

A Note on Recent Strandings and Bycatches of Sperm Whales (*Physeter macrocephalus*) and Humpback Whales (*Megaptera novaeangliae*) in Ecuador

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ABSTRACT

Six out of eight sperm whales stranded on the Ecuadorian coast between December 1994 and November 1996 were found with parts of gillnets on their bodies. Stranding frequency (average of four sperm whales per year, range 2-6) has been stable over the last six years. Since August 1994, seven humpback whales have been stranded and one died incidentally in an industrial net. It is suspected, at least in the case of sperm whales, that bycatch may affect the recovery of this until recently exploited population.

KEYWORDS: STRANDINGS; BYCATCH; SPERM WHALE; HUMPBACK WHALE, AREA - ECUADOR

INTRODUCTION

Strandings of marine mammals on the Ecuadorian coast have been recorded by the Ecuadorian Foundation for the Study of Marine Mammals (FEMM) since 1987 (Chiluiza *et al.*, 1994). The sperm whale (*Physeter macrocephalus*) is the second most commonly stranded species. Haase and Félix (1994) reported 20 sperm whales stranded between 1987 and October 1994 of which 11 exhibited evidence of being incidentally killed in fisheries. Nine individuals died in artisanal drift gillnets set for sharks (mostly Sphyrnidae and Alopiidae), rays (Myliobatidae), swordfish (Xiphiidae) and marlins (Istiophoridae), and two individuals died in industrial tuna purse seine nets. According to Campbell *et al.* (1991), in 1991, 7,000 artisanal boats of various types were operating in Ecuadorian national waters, twice the number documented for 1982 (Contreras and Revelo, 1992). Sperm whale strandings as a result of bycatch have also been reported from an intensive pelagic driftnet swordfish fishery in the Mediterranean Sea (Northridge, 1984; Di Natale and Notarbartolo-di-Sciara, 1994).

Each year from June until September, humpback whales (*Megaptera novaeangliae*) visit the Ecuadorian coast to breed (Haase and Félix, 1993). The first recorded interaction

of this species with fisheries occurred in 1994, when trained whalewatching guides and fishermen reported two entangled whales near Puerto López off the central coast of Ecuador (Félix *et al.*, 1994).

This note briefly reports on new sperm whale strandings and to provide information on the first strandings of humpback whales on the Ecuadorian coast.

THE STRANDINGS

Sperm whales

Eight sperm whales were found stranded between December 1994 and November 1996 (Table 1); six reached the shore partially entangled or with clear, fresh marks of gillnets. On one occasion (No. 3) only the remains of the whale's head came ashore. In cases No's. 2 and 8, the bodies were nearly intact, but the flukes were missing. When faced with the entanglement of cetaceans in nets, it is common practice for fishermen to cut the flukes to allow easy removal from the net. In December 1995, a female and calf (No's. 9 and 10) were found entangled in the same gillnet.

The individual stranded alive at Manglaralto (No. 4) was photographed in the area (approximately 185km north) four years before on 2nd and 3rd February 1991 (J. Christal, pers.

Table 1

Sperm whale (*Physeter macrocephalus*) and humpback whale (*Megaptera novaeangliae*) strandings along the coast of Ecuador.

(Species identification, stranding information and remarks follow Geraci and Lounsbury, 1993.)

No.	Species	Location	Position	Date	Length (m)	Sex	Remarks
1	<i>M. novaeangliae</i>	Ancón	2°23'S, 80°47'W	13 Aug. 94	7.25	M	Unknown cause of death
2	<i>P. macrocephalus</i>	Engabao	2°34'S, 80°28'W	7 Dec. 94	>9.05	-	Entangled in a gillnet, tail missing
3	<i>P. macrocephalus</i>	Manglaralto	1°51'S, 80°45'W	20 Mar. 95	-	?	Remains of the head and spermaceti
4	<i>P. macrocephalus</i>	Manglaralto	1°51'S, 80°45'W	24 Mar. 95	10.4	M	Entangled in a gillnet
5	<i>M. novaeangliae</i>	Manglaralto	1°51'S, 80°45'W	14 Jul. 95	12.35	F	Deep cable cuts on pectoral fins and tailstock
6	<i>M. novaeangliae</i>	Manglaralto	1°51'S, 80°45'W	30 Aug. 95	9.40	M	Animal in decomposition
7	<i>M. novaeangliae</i>	Mar Bravo	2°13'S, 80°59'W	9 Sep. 95	6	F	Unknown cause of death
8	<i>P. macrocephalus</i>	Olón	1°50'S, 80°34'W	9 Sep. 95	>11	M	Animal in decomposition, tail missing
9	<i>P. macrocephalus</i>	Engunga	2°28'S, 80°36'W	8 Dec. 95	11.15	F	Entangled in a gillnet
10	<i>P. macrocephalus</i>	Engunga	2°28'S, 80°36'W	8 Dec. 95	5.9	M	Entangled in a gillnet
11	<i>P. macrocephalus</i>	Salinas	2°12'S, 80°59'W	20 May 96	±7	?	Entangled in a gillnet
12	<i>M. novaeangliae</i>	Tenguel	2°58'S, 79°49'W	6 Aug. 96	±14	F	Unknown cause of death
13	<i>M. novaeangliae</i>	Puerto Bolívar	3°14'S, 80°00'W	7 Aug. 96	±9	M	Tailstock and flukes missing
14	<i>M. novaeangliae</i>	Tenguel	2°58'S, 79°49'W	1 Oct. 96	-	-	Unknown cause of death
15	<i>P. macrocephalus</i>	Palmar	2°01'S, 80°44'W	24 Nov. 96	-	-	Entangled in a gillnet

