Agenda Item 5.3

Implementation of the ASCOBANS Triennial Work Plan (2007-2009)

Review of New Information on Bycatch and Other Causes of Mortality

Document 60

By-catch of harbour porpoises (*Phocoena phocoena*) in the Baltic coastal waters of Angeln and Schwansen (Schleswig-Holstein, Germany)

Action Requested

- Take note of the information submitted
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Germany

By-catch of harbour porpoises (*Phocoena phocoena*) in the Baltic coastal waters of Angeln and Schwansen (Schleswig-Holstein, Germany)

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Abstract

A dramatic increase in stranding numbers of harbour porpoise carcasses along the German Baltic coast since the year 2000 is reason for concern. By-catch has been identified as the main threat to harbour porpoises in the ASCOBANS area. A subset of German Baltic Sea strandings has been examined for net marks and cuts as indication for unreported by-catch. Data from 152 stranded carcasses and 95 reported by-catches along the Angeln and Schwansen coast form the basis for calculations of the proportion of by-caught animals. Over all years, this proportion was 86.5 % of stranded carcasses and reported by-caught animals. From 1987 to 2000 the number of reported by-catch predominated the sample whereas from 2001 on most by-catches remained unreported. In the German part of the Baltic Sea, annual by-catch rates for the years 2005 to 2007 were between 2.7 % and 7.8 % of the median abundance estimate from 10 surveys in this area between 2003 and 2006. The result of this study shows that the reported by-catch represents only a minimum estimate which is not suitable as a data basis for management purposes.

Introduction

During the 20th century, numbers of harbour porpoises in the Baltic Sea have declined and the distribution range narrowed (Koschinski 2002). This probably was initiated in the last half of the 19th century when heavy direct takes may have led to an overexploitation (Kinze 1995). Later, by-catch at possibly unsustainable levels, contaminants and overfishing of prey species have been identified as likely threats (Koschinski 2002). There is indication for a continuing decline of porpoise stocks. Teilmann et al. (2008) state that a 38 – 51 % decline in the western Baltic population between 1994 and 2005 should give reason for concern although data are not statistically significant due to large confidence intervals. This is especially true if one considers a dramatic increase of strandings of harbour porpoise carcasses along the German Baltic coast since the year 2000 (Fig. 1) for which the reason is so far unknown.

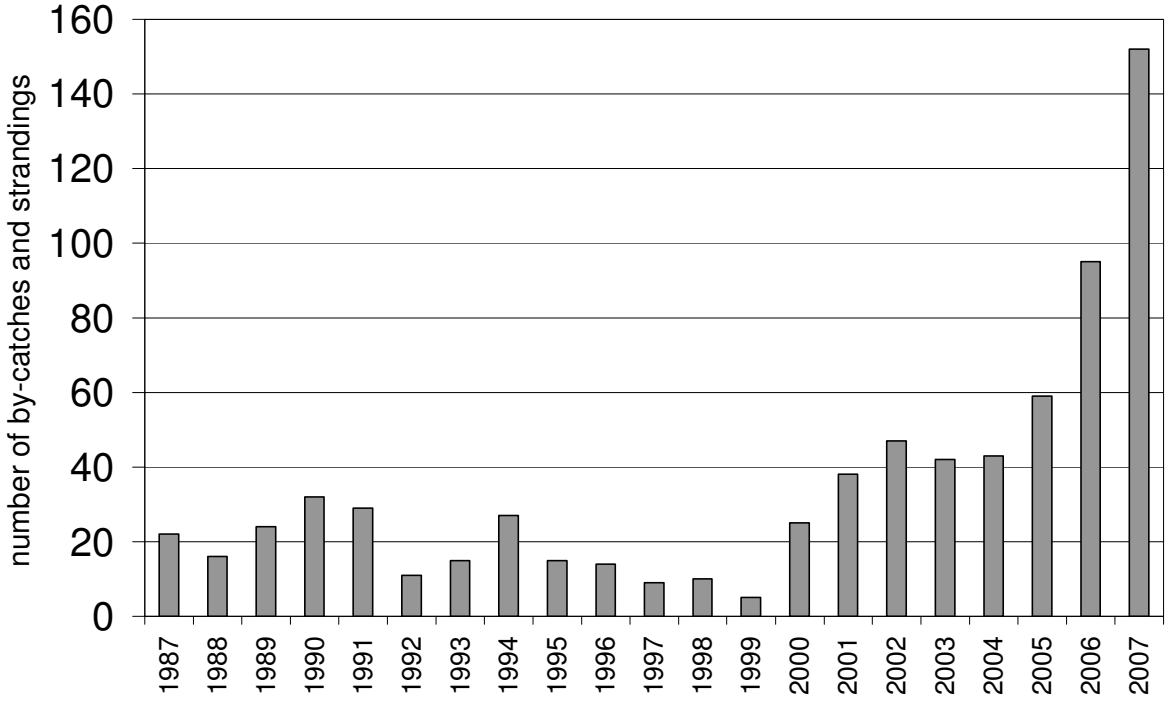

Fig. 1. strandings of harbour porpoise carcasses and by-catches along the German Baltic coast for the years 1987 to 2007

To date, incidental capture in bottom-set gillnets is recognized as a major threat to harbour porpoises in the ASCOBANS area (ASCOBANS 2003).

