

What causes whales, dolphins and porpoises to strand around the UK coast?

Marine Objective Theme: State of the Marine Environment

What's the problem?

For centuries, cetaceans (whales, dolphins and porpoises) have regularly stranded around the coasts of the UK. The underlying causes of these stranding events are not always clear and in particular, the role that human activity may play in either directly or indirectly causing strandings remains controversial. Information generated on stranded animals can provide a picture of what species are found in UK waters. In addition, strandings that undergo post-mortem examination can also provide unique insights into causes of death, diseases, environmental contaminant levels, reproductive patterns, diet and other aspects of the general health of cetacean populations in UK waters, which would be largely inaccessible through other methods. This provides important baseline data to help detect any future outbreaks of disease, unusual mortality events or responses to environmental change (e.g. climate change).

What were the aims of the project?

Since 1990, the collaborative UK Cetacean Strandings Investigation Programme (CSIP) has been funded by UK government and also recently by the devolved administrations, to record all strandings of cetaceans around the UK coast and to retrieve a proportion for investigation at post-mortem. Data on UK stranded marine turtles and basking sharks are now also being collected under the project. The project aims were to:

- provide a systematic and coordinated approach to the surveillance of cetacean strandings in the UK and to the investigation of causes of death
- collate, analyse and report data for all cetacean strandings around the coast of the UK
- determine the causes of death in 100 stranded cetaceans each year
- undertake surveillance on the incidence of disease in stranded cetaceans in order to identify any substantial new threats to their conservation status.

It was also tasked with the development and population of an integrated database bringing together accurate and geo-referenced information on both strandings and post-mortem data, allowing end users to interrogate this data via the internet. A national cetacean tissue archive was also maintained and provided a useful resource for scientific research. This project commenced in April 2007 and ran until March 2011.



Figure 1. Humpback whale found dead in River Thames, 2009 (Image: Matt Perkins, CSIP/ZSL)

Which policy areas has the research informed?

The information from this project has helped to ensure that the UK complied with a number of national and international directives/agreements, including the Habitats Directive, Marine Strategy Framework Directive (MSFD) and the Agreement on the Conservation of Small Cetaceans in the Baltic and North Sea (ASCOBANS). The data generated by the CSIP also facilitates informed management decisions to improve or maintain favourable conservation status in threatened species, through the investigation of important causes of death such as accidental entrapment in commercial fishing gear (by-catch).

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What were the results from the project and how will they be used?

Between 1st January 2005 and 31st December 2010 (covering contract numbers CR0346 and CR0364), the CSIP received reports of 3430 cetaceans, 76 marine turtles and 27 basking sharks. The largest number of cetacean reports was received in England (n=1650), with smaller numbers in Scotland (n=996), Wales (n=709), Northern Ireland (n=46), the Isle of Man (n=20) and the Channel Islands (n=nine). The total number of cetacean strandings reported to the CSIP during 2006-2010 declined by approximately 22% relative to the preceding five year period (2001-2005). This decline was largely driven by a reduction in reported strandings of harbour porpoises (*Phocoena phocoena*) in most regions of the UK and also of short-beaked common dolphins (*Delphinus delphis*) in south-west UK. Between 2005-2010, 752 post-mortem examinations of 15 cetacean species (mainly harbour porpoises and common dolphins) were conducted. The principal causes of death in 478 UK-stranded harbour porpoises examined at post-mortem between 2005 and 2010 were infectious disease (n=120), starvation (n=117), attack by bottlenose dolphins (*Tursiops truncatus*) (n=79) and entanglement in fishing gear (by-catch) (n=71). The principal causes of death in 129 common dolphins during the same period were by-catch (n=46) and live stranding (n=37). In addition, post-mortem examinations were also carried out on 22 marine turtles and three basking sharks between 2005 and 2010. An analysis of post-mortem examinations conducted by the CSIP between 1991 and 2010, showed a slight decline in the proportion of by-catch in UK stranded harbour porpoises and common dolphins and a relative increase in the proportion of infectious disease and starvation in harbour porpoises.

On 9th June 2008 the UK's largest common dolphin mass stranding event occurred in Cornwall, during which 26 died. A detailed investigation was conducted under a variation to contract, with funding provided by Defra. The CSIP, together with CEFAS, has generated one of the worlds largest time-series datasets on chemical pollutants in a marine mammal species (the harbour porpoise). The dataset showed that some organochlorine pesticide and trace metal contaminants have declined over time since 1990. However, polychlorinated biphenyl (PCB) levels have been stable since 1997 in UK stranded harbour porpoises and still occur at much higher concentrations than other

marine contaminants tested. PCB levels in UK stranded bottlenose dolphins and killer whales (*Orcinus orca*) are extremely high (Fig 2) and may pose a major but largely unquantified conservation threat to these marine top predators. Between 2005 and 2010, 69 peer-reviewed publications covering a wide range of research themes were published, using CSIP generated data or samples held in the national tissue archive. A fully integrated web accessed CSIP database was created in 2008 and periodic export to the NBN gateway (www.nbn.org.uk) now takes place, enabling access to data on strandings by the wider public. The research of the CSIP has improved our knowledge of cetaceans, informed the public about the reasons for strandings and shaped policy decisions at a national and international level, which should ultimately help to improve the overall conservation status of cetaceans in UK waters.

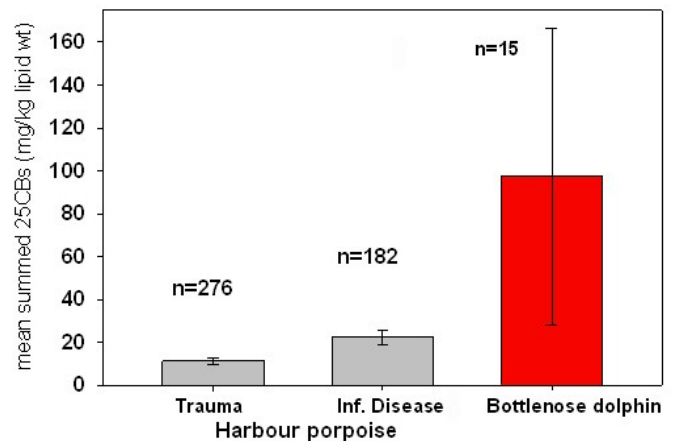


Figure 2. Comparison of mean summed 25CBs concentrations in UK-stranded harbour porpoises (trauma and infectious disease cases) and bottlenose dolphins (1991-2005). Bars=2SE

Where can I find further information about this and related research?

The Institute of Zoology leads the consortium of partner organisations (Scottish Agricultural College- Inverness, Natural History Museum and Marine Environmental Monitoring) making up the CSIP. JNCC also provide day-to-day project management oversight. Further information can be found at www.ukstrandings.org



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