Analysis of cetacean strandings along the Italian coastline in the years 1986-2004

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ABSTRACT
The authors report a summary of the cetacean strandings, bycatches and ship collisions occurred in Italy between 1986 and 2004.
Tha data presented and analysed have been collected mainly by the Centro Studi Cetacei (Center for Cetacean Studies) based at the Museum of Natural History of Milan. An annual report is published with a list of the animals found dead on the coast or at sea, found entangled in fishing nets or sighted in distress close to shore.
At the same time, since its foundation in the 1988, another no-profit Organization, the Fondazione Cetacea, worked in cooperation with CSC to rescue cetaceans stranded alive along the Italian coasts of the Adriatic Sea.
Furthermore, a Mediterranean Marine Mammal Tissue Bank has been recently established (2002) at the Department of Experimental Veterinary Science of the University of Padua, Faculty of Veterinary Medicine.
A total of 3341 animals have been reported during the years 1986-2004. Stranded animals included 14 species belonging to 4 families; 761 specimens remained unidentified.

KEYWORDS: Mediterranean, Italy, strandings, bycatches, ship collisions.

Aim of this paper is to present a summary of the data concerning cetacean strandings along the Italian coastline. We also report sightings of dead animals at sea, while identification of live individuals or schools is outside the scope of the present short note.

Origin and activities of the Italian stranding networks

Since the second half of the XIX century, scientists belonging to the Museums of Natural History of Milan, Genoa and a few other towns systematically started to collect skulls and skeletons from cetaceans stranded along the Italian coastline. At the end of the 70's, some individuals and Institutions began also to collect and classify data and tissues from cetaceans stranded along the Italian coastline (Progetto Cetacei). In 1986, a group of zoologists dedicated to cetacean science established the Centro Studi Cetacei (CSC, Center for Cetacean Studies), hosted by the Italian Society for Natural Science and based at the Museum of Natural History of Milan. The CSC organized the first nation-wide stranding network. It also brought together Italian investigators dedicated to dolphin and whale science and promoted their researches. The stranding network was based on the cooperation of many single individuals and Institutions. Data were and still are forwarded to the central coordination site in Milan, at the Museum of Natural History where they are filed and subsequently listed in yearly reports published in the scientific journal of the Italian Society for Natural Sciences (*Atti della Società Italiana di Scienze Naturali e del Museo civico di Storia Naturale di Milano*). The annual report lists by species the animals found dead on the coast or at sea, found entangled in fishing nets or sighted in distress close to shore. Bycatches and ship collisions are enclosed in the list.
At the same time, since its foundation in the 1988, another no-profit Organization, the Fondazione Cetacea *onlus*, worked in cooperation with CSC to rescue cetaceans stranded alive along the Italian coasts of the Adriatic Sea. The Foundation worked on more than 30 cases of live strandings that

have often required hospitalization in a rehabilitation center. Dead animals were also studied and their skulls or skeletons preserved for scientific purposes.
Furthermore, a Mediterranean Marine Mammal Tissue Bank has been recently established (2002) at the Department of Experimental Veterinary Science of the University of Padua, Faculty of Veterinary Medicine (web site http://www.sperivet.unipd.it/tissuebank/index.html - a new web site is in progress). Ideally most of the specimens stranded along the Italian coasts eventually will be represented in the Bank allowing researchers from all over the world to access these samples.
Nowaday several scientific Institutions in Italy study the samples collected from stranded specimens. The main research fields include: Levels of organochlorines and heavy metals in different tissues; Accumulation and detoxification systems of mercury; Bacterial and viral infections; Enzymatic systems; Parasites; Age determination; Diet; Histo-physiology of the digestive apparatus; Effects of pressure on the body; Osteology.
Presently, over 400 complete skeletons and more than 200 cetacean skulls have been collected resulting in a big increase of the total number of specimens held in local Museums of Natural History.

Data collected during the years 1986-2004
Table 1 summarizes data on cetacean stranded along the Italian coastline during the years 1986-2004. A total of 3341 animals have been reported during the years 1986-2004. Stranded animals included 14 species belonging to 4 families; 761 specimens remained unidentified.

