

A Note on the Incidental Mortality of Sperm Whales (*Physeter macrocephalus*) in Ecuador

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ABSTRACT

Between 1987 and October 1994, twenty strandings of the sperm whale (*Physeter macrocephalus*) were recorded along the Ecuadorean continental coast. In eleven cases an interaction with some type of fishing gear (usually gillnets) had occurred. Although the total number of interactions is unknown, fisheries may play an important role in the mortality of these animals. In at least three cases, the animals were taken to the beach by fishermen in order to obtain some profit. The meat and the fat may be used for bait and other parts of the animal such as the teeth and bones have an increasing market value. Although whales are protected by law in Ecuador, this additional income may provide a motive for some fishermen to enter a directed, but illegal fishery.

KEYWORDS: EASTERN TROPICAL PACIFIC; SPERM WHALES; INCIDENTAL CAPTURE; STRANDINGS

INTRODUCTION

The sperm whale (*Physeter macrocephalus*) is widely distributed in Ecuadorian waters. Its presence at these latitudes was known by the 19th century whalers who hunted them throughout the year along the continental coast and around the Galapagos Islands (Clarke, 1962; Whitehead and Hope, 1991). Investigations on the sperm whales found around the Galapagos Islands have been carried out since 1985 and have recently been extended towards continental waters (e.g. Arnbohm and Whitehead, 1989; Whitehead, 1989; Whitehead and Kahn, 1992; Kahn *et al.*, 1993).

Compared to other species, the sperm whale does not appear to be as affected by fisheries interactions. In his extensive review, Northridge (1984) noted that it is only from the Mediterranean Sea that there are reports of sperm whale mortality in fishing gear. Since 1987, we have recorded twenty sperm whale strandings on the Ecuadorean coast. In at least eleven cases the stranding appears to be the result of an interaction with fishing gear, mainly artisanal gillnets.

MATERIALS AND METHODS

The information given here is part of the strandings database of the Ecuadorian Foundation for the Study of Marine Mammals (FEMM) developed and collected between 1987 and 1994. It was obtained from villagers at the strandings sites and FEMM members. In eight of the 20 cases at least one of the authors was present. For the remainder of cases photographic evidence, bones or both were assessed. Other possible cases were ignored due to the lack of physical evidence.

The total length of the examined animals was determined in the standard way i.e. in a straight line from the tip of the head to the central notch of the flukes. Age was estimated from the teeth which were cut longitudinally, sandpaper polished and put in formic acid (10%) for 30 hours. The number of growth layer groups formed in the surface of the dentine (Perrin and Myrick, 1980) was counted.

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THE STRANDINGS

The available data are summarised in Table 1. The stranding locations are shown in Fig. 1.

Strandings occurred almost throughout the year (10 months), apparently with no seasonal tendency. For those strandings for which it could be obtained, the age/sex distribution was young males (6 cases), adult females (3), adult males (1) and calves (1). For the other nine cases although the sex could not be determined their size meant that they were young animals or adult females. This is in accord with the view that females with calves and the immature males remain in tropical/temperate waters throughout the year, while adult males make seasonal migrations to polar waters (e.g. Clarke, 1962; Whitehead, 1987).

In nine cases, cables and/or other parts of nets were found on the stranded animals, sometimes around the flukes and/or mandible. These animals had thus become entangled in some sort of net, probably artisanal gillnets. Usually these nets have a mesh size of 4" (10cm) and are used to catch large pelagic fishes such as tuna, marlin and sharks. In two cases, the interaction occurred with a tuna purse seiner, which had presumably accidentally caught the sperm whale during fishing activities.

DISCUSSION

For the 11 cases of proven interaction with some type of fishery, the subsequent stranding of the animals appeared to be the direct result of the interactions. Interactions of sperm whales with fisheries have been reported from the Mediterranean by Di Natale and Mangano (1983, in Northridge, 1984; Di Natale and Di Sciara, 1994) and most of the sperm whales died in the Italian driftnet fishery. They suggest that this may play an important role in the mortality of sperm whales in that area. Although the number of sperm whales caught incidentally off Ecuador is unknown, the information presented here suggests that fishery interactions may also play an important role in the mortality of this species in Ecuador.

Most of the stranding records occurred in the most accessible coastal zone of the southwest and central provinces, Guayas and Manabí. It is not known whether

Table 1
Sperm whale strandings recorded on the Ecuadorian coast (1987-1994).

