

Cetacean strandings in Costa Rica (1966-1999)

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Abstract: Cetacean strandings in Costa Rica are reported for a period of 33 years, with a total of 35 strandings, 13 species and 247 individuals involved. The vast majority of documented strandings occurred on the Pacific coast and correspond to single individuals (32 and 28 strandings respectively). The highest stranding number was in the period from 1990 to 1999 (n=24). *Physeter catodon* (cachalot or sperm whale) is the species with the highest frequency of strandings (n=8) and the family Delphinidae has the majority of species (n=8) and strandings (n=22). No other general tendencies were determined with the existing data.

Key words: Cetacea, strandings, Costa Rica.

The act of cetaceans (whales and dolphins), sirenians (manatee) and pinnipeds (seals, sea lions and their relatives) coming on to land, dead or alive, accidental or intentional, is known as a stranding (Jefferson *et al.* 1994). Several factors can cause such events.

Endoparasitic infestation (mainly those of ear and brain), viral infections, brain neural degeneration, as well as a bewildered group's guide, sick or hurt animals, calves that lost their mother, weather conditions and discontinuous or variable Earth's magnetic lines are usually listed among the most probable causes (Evans 1987, Cebrian 1995, López-Fernández *et al.* 1998, Regidor *et al.* 1998). Anthropogenic causes such as pollution, entanglements or injuries caused by ships or boats are also among the main causes of stranding (Davis *et al.* 1993). However, it is not clear which of such factors is the most common or if there is a combination of several causes. Strandings sometimes can be of hundreds of animals, most commonly in the

cases of the false orca (*Pseudorca crassidens*) and the pilot "whale" (*Globicephala* spp.) (Odell 1980, Jefferson *et al.* 1994).

Strandings are a very valuable source of biological and scientific data. They not only contribute to a better explanation of the phenomenon itself, but they also provide new information about the species involved in terms of health, population dynamics and management (Odell *et al.* 1980, Walsh *et al.* 1991, Woodhouse 1991, Mignucci-Giannoni *et al.* 1993, 1998, Goodall *et al.* 1999). The United States and Puerto Rico are among the few countries in the American Continent that have a well developed stranding network including research programs (Reynolds III and Odell 1991, Mignucci-Giannoni 1998).

Scientific attention to strandings has increased in different countries in the last decade (Pimental *et al.* 1993, Poole 1993, Mora-Pinto *et al.* 1995, Chou *et al.* 1998, Krivokhizhin and Birkun 1998, Mignucci-Giannoni 1998, Bolaños

and Villaroel 1999). However, Central American cetaceans are still poorly understood including stranding phenomena; even though it is now known that the group is highly diverse in the area, especially in Costa Rica (Huertas 1994, Rodríguez F. 1998). In November 1998, the Costa Rican Marine Mammal Rescue Network was established (*Red Costarricense de Rescate de Mamíferos Marinos-RECORMA*) providing the possibility of beginning a systematic collection and analysis of data concerning strandings.

The purpose of this paper is to report all known strandings in Costa Rica on both coasts, since the first one documented in 1966.

MATERIALS AND METHODS

Data came from different sources such as literature, local press (including photographs and videos) and unpublished data from different people and the authors. For the last ones no references are specified. Strandings information from the period of 1997 to 1999 came from field data. Based on Jefferson *et al.* (1994), when the stranding included three or more individuals, it was considered a mass stranding (Appendix 1).

RESULTS

A total of 35 strandings, involving 13 species (52% of the 25 known species for Costa Rica, Rodríguez F. 1998) and 247 individuals, are reported. Of these, 68.6% of the cases (24) belong to the decade from 1990 to 1999 (Fig. 1) and 91.4% (32) are reported for the Pacific coast. Along the Pacific coast 45.7% of the strandings (16) came from the north Pacific, 20.0% (7) from the central Pacific and 22.9% (8) from the south Pacific. Only 8.6% of the strandings were registered from the Caribbean coast.

An analysis made in terms of the Costa Rican National System of Conservation Areas (SINAC) revealed that 22.9% of the cases (8) belonged to both Osa (ACOSA) and Tempisque (ACOT) Conservation Areas, while 20.0% (7)

of the strandings occurred in the Central Pacific Conservation Area (ACOPAC), and 17.1% in Guanacaste Conservation Area (ACOGA). Only 20.0% of the strandings (7) represented mass strandings. In 14.3% of the strandings (5), species could not be determined.