comm., Memorial University, Newfoundland, Canada). The match was confirmed by the animal's natural markings on the trailing edge of the flukes.

Standard length distribution of sperm whales stranded between 1987 and 1996 ($n=23$) shows that most of the animals are sub-adult males or adult females 10-12m in length ($n=13$); although calves and two maturing males were also present (Table 1, see also Haase and Félix, 1994). The monthly distribution of the strandings since 1987 ($n=27$) shows that the animals have been caught throughout the year.

Humpback whales

The first recorded stranding of a humpback whale in Ecuador was an immature male found in 1994. Three more humpbacks were recorded in 1995 and three in 1996 (Table 1). The carcass and several bones of the pectoral fins of specimen No. 5 showed deep cuts and marks caused by cables, i.e. those used in industrial fishing gear. Approximately two months later another humpback whale (No. 6) stranded on the same beach at Manglaralto. This individual had one flipper missing, but there was no evidence of being caught in cables or nets. In September 1995, a 6m long calf (No. 7) was found at Mar Bravo without any detectable signs of a cause of death.

All three cases in 1996 (No's. 12, 13 and 14) occurred in the inner estuary of the Gulf of Guayaquil, southern Ecuador, and were separated by only 30km. The first two stranded on approximately the same date while cases No's. 12 and 14 occurred on the same beach. The flukes and the terminal part of the tailstock of No. 13 was severed; no net marks were observed.

DISCUSSION

Strandings of sperm whales along the Ecuadorian coast have continued at the same frequency since 1991, with an average of four (range 2-6) whales per year (Haase and Félix, 1994). The newly reported cases confirm that most of the strandings were bycatches from the artisanal gillnet fishery operating offshore. However, not every whale that dies as a result of such interactions reaches shore and some are likely to strand on remote sites and remain unnoticed and undocumented. Furthermore, it is not always possible to ascertain whether a fisheries interaction occurred by examining a carcass. Since there are no Ecuadorian laws that require fishermen to register marine mammal bycatches or for citizens to inform authorities about stranding events, it is difficult to know the true magnitude of the fisheries interaction.

Ecuadorian sperm whales belong to a stock of animals from northern Peru which were heavily exploited until 1983 (Ramírez, 1989; Dufault and Whitehead, 1993) and the current incidental catches may have a detrimental effect on the recovery of this population.

The occurrence of stranded humpback whales in Ecuador is new since 1994. Due to the fact that these whales frequent coastal waters in the tropics, they are more exposed to various types of fishing gear. A portion of the humpback whale strandings were caused by the pelagic purse seine fishery (e.g. No. 5 and possibly No. 13), in contrast to sperm whales, which are mainly the victims of artisanal gillnets. A possible explanation for the smaller humpback whale gillnet bycatch as compared to sperm whales, is that fishermen are setting multifilament drift gillnets further away from the coast (see Félix and Samaniego, 1994), in offshore waters where sperm whales are more commonly found.

As previously reported by Haase and Félix (1994), strandings of sperm whales during the last two years were recorded mainly on the central and southwestern parts of the coast, with four animals (two sperm whales and two humpback whales) stranded at the same site at Manglaralto and one sperm whale at Olón, 5km to the north. This concentration of strandings could be related to the fact that in this area gillnets are much more commonly deployed than in the northern half of the country where artisanal fishermen typically use long-lines (Cedeño, 1987; Campbell *et al.*, 1991). Humpback whale strandings during 1996 ($n=3$) were concentrated in the southern part of the country, inside the Gulf of Guayaquil. This estuarine zone is characterised by shallow and muddy water consisting of shorelines covered with mangroves; a habitat not known to be frequented by these animals. The exact manner in which the humpback whales stranded in these areas is unknown; however, it seems likely that the animals died at sea and the carcasses were washed ashore by currents.