Site	Position	Date	Length (m)	Sex	Remarks	Source
1. Valdivia	01°56'S, 80°55'W	1987	10	?	Skull collected by a resident and brought to Montanita	This report
2. Punta Carnero	02°20'S, 80°55'W	12 Jun. 1988	11	?	Entangled in a gillnet	This report
3. Chanduy	02°25'S, 80°42'W	22 Mar. 1989	13.6	M	Caught by a tuna purse seiner and brought to the shore	Prieto & Bravo, 1991
4. Muisne	00°35'N, 80°03'W	Jun. 1990	?	?	Unknown details	<i>El Universo</i> 3 June 1990
5. Engabao	03°34'S, 80°28'W	09 May 1991	11.4	M	Entangled in a gillnet and brought to the shore to remove the net. Estimated age 12 years	This report
6. Salango	01°35'S, 80°52'W	02 Jul. 1991	10.8	M	Entangled in a gillnet	This report
7. Punta Carnero	02°20'S, 80°55'W	15 Aug. 1991	12.6	F	With the maxillaries broken	This report
8. Rio Chico	01°37'S, 80°52'W	12 Oct. 1991	11.8	F	Entangled in a gillnet. Estimated age 25-30 years	This report
9. Bahia de Caráquez	00°36'S, 80°26'W	Nov. 1991	?	?	Stranding reported to FEMM by Mr. Juan Jose Bernal	This report
10. Salinas	02°12'S, 81°00'W	Mar. 1992	3.5		Skull found on the beach	This report
11. Los Frailes	01°28'S, 80°46'W	15 Nov. 1992	11.4	M	Found stranded on the beach	This report
12. Puerto Rico	01°38'S, 80°50'W	09 Feb. 1993	8.4	F	Entangled in a gillnet	This report
13. Anconcito	02°22'S, 80°47'W	16 Jun. 1993	10	F	Entangled in a gillnet and brought to shore to remove the net	This report
14. San Vicente	00°35'S, 80°24'W	28 Oct. 1993	6.5	M	Entangled in a gillnet. Flukes were cut to remove the net. Estimated age 7-8 years	This report
15. Puerto Bolívar	03°16'S, 80°01'W	01 Dec. 1993	10.12	?	Floating 2 days in the channels near to harbour	This report
16. Sucre	00°14'S, 80°20'W	Feb. 1994	?	?	Skull found on the beach	This report
17. Las Manchas	00°45'N, 80°05'W	Apr. 1994	?	?	Skull found on the beach	This report
18. Chanduy	02°25'S, 80°42'W	17 May 1994	13.5?	M	Caught by a tuna purse seiner	Frias <i>et al.</i> , 1994
19. Briseño	00°32'S, 80°27'W	15 Aug 1994	11.6	M	Entangled in a gillnet. Estimated age 12 years	This report
20. Engabao	03°34'S, 80°28'W	04 Oct. 1994	10.11	?	Entangled in a gillnet. Estimated age 16 years	This report

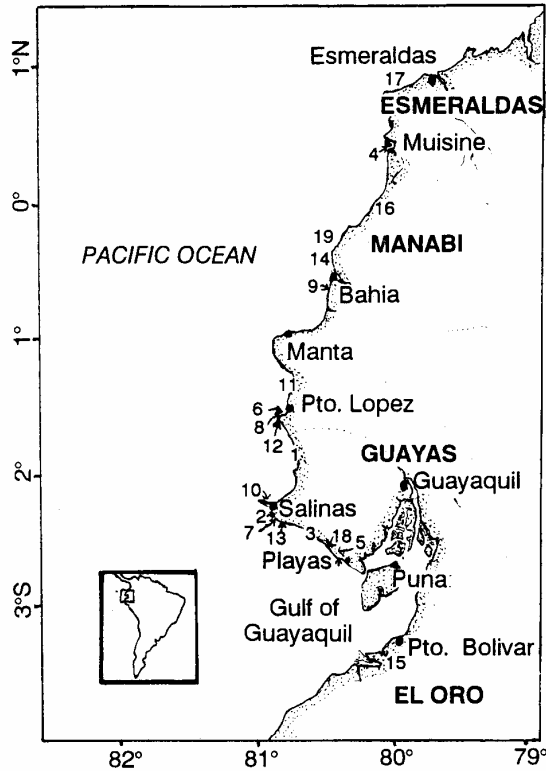


Fig. 1. Sites where sperm whale strandings occurred on the Ecuadorian coast during 1987-1994

strandings occur with the same frequency in the northernmost province, Esmeraldas. It should be noted that the use of gillnets in that area is less common (Cedeño, 1987). There are no recorded fishery interactions and/or strandings of sperm whales in the inner estuary of the Gulf of Guayaquil. This part is relatively shallow, mostly less than 100m depth and sperm whales rarely visit such shallow waters (e.g. Leatherwood and Reeves, 1983). However, north of the Gulf, where the continental platform is narrower, artisanal vessels might operate in waters where sperm whales are found. The lack of stranding records for the southern Gulf may also reflect the fact that most of its coast is covered with mangrove trees, with few beaches. The only recorded case of a dead sperm whale in that part of the Gulf (No. 15) was for an animal that did not wash ashore but rather floated for several days in the channels near Puerto Bolívar.

The incidental capture of sperm whales in the nets of artisanal fishermen represents a danger for both the whale and the fisherman. If the drifting net is not free but tied to the boat this may endanger the lives of the fishermen. For example local fishermen believe that animal no. 5 had been responsible for the loss of a launch and its crew a few days before.

Although up until now incidental catches appear to have occurred as an unwanted bycatch during normal fishing operations, it is possible that in the future things might change. In three cases it was proved that fishermen purposefully dragged the incidentally caught animals to shore in order to make some profit out of the event, either to recover the net or to sell parts of the body (e.g. teeth, meat and bones, especially the cranium). The meat and the

fat are occasionally used for bait by artisanal fishermen and by the industrial tuna fishery. The value of a sperm whale tooth has reached a high price (US\$50.00 each). It is not inconceivable that this might cause some fishermen to view this species as an alternative source of income and even lead to a 'directed' fishery, despite the fact that sperm whales are protected by law in Ecuador. The situation requires continued monitoring.

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