

Three remarkable strandings in the last 10 years in the Pacific of Costa Rica (Eastern Tropical Pacific)

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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, lungs 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 (Odell 1980, Evans 1987, Cebrian 1995, López-Fernández *et al.* 1998, Regidor *et al.* 1998). Anthropogenic causes such as pollution, entanglements or injuries caused by collisions with ships and boats are also of key importance in causing strandings (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 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, particularly in Costa Rica (Huertas 1994, Rodríguez-Fonseca 2001, May *et al.* 2005). 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.

Methodology

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.

Results

Balaenoptera borealis (Sei whale). May, 2001. An adult of unidentified sex (probably a female because of its size), Adulto de sexo no identificado (probablemente una hembra), of 18 m in length. In Papaturo Beach, Salinas Bay, Guanacaste Province (Northwestern Pacific). In sandy beach.

Beached around 6 am, it died close to 12:00 m. The skin below was scraped and there were several balanus of the genus *Xenobalanus* (Crustacea: Cirripedia: Balanomorpha) attached to the dorsal fin. No cause of death could be determined. Including the one reported here, there are 13 strandings of this whales reported worldwide in the available information. Ten are from the North Atlantic basin (7 in the American Continent and 3 in Europe), 2 from the Eastern Pacific and one from the Indian Ocean (in India). This is the first reported in the Eastern Tropical Pacific where this species is very rare (never have been seen in more than 30 years of cruises of the SWFSC/NOAA ships and the stranding itself can be consider extraordinary (Robert Pitman, *com. pers.* 2009). The closest known stranding to the one described here is Chile and this one seems to be the second in the whole Eastern Pacific. Acknowledgements to María Marta Chavarría (Guanacaste Conservation Area, National System of Conservation Areas-SINAC, Ministry of the Environment, Energy and Telecommunications-MINAET) for some general information and to Daniel Pérez for the photographs.



Steno bredanensis (rough-toothed dolphin). April, 2002. A massive stranding of great proportions, 38 dolphins in Cedros Beach (Cóbano, Nicoya Peninsula, Puntarenas Province), in the southernmost portion of the Northern Pacific. Sandy and rocky beach. 34 individuals were successfully turn back to the sea (neighboring beaches were monitored during a week and the dolphins did not beach again) with the help of authorities, local people and tourists. Four dolphins died, one dissapeared and the other three were necropsied. The lungs were completely clear and pink and the stomachs were full of food (mainly fish). The tissue samples examination posteriorly confirmed the animals were healthy. Unfortunately, it was not possible to make chemical contaminants analysis. One skull was collected. Though not conclusive, but the mass stranding could have been provoked by a disoriented leader of the group. Is the second most massive stranding registered in Costa Rica and the biggest in recent times. There are no previous, neither single nor massive strandings of this species in the country and only one in the Pacific coast of the American Continent (Gulf of California, México). Of the available information and including the one described here, 12 strandings of this species have been reported since 1976, ranging from 1 to 69 individuals (in Florida), being the one reported here the second in the number of individuals stranded. All come from the American Continent, mostly from the North Atlantic coast (9/12). Acknowledgements to more than 300 people from the towns of Montezuma and Cabuya, as well as authorities and tourists that voluntarily help to save the dolphins. Also to Lara Anderson (Tempisque Conservation Area, National System of Conservation Areas-SINAC, Ministry of the Environment, Energy and Telecommunications-MINAET) for her unvaluable logistical support and also involvement with her personel in helping the animals.

Lagenodelphis hosei (Frazer's dolphin). May 24th 2006. Two individuals, an adult female. 2.30 m in lenght, 1.15 m girth and a calf. Dominicalito Beach (Northern South Pacific, Puntarenas Province). The female had a bloody hurt in the beak.

June 10, 2006. 8:40 am. An adult of unidentified sex, 2.14 m length. Playa Dominical, Osa Conservation Area (South Pacific, Puntarenas Province). It showed blood in one eye and the blowhole seemed to be bruised, the rest of the body skin was fine. Hind flippers 14 cms length, dorsal fin 27 cms tall and the tail 47 cms width. Acknowledgments to the Navy of Golfito (Servicio nacional de Guardacostas) for helping to bury the animals and to Fressia Godinez Vega for the pictures taken. Fraser's dolphins seems to be common in strandings all along the Atlantic Coast, from Argentina Uruguay and Brazil to the Northern Gulf of California and up to Maine in the United States, as well as in Puerto Rico in the Caribbean for the American Continent, and from Angola to France and England in Africa and Europe. There are also a few strandings reported from Australia. However, according with the available information, the strandings described here are the first of *Lagenodelphis hosei* reported in the Pacific of the American Continent.

Conclusions

The strandings reported here are still the only known in the country for the three species, therefore can be consider as exceptional ones (moreover if compared with the frequency of strandings in the country of striped, bottlenose and spotted dolphins or sperm whales). The three species seem to strand frequently in the Atlantic Ocean but rarely elsewhere. However, it should be also considered that perhaps there are more organized and well developed stranding networks in the Atlantic Coast. Nonetheless, rough toothed dolphins is a common species in along the Exclusive Economic Zone (EEZ) of Costa Rica, while Fraser's dolphin is uncommon and Sei whale very rare (one reported sighting at sea, relatively near Coco's Islad).

Even though there were injuries in the animals in the three cases, they were more likely to be caused during the process of stranding in the beach (hitting with rocks, scrapping with the sand, etc.). It was not possible to determine any direct cause of death of human origin y any of the three events. It is also of importance to highlight the importance of networks connected with local people who can help lots in taking data, photographs and preliminary attending the stranded animal(s).

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