

Marine Mammal Mortality and Strandings Along the Pacific Coast of Colombia

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ABSTRACT

Information on marine mammal mortality and strandings from the Pacific coast of Colombia was gathered from museum collections and field work between March and December 1993. Field interviews and examination of osteological remains were conducted between Bahía Solano and La Vigía on the Pacific coast of Colombia. A total of 219 strandings were documented between 1930 and 1993, for which osteological or photographic evidence exists for 101. Strandings comprised Balaenopteridae (8), Physeteridae (14), Ziphiidae (2), Delphinidae (45) and Otariidae (1), while 22 were unidentified mysticetes, 102 were unidentified odontocetes, 17 were unidentified cetaceans and 8 were unidentified pinnipeds. Fifteen species were recorded, with *Balaenoptera edeni*, *Ziphius cavirostris* and *Globicephala macrohynchus* being the first osteological records of these species for the Pacific coast of Colombia and *Balaenoptera musculus*, *Kogia simus*, *Peponocephala electra*, *Pseudorca crassidens*, *Stenella coeruleoalba* and *Otaria byronia* being the first osteological records of these species for the whole of Colombia. The presence of *O. byronia* in Colombia represents its northernmost Pacific distribution. Two coastal communities were found to carry out directed captures of dolphins for fishing bait. Entanglement with multifilament and monofilament nets was also thought to cause high mortality rates in the area.

KEYWORDS: HUMPBACK WHALE; BLUE WHALE; BRYDE'S WHALE; SPERM WHALE; DWARF SPERM WHALE; PANTROPICAL SPOTTED DOLPHIN; STRIPED DOLPHIN; SHORT-FINNED PILOT WHALE; GOOSEBEAKED WHALE; MELON HEADED WHALE; SOUTH PACIFIC; STRANDINGS; INCIDENTAL CAPTURE; FALSE KILLER WHALE; PINNIPEDS

INTRODUCTION

The study of cetaceans in Colombia is relatively recent in comparison to many other Latin American countries. It was not until the mid-1980s that research on marine mammals began. On the Pacific coast, research has been carried out on the population dynamics and behaviour of migrating humpback whales, *Megaptera novaeangliae* (Flórez-González, 1989). Cuervo *et al.* (1986) and Vidal (1990) summarised sighting records of the different species. Prieto (1990) presented a preliminary report on fisheries interactions with small cetaceans.

Despite this, there is a dearth of information on the basic biology, life history and mortality of these species and consequently no government strategy for their conservation. In particular, the subject of mortality and strandings of these mammals has not been addressed, despite the large number of animals that have been found dead on shore or killed in the past 64 years.

This paper documents and analyses stranding and mortality records for the Pacific coast of Colombia and summarises information on marine mammals specimens in museum collections. It represents a first step towards systematic marine mammal research aimed at providing for their conservation along the Pacific coast of Colombia.

METHODS

The study area selected comprised a 820km strip of the Pacific coast of Colombia between Bahía Solano in the Department of Chocó (6°13'N, 77°24'W) and La Vigía in

the Department of Nariño (2°38'N, 78°25'W), and the national parks of Utría (6°02'N, 77°22'W) and Isla Gorgona (2°47'N, 78°06'W).

Museum collections and archives were visited between January 1992 and March 1994. All available specimens and data on marine mammal deaths from the Pacific coast of Colombia were examined, identified using the species keys of De Blase and Martin (1974) and Ernst (1977), and documented by craniometry and photographs following the techniques of Hersh and Duffield (1990) and Ross (1984).

The study area was monitored between March and December 1993. The beaches were searched for stranded animals or osteological remains. Skulls and bones found during the field season were also examined and documented as above. Fishermen were interviewed to assess fisheries interactions with marine mammals. Local residents were interviewed to obtain information regarding previous stranding cases, particularly possible causes and whether they possessed marine mammal osteological remains.

Beaches or shores where strandings occurred were categorised for type (sandy, rocky or mangrove-lined), contour (concave, convex or straight) and the slope of the beach was measured.