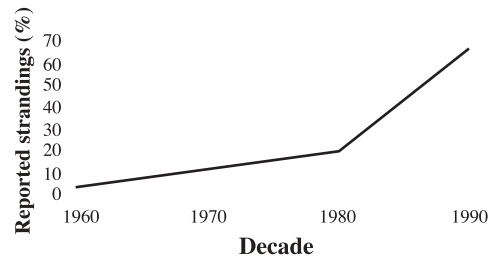


Fig. 1. Cetaceans stranding records by decade in Costa Rica, from 1966 to 1999.

On the other hand, 88.6% (31) of the strandings were from odontocetes (toothed “whales”) and 8.6% (3) from mysticetes (baleen or true whales). Of the four families of cetaceans known for the country, the one that accounted more for both species and strandings was Delphinidae with 61.5% (8) and 62.9% (17) respectively, and only Ziphiidae had no cases at all (Fig. 2).

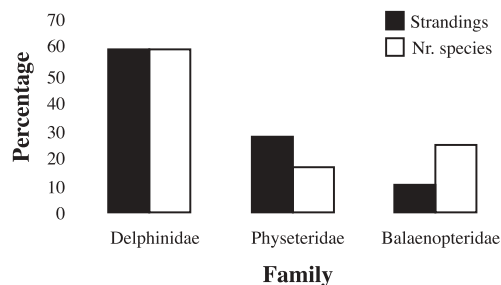


Fig. 2. Cetacean strandings in Costa Rica and species frequency by family, from 1966 to 1999.

The species with the greatest numbers of strandings was *Physeter catodon* (cachalot, sperm “whale”) with 22.9% (8) of the cases, all of them being single ones. A mass stranding of great proportions was reported for

Peponocephala electra (“ballena” cabeza de melón, melon headed “whale”), with more than 200 animals stranded at Playa Tambor (Península de Nicoya, North Pacific) in 1976 (Janzen and Wilson 1983).

DISCUSSION

Composition of stranded species along Costa Rican coasts is ecologically heterogeneous. *Stenella coeruleoalba* (striped dolphin), *Globicephala macrorhynchus* (pilot “whale”), *Tursiops truncatus*, *Stenella longirostris* (spinner dolphin), *Physeter catodon* and *Balaenoptera edeni* (Bryde’s whale) are common species. *Orcinus orca* (orca, “killer whale”) is an uncommon species (although reports of these species have increased in the last few years) and *Balaenoptera physalus* (fin whale) is very rare. On the other hand, there are no stranding records of very common species in inshore waters, such as *Delphinus delphis* (common dolphin) and *Grampus griseus* (Risso’s dolphin) and *Pseudorca crassidens* (false “killer whale”). Species that are common in Costa Rican waters (Rodríguez F. 1998) as well as common as stranding species in other areas, such as *Pseudorca crassidens* and *Ziphius cavirostris* (Cuvier’s beaked “whale”) (Jefferson *et al.* 1993, Mignucci-Giannoni 1998, Rosario-Delestre 1999), are not registered either.

Of all the strandings of *P. catodon* most individuals (87.5%) did not exceed 12 m in length. This is consistent with the prevalence of females, calves and juveniles of this species in tropical waters (Evans 1987).

The stranding of a calf of *B. physalus* in 1995 became the first known record in the country for a baleen whale, while the stranding of *Megaptera novaeangliae* was the first record from the Pacific coast of Costa Rica. In general, strandings of balenopterid whales are uncommon (Klinowska 1989). The stranding of a male *Stenella coeruleoalba* in Puntarenas was the first attempt to rehabilitate a stranded marine mammal in Costa Rica (Appendix 1).

There was not enough data to determine general tendencies of strandings with respect to time of year, kind of coastal habitat, age, sex or size. Even though the number of stranded animals with net remains was low (3 cases) it is important to study the real impact of interactions between cetaceans and fisheries along the coastal areas. Palacios and Gerrodette (1996) estimated an annual mortality of 16 000 dolphins due to fisheries related activities.

The beginning of a systematic program for monitoring strandings and entanglements, as is the case of RECORMA, is a basic step to establish a network for the whole country and to provide a better panorama for research, management and educational policies regarding marine mammals in Costa Rica.

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de Costa Rica) made the final review of the manuscript.

RESUMEN

Se informan los casos de encallamientos de cetáceos en Costa Rica. Un total de 35 casos conocidos para 13 especies involucradas y un total de 247 individuos. La gran mayoría de los casos provienen de la costa Pacífica (32) y 28 corresponden a encallamientos individuales. El cachalote, *Physeter catodon*, es la especie con mayor frecuencia de encallamientos (8) y la familia Delphinidae abarca la mayor cantidad de especies involucradas (8) y de casos de encallamientos (22). No se determinó ninguna otra tendencia general con la información disponible.

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Appendix 1. Cetacean strandings in Costa Rica 1966-1999

Delphinidae

Orcinus orca (orca)

1993: Playa Llorona, Península de Osa (South Pacific). 3 individuals, all died (M. Montoya pers. comm.)