Table 1. Cetaceans stranded in Italy 1986-2004

Scientific name	Common name	Number of specimens
Balaenoptera physalus	Fin whale	60
Balaenoptera acutorostrata	Minke whale	4
Megaptera novaeangliae	Humpback whale	1
Physeter macrocephalus	Sperm whale	125
Kogia sima	Dwarf sperm whale	2
Ziphius cavirostris	Cuvier's beaked whale	51
Mesoplodon europaeus	Gervais' beaked whale	1
Pseudorca crassidens	False killer whale	3
Globicephala melas	Long-finned pilot whale	49
Grampus griseus	Risso's dolphin	120
Steno bredanensis	Rough-toothed dolphin	6
Tursiops truncatus	Bottlenose dolphin	656
Delphinus delphis	Short-beaked common dolphin	33
Stenella coeruleoalba	Striped dolphin	1469
Unidentified cetaceans		761
Total		**3341**

Strandings of toothed-whales have always been more frequent than those of baleen-whales, and, among the former, small dolphins constitute the vast majority of the animals. Striped dolphins (*Stenella coeruleoalba*) were the most abundant species and account for 57% of the determined (or 44% of the total) cetaceans, followed by bottlenose dolphins (*Tursiops truncatus*). The high number of sperm whales (*Physeter macrocephalus*) is partly related to by-catch mortality. Analysis of the stranded specimens gave the opportunity to report species uncommon or even unknown before in the Mediterranean waters. Species such as rough-toothed dolphin (*Steno bredanensis),* dwarf sperm whale (*Kogia sima),* Gervais' beaked whale *(Mesoplodon europaeus)* and humpback whale *(Megaptera novaeangliae)*, were previously considered rare or absent from the area, until recent reports.

Figure 1 shows the yearly distribution of the total number of cetacean strandings, by-catches and ship-strikes for the three commonest species. The striped dolphin morbilliviral die-off of 1991 is evident with a peak of dead animals far higher than in previous or later years. By-catches represent 18% of the total data, 34% of which took place in the years 1988 and 1989, in connection with the use of the pelagic drifting nets.
Strandings were not evenly distributed temporally during the year, with a peak occurring in the late spring and summer periods. This observation may be partly related to the higher human presence along the coasts during those seasons, resulting in an increased awareness of stranding situations.
The geographical distribution of the strandings somehow reflects the exposure of the coasts, but any further consideration should also take in account that the efficiency of the recovery teams were sometimes a key factor for harvesting data.
Mortality due to interactions with human activities (Human Induced Mortality – HIM), ship-strikes or the influence of pollutants on cetacean health in Italian waters are described in other papers presented at this very same IWC venue and will not be discussed here.

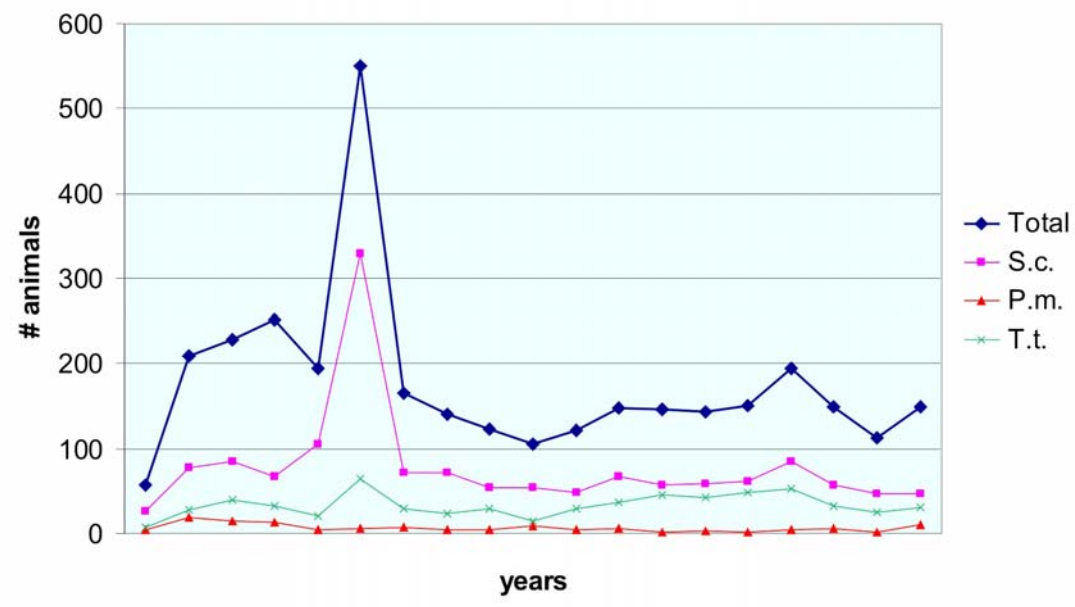

Fig. 1 Yearly distribution of cetacean strandings in Italy: 1986-2004.
S.c.: *Stenella coeruleoalba*; P.m.: *Physeter macrocephalus*; T.t.: *Tursiops truncatus*

Future perspectives
A recent research project approved by the Italian Ministry of Environment will allow in the next future centralized collection and validation of data from strandings, based at the CIBRA (Italian Multidisciplinar Center for Bioacustic and Environmental Research) of the University of Pavia in cooperation with the Museum of Natural History of Milan.

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