RESULTS AND DISCUSSION

A total of nine museum collections in Colombian universities, government agencies, museums and foundations held marine mammal osteological remains. These were: Museo de Ciencias Naturales (Universidad de

La Salle), Museo del Mar (Universidad Jorge Tadeo Lozano), Unidad de Zoología del Departamento de Biología (Universidad del Valle), Fundación Yubarta, Museo de Ciencias Naturales 'Federico Carlos Lehmann V.', Universidad Tecnológica del Chocó - Seccional Bahía Solano, Oficina Regional del Norte del Pacífico (Instituto Nacional de Pesca y Acuicultura), Files of Fundación Natura, Museo Marino de Isla Gorgona and Parque Nacional Utría. In these collections, 11 species and 32 specimens of marine mammals were registered (Table 1).

Table 1

Marine mammal species and number of specimens documented dead or stranded, housed in museum collections or found in the field from the Pacific coast of Colombia.

Species	Specimens in collections	Specimens in the field	Total
Otariidae			
<i>Otaria byronia</i>	0	1	1
Balaenopteridae			
<i>Balaenoptera edeni</i>	1	0	1
<i>Balaenoptera musculus</i>	1	0	1
<i>Balaenoptera</i> sp.	1	0	1
<i>Megaptera novaeangliae</i>	1	4	5
Physeteridae			
<i>Physeter macrocephalus</i>	5	8	13
<i>Kogia simus</i>	0	1	1
Ziphiidae			
<i>Ziphius cavirostris</i>	0	2	2
Delphinidae			
<i>Globicephala macrorhynchus</i>	2	6	8
<i>Grampus griseus</i>	4	0	4
<i>Peponocephala electra</i>	1	0	1
<i>Pseudorca crassidens</i>	0	1	1
<i>Stenella attenuata</i>	1	11	12
<i>Stenella coeruleoalba</i>	1	2	3
<i>Steno bredanensis</i>	1	0	1
<i>Tursiops truncatus</i>	6	9	15
Unidentified mysticete	1	5	6
Unidentified odontocete	0	8	8
Unidentified cetacean	6	11	17
Total	32	69	101

During the field season, 69 previous stranding cases with osteological or photographic evidence were registered in 38 coastal communities visited. Four of these were the same cases found in museum collections (blue whale, *Balaenoptera musculus*; Bryde's whale, *B. edeni*; humpback whale; and sperm whale, *Physeter macrocephalus*). Eleven strandings occurred in the area between January and September 1993, including: two humpback whales; a dwarf sperm whale, *Kogia simus*; two bottlenose dolphins, *Tursiops truncatus*; three pantropical spotted dolphins, *Stenella attenuata*; two unidentified cetaceans; and one southern sea lion, *Otaria byronia*.

Interviews with coastal residents led to the recording of an additional 118 stranding cases for which no osteological or photographic evidence was available, comprising 16 unidentified mysticetes, 94 unidentified odontocetes and eight unidentified pinnipeds. This brings the total number of stranding/mortality incidents for the Pacific coast of Colombia to 219. The proportion of mysticetes to odontocetes was about 1:4. Those species most frequently found dead or stranded were the bottlenose dolphin, sperm whale, pantropical spotted dolphin and short-finned pilot whale, *Globicephala macrorhynchus*.

All recorded strandings were of single animals with the exception of one school of short-finned pilot whales. Nine species not previously reported for the Pacific coast of Colombia were documented, including the Bryde's whale, blue whale*, dwarf sperm whale*, false killer whale* (*Pseudorca crassidens*), goosebeaked whale (*Ziphius cavirostris*), melonheaded whale* (*Peponocephala electra*), short-finned pilot whale, southern sea lion* and striped dolphin* (*Stenella coeruleoalba*). Those marked with an asterisk also mark the first osteological records for Colombia. Of special interest is the occurrence of the southern sea lion. All literature reviewed suggested that its northernmost Pacific range was Zorritos (4°S) in Peru (Vaz-Ferreira, 1981; King, 1983; Leatherwood and Reeves, 1983; Riedman, 1990; Reijnders *et al.*, 1993) apart from one dead animal found on Abingdon Island (Pinta) in the Galápagos Islands (Wellington and de Vries, 1976). This record therefore represents a new northern limit for this species on the Pacific coast of South America.

