	24 July	25°31'N, 87°44'W	3290	20	—
Bottlenose dolphin					
36	18 July	17°30'N, 88°00'W	<30	3	—
38	24 July	23°52'N, 87°50'W	85	15	—
41	26 July	18°45'N, 96°00'W	<30	15	—
57	2 August	28°11'N, 94°24'W	45	20	—
59	2 August	28°42'W, 94°24'W	27	2	—
60	2 August	28°42'W, 94°24'W	27	3	—
Atlantic spotted dolphin					
17	10 June	23°36'N, 71°21'W	5425	15	26.7
32	16 July	16°10'N, 81°56'W	40	7	28.9
Pantropical spotted dolphin					
18	12 June	24°10'N, 71°14'W	5300	20	27.5
20	28 June	14°40'N, 61°15'W	2010	40	—
22	1 July	14°38'N, 61°15'W	2050	30	—
28	10 July	13°12'N, 74°16'W	3915	6	—
30	11 July	11°50'N, 78°05'W	3630	2	27.8
31	12 July	10°05'N, 79°58'W	1865	50	27.8
33	16 July	16°20'N, 82°38'W	50	4	—
34	17 July	17°21'N, 85°20'W	4875	4	—
35	17 July	17°32'N, 86°22'W	4100	4	27.8
45	30 July	22°41'N, 96°34'W	2290	60	—
Spinner dolphin					
26	5 July	13°23'N, 68°56'W	4330	75	—
Striped dolphin					
24	2 July	13°56'N, 62°49'W	1480	30	—
25	4 July	12°55'N, 67°00'W	4600	25	—
29	11 July	11°53'N, 78°01'W	3630	1	—

*Bottlenose Dolphin Tursiops truncatus* (Montagu). —Six sightings were recorded (Table 2; Fig. 1, #36, 38, 41, 57, 59, 60). The average group size was  $9.7 \pm 7.89$  animals, and they were seen only in relatively shallow water (mean water depth =  $40.7 \pm 22.74$  m—in the analysis, 30 m was used for depths of < 30 m). In sighting 38, the dolphins rode the bow wave for about 11 minutes; in the last minute, they were joined by two spotted dolphins (either pantropical spotted dolphins or, more likely based on the water depth, Atlantic spotted dolphins) before all the dolphins departed.

*Atlantic spotted dolphin Stenella frontalis* (G. Cuvier). —There were two sightings (Table 2; Fig. 1, #17, 32). The first group rode the bow for four minutes, and the second group (including a cow/calf pair) rode for about seven minutes. Although sighting 17 occurred in deep water (5425 m), it was located near shallower waters of the Bahama Escarpment.

*Pantropical Spotted Dolphin Stenella attenuata* (Gray). —We logged 10 sightings, more than for any other species (Table 2; Fig. 1, #18, 20, 22, 28, 30, 31, 33, 34, 35, 45). Herd sizes averaged  $22.0 \pm 21.73$  individuals, and the average water depth was  $3008.5 \pm 1620.23$  m. The shallow water (50 m) associated with sighting 33 was in an area (the Nicaraguan Rise) where the continental shelf juts out much more than in the surrounding coastline. In general, the pantropical spotted dolphins were very lightly spotted, and in some groups that rode the bow, spots were not visible. In this respect, they appeared similar to far offshore and Hawaiian spotted dolphins of the tropical Pacific and mid-tropical Atlantic (Perrin, 1975:Fig. 7; Perrin et al., 1987).

*Spinner Dolphin Stenella longirostris* (Gray). —One sighting was recorded (Table 2; Fig. 1, #26). The animals rode the bow wave for about 40 minutes, providing ample opportunity to observe them closely. They had a three-part color pattern, and generally appeared to resemble the spinners shown in Fig. 1 of Taruski and Winn (1976), i.e., Gray's spinner dolphin (*S. l. longirostris*, Perrin, 1990).

*Striped Dolphin Stenella coeruleoalba* (Mey-

en). —There were three sightings (Table 2; Fig. 1, #24, 25, 29). Both herds in sightings 24 and 25 rode the bow wave of the vessel for 11 minutes and 3 minutes respectively. Sighting 29 was exceptional; the single young striped dolphin accompanied the ship for six hours, and periodically rode the bow wave. It repeatedly performed high leaps, often falling back into the water on its side. About an hour into the sighting, it was joined at the bow by two pantropical spotted dolphins (sighting 30), but these animals only stayed for about two minutes.

*Unidentified Cetaceans*. —Of the 24 unidentified sightings, 18 were of dolphins (two were recorded as "probably pantropical spotted dolphins" and three were "probably bottlenose dolphins"), three were small whales or dolphins, and three were large whales (all of the latter were noted to be "probably sperm whales").

## DISCUSSION

Most of the sightings were made in the Gulf of Mexico, under good sighting conditions (Beaufort 0–3). Outside of the Gulf, the constant northeasterly blow of the Trade Winds resulted in conditions of mostly Beaufort 4 or above, dramatically affecting our ability to sight marine mammals. There were very few sightings in the small portion of the southwestern North Atlantic Ocean surveyed. Other conditions, such as absence of bird and flying fish sightings, and paucity of fishing boats, suggested low productivity in this area, as indicated by Margalef (1971). In the Caribbean Sea, while there were frequent bird and flying fish encounters, the seas were rarely less than Beaufort 5 and few sightings were made that did not result from dolphins coming to ride the bow wave.

The six sightings of beaked whales (Ziphiidae) indicate that this poorly-known group may not be rare in the study area. Because all the sightings occurred during calm conditions (Beaufort 2 or below), it is likely that many other groups were missed during the many hours of effort in poor sighting conditions.

Among the dolphins sighted in deep wa-

ters (past the edge of the continental shelf), pantropical spotted dolphins were, by far, the most frequently-identified species. This agrees with the results of the *Oregon II* surveys in the Gulf of Mexico, in which this species accounted for 33% of all marine mammal sightings (Johnson et al., 1991). This species is also the most commonly sighted oceanic cetacean on TAMU'S GULFCET surveys (TAJ, pers. obs.).

Bottlenose dolphins were the most common species sighted shoreward of the continental shelf edge. They are considered to be the most common inshore species throughout the study area (Erdman, 1970; Erdman et al., 1973; Schmidly, 1981).

Although sighting conditions may have been a major factor in the distribution of our sightings, they may not be the only factor. Three areas (Fig. 1) had concentrations of sightings: (1) the Straits of Florida, between Florida and Cuba; (2) the area just west of Martinique; and (3) the Mexican Ridge, off the northeastern coast of Mexico. These are areas of steep, but relatively shallow, bottom topography. Several studies have found higher densities of cetaceans, especially delphinids, in such habitats (Evans, 1971; Hui, 1979, 1985; Seizer and Payne, 1988).

It is clear that the Gulf of Mexico and the Caribbean Sea possess a rich marine mammal fauna. Future ship and aerial surveys in this area will provide much needed information on the natural history of the marine mammals of this interesting region.

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