

Collisions between ships and whales in the Canary Islands. The case of Tenerife.

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The monitoring and study of the stranded cetaceans in the Canary Islands has been carried out in a systematic manner since 1991, when the stranding of two specimens of sperm whale *Physeter macrocephalus* was reported for the first time. The animals were two adult females with the bodies divided in halves, similar to another collision occurred in 1985 (Martín y Carrillo 1992). As a consequence of the social alarm that the collisions between the small fast ferries (jet-foil) and cetaceans caused, in 1993, the University of Las Palmas de Gran Canaria (ULPGC) was introduced to the research, with the financial support of the Transmediterranea Company, in order to determine the migratory patterns of the big whales in the Canary Islands. The results confirmed that the waters near the port of Santa Cruz de Tenerife are a high density area of cetaceans, emphasizing the presence of a resident population of sperm whale (André, M. 1998). However, the research provided little information about the distribution and seasonality of the sightings.

From 1999, coinciding with an increase of shipping traffic and the development of newer faster vessels, the situation changed remarkably. A notable increase of stranded cetaceans with clear signs of ship strikes has been reported (Aguilar *et al.* 2000, 2001, Herrera *et al.* 2000). To this regard and with the aim to identify the potential risk of the collisions, a model of risk for the high shipping traffic areas in Tenerife was developed (Tregenza *et al.* 2000, 2002) as well as general tables for collisions for all the Canary Islands (Government of Canary Islands, ULPGC, Tenerife Conservation and SECAC 2009). The analysis of the different stranded animals clearly confirms that the most affected species by ship strikes is the sperm whale (Carrillo & Tejedor, 2006; De Stefanis & Urquiola 2006; Carrillo, M. 2007; Carrillo & Ritter 2008).

Complementary to the analysis of the collisions between vessels and cetaceans, we also go through all the mortality factors and the seasonality of 284 records of stranded cetacean in Tenerife, the island in the Canary's were not only most cases of stranded animals but also ship strikes are reported (Arbelo, M. 2007). The analysis of the stranded cetaceans during the period from 1991 to July 2010 shows that in 103 of the cases (36.3%) no signs of anthropogenic interactions were found, reporting these deaths as a natural factor. In 70 of the cases (24.6%) wounds, fractures, net marks, fishing devices or anomalous stomach contents (plastics) were observed, which could be associated to the death of the animal, thus, the mortality factor is related to anthropogenic interaction. In 111 of the cases (39.1%) the mortality factor has been classified as undetermined due to the difficulty to examine the specimens or as a consequence of the high level of decomposition.

From the 70 cases of the specimens classified with a mortality factor of anthropogenic interaction, 43 of them showed serious injuries, massive traumas, fractures of hard bones or bodies divided in halves. These animals show clear signs of collision and have been reported as due to shipping traffic mortality factor. This represents 61.4% of the cases of anthropogenic interactions and 15.1% of all cases of stranded cetaceans in the island of Tenerife. The annual distribution of the different cases shows that until 1998, when jet-foils began to appear, 0.6 cases of collision were registered every year and from thereon (to present), the average has increased to 3.1 cases every year. Although cases are registered all year round, seasonality shows that the majority of collisions occur between June and July, with 8 cases registered in both months. In terms of affected species by ship strikes, at least 7 species have been reported: sperm whale (*P. macrocephalus*), short fin pilot whale (*Globicephala macrorhynchus*), pygmy sperm whale (*Kogia breviceps*), dwarf sperm whale (*Kogia simus*), Cuvier's beaked whale (*Ziphius cavirostris*), Gervais's beaked whale (*Mesoplodon europaeus*) and fin whale (*Balaenoptera physalus*). The sperm whale, with 21 registered cases, is the most affected species and represents a 48.8% of the total cases of collision in the island of Tenerife. Furthermore, the sperm whale is listed as vulnerable in the Catalogo Nacional de Especies Amenazadas and in the IUCN Red List of Threatened Species (CNEA 1990, IUCN 2010). However, differently to other places where collisions are well documented (NMFS 2007; Tejedor *et al.*, 2007), in Canary Islands nothing has been done to date in order to minimize the risk of ship strikes

In order to better protect this species, it is essential to address and mitigate those human activities that result in mortality. In 2007, Tenerife Conservation carried out a revision of the available data of sightings, stranded cetacean and threat factors of the protected species of cetacean in the Canary's and developed a report for the government of the Canary Islands with the aim to establish a conservation plan for the sperm whale. Therefore, we propose the following measures:

- To determine the distribution and estimate the size of the population of sperm whale and other cetacean in the areas of high vessel traffic (Tenerife-Gran Canaria and Tenerife-La Gomera, Red Natura 2000), in order to establish the relative probability of vessel and cetacean encounter.
- The placement of dedicated on board observers (look-outs) on all fast and high speed vessels.
- Experimental on-board application of technical mitigation measures to test their feasibility and effectiveness.

- The introduction of a mandatory reporting scheme for collisions, thereby making use of the database being developed by the IWC Vessel Strike Data Standardisation Group (Van Waerebeek and Leaper, 2007).
- To propose to the vessel operators and crew an immediate recommendation to avoid causing injury or death to cetacean.
- It would be also important to improve the monitoring of floating dead cetacean that occasionally would not be recovered and might be cases of ship strikes.

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