The year of occurrence is only known for 61 cases, with the earliest being in 1930. Most cases occurred between 1975 and 1993, with the greatest number occurring in 1990 and 1993 with 11 cases each. This is probably merely a reflection of effort. No apparent relationship was found between strandings and the occurrence of *El Niño*. The exact month of occurrence is only known for 53 cases. If these are considered, a trimodal distribution is apparent, the first peak in March and April, the second between July and September and a third is observed in December (Fig. 1). More (62.3%) of the strandings were recorded during the winter (May to December) than in the summer (37.7%).

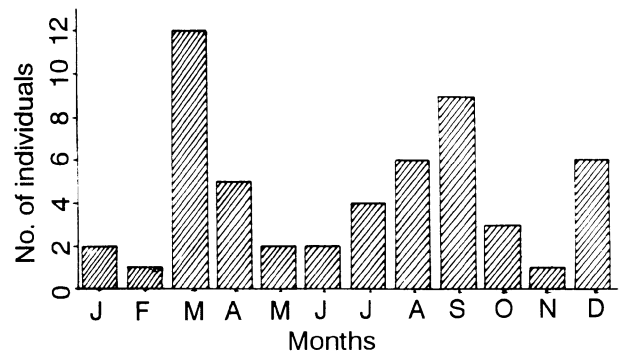


Fig. 1. Seasonality of marine mammal strandings on the Pacific coast of Colombia.

Most (65%) of the records were for the central and northern parts of the study area, while 20% were in the south and 14% were in Isla Gorgona. The strandings could be grouped into four distinct areas: Area 1 from Cupica (6°42'N, 77°30'W) to Punta Arusi (5°36'N, 77°30'W); Area 2 from Charambirá (4°16'N, 77°00'W) to Naya River (3°19'N, 77°28'W); Area 3 from Cuerval (2°40'N, 77°49'W) to Cabo Manglares (1°36'N, 79°02'W); and Area 4 Isla Gorgona (2°47'N, 78°06'W). Some 69% of the strandings occurred on sandy beaches, 14% on sandy-rocky enclave beaches, 8% on rocky shores, 7% on mangrove shores and 2% in coral-sandy shores. Almost all shores where strandings occurred were of the straight type, slightly concave, but with a steep slope.

For various reasons, cause of death could not be determined for 82% of cases; 18% could be attributed to human interactions, either by entanglement, dynamite

fishing or direct takes. Of twenty-seven fishing villages visited, only two communities, Charambirá (Chocó) and Concherito (Cauca) were identified as conducting direct takes of pantropical spotted dolphins and bottlenose dolphins to use as bait for their requiem shark, cusk-eel and sea bass fisheries. Dolphin meat is used when usual bait (snake eel, morays and hammerhead shark) is scarce. Artisanal fishing using multifilament nets of 15 and 20cm mesh size occurred from the villages of Charambirá (Chocó) and La Vigía (Nariño), reportedly producing a 'high' incidence of accidental marine mammal entanglement and a 'high' mortality rate of whales, dolphins and sea lions. Monofilament nets of 7-7.6cm mesh size used in the shrimp fisheries also entangled marine mammals, but with a low mortality rate as the animals seem to be able to brake through them and escape. The species most commonly found entangled were the bottlenose dolphin and pantropical spotted dolphin.

It is clear that further studies to continue monitoring marine mammal deaths and strandings in the area are required to determine: (1) the degree of involvement of human interaction in marine mammal deaths; (2) the frequency of deaths and strandings; and (3) an assessment of deaths and strandings with the purpose of making recommendations for effective and efficient management of marine mammals in Colombia.

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