Globicephala macrorhynchus (ballenato, pilot "whale")

1995: Playa Ostional (North Pacific). 1 female (released), 1 male (died), 1 calf (released) (J. Ballesteros pers. comm.)

Peponocephala electra

1970: North Pacific. 1 individual (D. Robinson pers. comm.)

1970: North Pacific. 1 individual (D. Robinson pers. comm.)

1976: Playa Tambor, Península de Nicoya (North Pacific). +200 individuals, ~80 died (Janzen and Wilson 1983, Huertas 1994)

Sotalia fluviatilis (tucuxi)

1997: Playa Manzanillo (South Atlantic). 1 individual, died (C. López pers. comm.)

Tursiops truncatus (buefo, bottlenose dolphin)

1986: Punta Morales, Golfo de Nicoya (North Pacific). 1 individual, died (J.A. Vargas pers. comm.)

1997: Playa Zancudo, Golfo Dulce (South Pacific). 1 individual, net remains; died (O. Arias pers. comm.)

1998: Playa Rincón, Golfo Dulce (South Pacific). 1 individual, died (C. Ovares pers. comm.)

1998: Golfo Dulce (South Pacific). 1 individual

1998: Puerto Quepos (Central Pacific). 1 female 2.75 m long, died because of pulmonary infection.

1998: Playa Palma, Parrita (Central Pacific). 1 individual, died (A. Vega pers. comm.)

1999: Playa Sirena, Osa (South Pacific). 1 individual (J. Börner, pers. comm.)

Appendix 1. Cetacean strandings in Costa Rica 1966-1999 (Cont.)

Stenella attenuata (delfín manchado, spotted dolphin)

1998: Playa Flamingo, Bahía Potrero (North Pacific). 1 juvenile (J. Börner pers. comm.)
 1999: Playa Jacó, Puntarenas (Central Pacific). 1 female. All individual collected. Blood clots in the lungs.
 Viral origin. Two others went back to the sea.

Stenella longirostris (delfín tornillo, spinner dolphin)

1999: Puntarenas, Golfo de Nicoya (North Pacific). 1 individual, 1.5 m; bruises on the belly; died (W.Flores pers. comm.)

Stenella coeruleoalba (delfín rayado)

1999: Playa Leona, Golfo Dulce (South Pacific). 1 individual, propeler injuries; released (A. Rodríguez pers.comm.)
 1999: Puntarenas. 1 individual. Male, alive. Received treatment during 5 days until he died. Blood clots in the lungs, viral origin.
 1999: San Isidro, Puntarenas. 1 individual. Dead. Skull was collected.

Physeteridae

Physeter catodon (cachalote, sperm "whale")

1966: Playa del Coco, Papagayo (North Pacific). 1 individual, skull 2m long (D.Robinson pers. comm.)
 1986: Playa Sierpe (South Pacific). 1 individual, 13 m long, died (J. Mora 1986)
 1987: Playa Palma, Parrita (Central Pacific). 1 individual, 12 m long, died (La Nación 1987).
 1987: Caldera, Golfo de Nicoya (North Pacific). 1 individual, 9.6 m long, died.
 1988: Playa Potrero, Bahía Potrero (North Pacific). 1 individual 10 m long, died.
 1991: Península de Santa Elena (North Pacific). 1 individual 8.9 m long, died (R. Tiffer pers. comm.)
 1995: Moín, Limón (Central Caribbean). 1 individual (J. Arce, pers.comm.)
 1997: Chomes, Golfo de Nicoya (North Pacific). 1 individual 8 m long with net remains, released.

Kogia simus (cachalote pigmeo, pigmy sperm "whale")

1993: Pacific Coast, six individuals (Huertas 1994)

Balaenopteridae

Balaenoptera physalus (ballena, fin whale)

1995: Playa Tortuguero (North Atlantic). 1 individual (calf) 8.9 m long, died (G. Moya pers. comm.)

Balaenopteridae

B. edeni (ballena, Bryde's whale)

1999: Playa Bandera, Parrita (Central Pacific). 1 female, 14 m long; died.

Megaptera novaengliae (ballena, humpback whale)

1998: Playa Flamingo, Bahía Potrero (Pacífico Norte). 1 calf, died (R. Hernández pers. comm.)

Unidentified

1983: Bahía Santa Elena (North Pacific). Whale 12 m long, died (La Nación 1983).
 1997: Playa Esterillos (Central Pacific). 7 dolphins, net remains.
 1999: Playa Manuel Antonio (Central Pacific). 2 dead dolphins, the tide brought the animals back to the sea (S. Wofford pers.com.)