For an area in the German part of the Baltic Sea (along the Angeln and Schwansen coast including Flensborg Fjord and Eckernförde Bight[1]) a long time series of stranding and by-catch data from 1987 to 2008 is available. However, the proportion of by-catch reported by fishermen are particularly variable between periods. Some of the stranded carcasses had been sunk intentionally (Fig. 2) indicating a high estimated number of unreported cases, often giving reason for discussions between fishermen, environmentalists and authorities.

Fig. 2: Photo of dead porpoise found at beach south of Damp with inner organs removed and brick tied to fluke (20 June 2007)

[1] lat.: between 54°53,530'N and 54°27,294'N, long.: between 009°27,294'E and 010°29,247'E

The total amount of by-catches for the Baltic Sea, especially in German waters is still unclear. Earlier estimates of annual by-catches in the German Baltic Sea range from 14.5 individuals in the German part of the western Baltic Sea (Benke et al. 1991, for the period between 1990 and 1993) to 57 individuals in the western and 25 in the central Baltic Sea (Rubsch & Kock 2004).

From a re-examination of the data set within an ongoing monitoring scheme, we attempt to identify the proportion of by-caught animals and the significance of by-catch as cause of death for this part of the Baltic Sea, especially in the light of high numbers of carcasses washed ashore in 2007 and 2008.

Material and Methods

The shore of Angeln and Schwansen in Schleswig-Holstein as part of Kiel Bight represents the northernmost section of the German Baltic coast stretching over 130 km from the Danish-German border to the town of Eckernförde. It also includes the Schlei (a narrowing fjord where harbour porpoises rarely occur with sightings only in 1921,1930 and 2006).

All carcasses of harbour porpoises washed ashore between January 1, 1987 and December 31, 2008 were photographed and investigated *in situ*. Investigation at the beach included measurements, determination of sex and decomposition state (in five categories, tab. 1), as well as a careful examination for net marks or other indication of anthropogenic induced mortality such as incisions and body parts cut of. If an unintentionally by-caught animal was delivered by a fisherman, the location and circumstances of the capture were recorded in a questionnaire.

Tab. 1 decomposition stages of porpoises investigated in this study

category	**description**
I	freshly dead
II	beginning decomposition (skin peeling etc.)
III	moderate state of decomposition
IV	advanced decomposition, carcass intact
V	mummification or bones remaining on the shore

Since for the first three categories by-catch could be reliably determined using net marks and cuts as indication, by-catch numbers were extrapolated from unreported by-catches of decomposition states I to III to all strandings and the reported by-catch was added. The proportion of by-caught animals was calculated as follows:

$$\text{proportion of by - catch} = \frac{\left[\frac{\text{strandings cond.I - III with signs of bycatch}}{\text{all strandings cond. I - III}} * \text{all strandings} + \text{rep. bycatch}\right]}{\text{all strandings} + \text{rep. bycatch}} * 100$$

Results

Over all years, the proportion of by-caught animals was calculated to be 86.5 % of all stranded carcasses and reported by-catches.

The result of this study shows that the reported by-catch represents only a minimum estimate which is not suitable as a data basis for management purposes. A total of 247 harbour porpoise carcasses were investigated. Out of these, 152 were retrieved from the beach and 95 were delivered by fishermen. Another four by-caught individuals (not included in calculations) could be released alive (1989, 1990 and two individuals in 1992). Reported by-catches declined over the years whereas strandings increased from two in 1990 to 39 in 2008. From 1987 to 2000 the number of reported by-catch predominated the sample whereas from 2001 on most by-catches remained unreported (fig. 3).

167 porpoises were clearly identified as by-caught animals (95 reported by fishermen, 50 stranded carcasses of conditions I to III, 22 stranded carcasses of conditions IV and V). The latter were not included in calculations.