Several recent studies have shown a high mortality of both small and large cetaceans in Ecuadorian artisanal gillnets (Félix and Samaniego, 1994; Haase and Félix, 1994; Van Waerebeek *et al.*, 1997), but at present the fishery authorities have not attempted to implement a survey programme to determine the magnitude of the bycatch. This would be a major undertaking because the true artisanal fishing effort is unknown. Since 1991 no updated census of the artisanal fishery has been conducted; thus, neither the number of fishermen, boats, nor the type of fishing gear used is known. But the rate of sperm whale strandings on the Ecuadorian coast seems to be directly related to the intensity of the drift gillnet fishery operating in the area. At present, no bycatch surveys have been conducted onboard industrial vessels from this country.

ACKNOWLEDGEMENTS

We would like to thank to all FEMM volunteers who helped during the fieldwork. K. Van Waerebeek (Casilla 1536, Lima 18, Peru), R. Clarke (Apartado 30, Pisco-Playa, PISCO, Peru) and two anonymous reviewers commented on the manuscript and provided valuable suggestions.

REFERENCES

- Campbell, R.J., Fallows, I., Scott, J., Ortiz, T., Rodríguez, T. and Mora, T. 1991. Una revisión del sector pesquero artesanal en el Ecuador y los factores de consideración para su desarrollo. *Boletín Científico y Técnico* 11(8):89. [In Spanish].
- Cedeño, A. 1987. Características generales de las artes de pesca artesanal en el Ecuador. pp. 23-40. In: Espol, Ceplaes and Ildis (eds.) *La Pesca Artesanal en el Ecuador*. CEPLAES, Quito, Ecuador. 288pp. [In Spanish].
- Chiluita, D., Torres, J., Aguirre, W., Félix, F. and Haase, B. 1994. Registro de varamientos de Mamíferos marinos en la costa continental ecuatoriana, período 1987-1993. Anais da 6a Reuniao de Trabalho de Especialistas em Mamíferos Aquáticos da América do Sul. Florianópolis, Brasil. 24-28 de Outubro de 1994. [Abstract]. [In Spanish].
- Contreras, S. and Revelo, W. 1992. Las pesquerías artesanales en la costa del Ecuador durante 1991. *Boletín Científico y Técnico* 12(1):1-27. [In Spanish].
- Di Natale, A. and Notarbartolo-di-Sciara, G. 1994. A review of the passive fishing nets and trap fisheries in the Mediterranean Sea and of the cetacean bycatch. *Rep. int. Whal. Commn* (special issue 15):189-202.
- Dufault, S. and Whitehead, H. 1993. Assessing the stock identity of sperm whales in the eastern equatorial Pacific. *Rep. int. Whal. Commn* 43:469-75.
- Félix, F. and Samaniego, J. 1994. Incidental catches of small cetaceans in the artisanal fisheries of Ecuador. *Rep. int. Whal. Commn* (special issue 15):475-80.

- Geraci, J.R. and Lounsbury, V.J. 1993. *Marine Mammals Ashore - A Field Guide For Strandings*. Texas A&M Sea Grant Publication, Galveston, Texas, USA. i-xi+305pp.
- Haase, B. and Félix, F. 1993. Identification of the humpback whale population along the Ecuadorian coast. Project report presented to the Whale and Dolphin Conservation Society, Bath, England (unpublished). 5pp.
- Haase, B. and Félix, F. 1994. A note on the incidental mortality of sperm whales (*Physeter macrocephalus*) in Ecuador. *Rep. int. Whal. Commn* (special issue 15):481-483.
- Northridge, S.P. 1984. World review of interactions between marine mammals and fisheries. *FAO Fish. Rep.* 251:1-190.
- Ramírez, A.P. 1989. Captura de cachalotes en Paita: 1976-1981. *Bol. Lima* 63:81-8. [In Spanish].
- Van Waerebeek, K., Van Bresseem, M.F., Félix, F., Alfaro, J., García Godos, A., Chávez, L., Ontón, K., Montes, D. and Bello, R. 1997. Mortality of dolphins and porpoises in coastal fisheries off Peru and southern Ecuador in 1994. *Biol. Conserv.* 81:43-49.