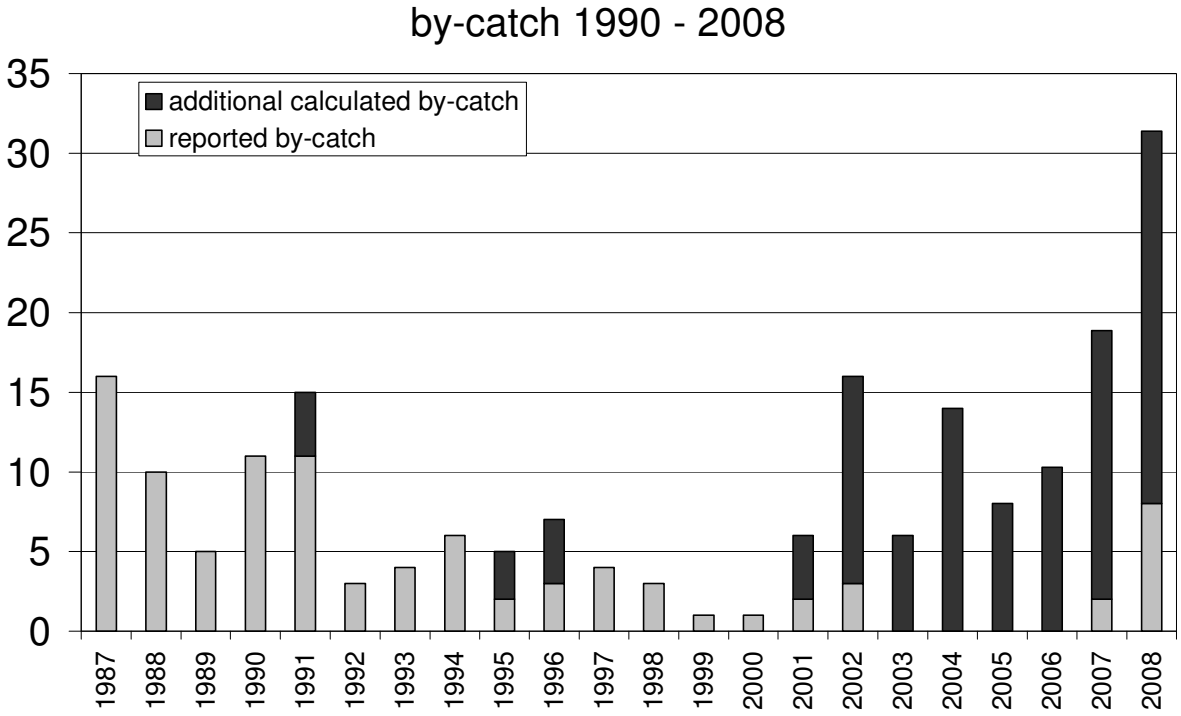

Fig. 3: Reported by-catch and additional calculated by-catch extrapolated from unreported by-catches of decomposition states I to III to all strandings

Discussion

The results indicate that by-catch is a major threat to harbour porpoises throughout the study area and most likely the whole south-western Baltic Sea. Applying our calculated overall 1987 to 2008 proportion of by-caught animals of 86.5 % to stranding and by-catch data along the German Baltic coast would result in 51 by-caught individuals in 2005, 82 in 2006 and 150 in 2007.
Relating these figures to the median abundance estimate from 10 surveys of the south-western Baltic Sea between 2003 and 2006 (1917 animals; cf. Scheidat et al. 2008) this would yield annual by-catch rates of 2.7 % of the population in 2005, 4.3 % in 2006 and 7.8 % in 2007. These annual by-catch rates can be considered a conservative estimate since the survey area of Scheidat et al. (2008) included Danish waters whereas the stranding and by-catch numbers are only from German coasts. Also sunk by-catches might easily be missed, therefore this figure may be an underestimate.

Further, a precautionary approach would require that the lower confidence limit is used for calculations. Doing so with the survey yielding the highest abundance estimate (4,610 individuals, CI: 2,259-9,098, Scheidat et al. 2008), the calculated annual by-catch rate in 2007 results in 6.6 % of the population size in this area (2005: 2.3 %, 2006: 3.6 %). All figures exceed the 1 % and 1.7% criteria proposed by the International Whaling Commission (2000) and ASCOBANS (2000).

Annual by-catch numbers for the German part of the Baltic Sea presented by Benke (1994) are much lower than those calculated applying the overall 1987 to 2008 proportion of by-catch for Angeln and Schwansen to the whole German Baltic coast. If the annual by-catch rate calculated in this paper is applied to stranding numbers from 2005 to 2007 it becomes evident that by-catch figures are closer to the estimation by Rubsch & Kock (2004) of 82 individuals.

The decrease in reported by-catch over the years can be attributed to changes in the numbers of fishermen, the number of vessels used during fishing operations, the quota, and most important fishermen's attitude to this issue. Despite the fact there is no legislation or punishment the majority of the fishermen seems to dislike the matter being discussed in the public and refuse to deliver any more by-caught harbour porpoises. This also seems to pertain for other than German fisheries. We realize that reported by-catch represents only a minimum estimate. Our results indicate a very high number of unreported cases. It is desirable to increase the number of reported by-catch in order to receive more fresh carcasses for a thorough scientific investigation and a more reliable analysis of the cause of death. For this purpose it is necessary to increase the awareness in fishermen.

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