

Collecting data on marine debris during cetacean aerial surveys

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Abstract

Marine debris has been shown to be detrimental to marine mammals, including cetaceans (e.g. Simmonds et al. *in press*). Information on the distribution and amount in the ocean is difficult to obtain. In this short working paper we examine the possibility to collect information on marine debris from dedicated aerial surveys for cetaceans.

Background

During dedicated cetacean aerial surveys it is common that not only the target species is recorded. Other records generally include all marine mammals at sea, e.g. seals and to some varying degree other megafauna. This could be birds, sea turtles, sharks and other large fish (e.g. Ridoux et al. 2010) or jellyfish. Further records that can be taken are different types of vessels (e.g. fishing vessels, ferries, military vessels), nets and marine debris. From these other records valuable information on distribution and relative densities of non-target species or objects can be derived (e.g. Herr et al. 2009).

During German aerial surveys for harbour porpoises (see Scheidat et al. 2008, Gilles et al. 2009), data on marine debris have been collected regularly since 2002. Following the German protocol, floating debris is recorded in two categories, “debris” and “debris associated with fisheries” (floating nets, lines, buoys etc.) When time allows, more information on the type is collected (such as size, colour, material). Figure 1 shows an example of the type of data that can be obtained (with all the caveats mentioned below). Figure 2 shows the results of a pilot study investigating debris data collected in German waters between 2002 and 2006, presenting debris densities.

The advantage of collecting information on marine debris during a survey is, that it can provide valuable information at the same temporal and spatial scale as used for the cetacean survey. Also this data is collected at no additional costs.

However, there are a few issues that need to be considered carefully:

- Collecting data on debris can take effort away from the target species, if the attention of the observers is diverted
- Effort for the collection of the data on marine debris will be lower priority when the target species are seen, thus the effort will not be the same throughout the survey (less debris when sightings of cetaceans are made); this needs to be taken into account in the analyses
- the definition of what is marine debris needs to be clear; e.g. is this anything manmade (e.g. including wooden crates) or only plastics; also up to what size is this collected (e.g. tetra packs vs. floating bath tubs).
- how much additional information needs to be collected, e.g. colouration, size, floating above or below surface
- sighting probability is dependent on weather condition (which is recorded during the survey, so correction for this is possible)
- the strip width in which debris is collected needs to be defined, as it is not possible to collect distance data on all items; in the same way it is difficult to collect each single item as there will be some areas with aggregations of marine debris, e.g. due to currents
- evaluating additionally collected data means a lot of extra work and specific funding for the evaluation of these data is needed

Conclusions:

- potentially useful, but this data collection must not interfere with survey effort and survey quality for the target species
- for investigating distribution, some type of more general counting method would be more useful than counting each single item (e.g. 1 minute effort bins with presence/absence of marine debris)
- a clear definition of what marine debris is, is needed
- it might be useful to choose one recognizable, “representative” type of marine debris which is not too frequent (e.g. balloons) to calculate densities for that subsample (and actually collect distance sampling data for that)
- funding for the investigation/evaluation of debris data should be thought of early on

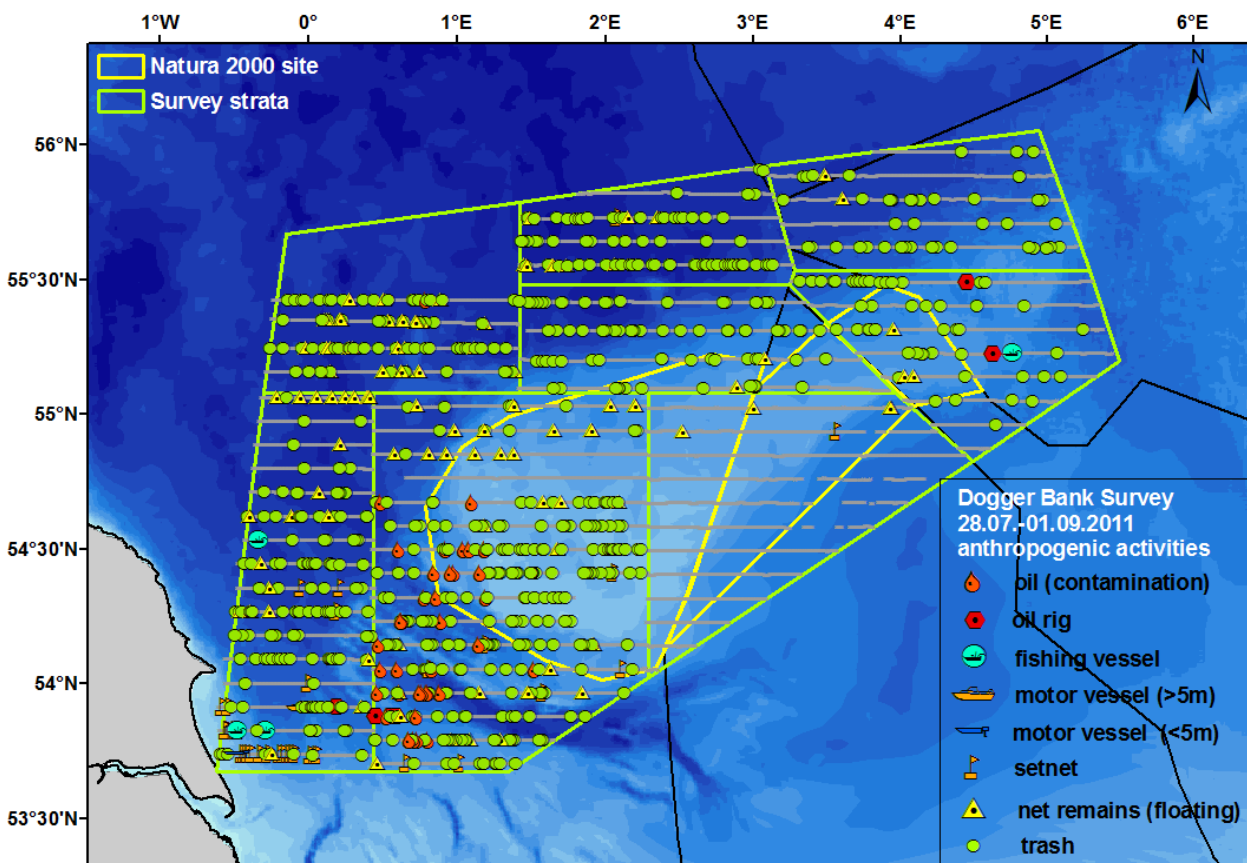


Figure 1: Recorded sightings of anthropogenic activities including sightings of debris and debris associated with fisheries during an aerial cetacean survey in the central North Sea in August 2011. Taken from Gilles et al. 2012 (note that in the south-eastern Dutch part only net debris was collected).

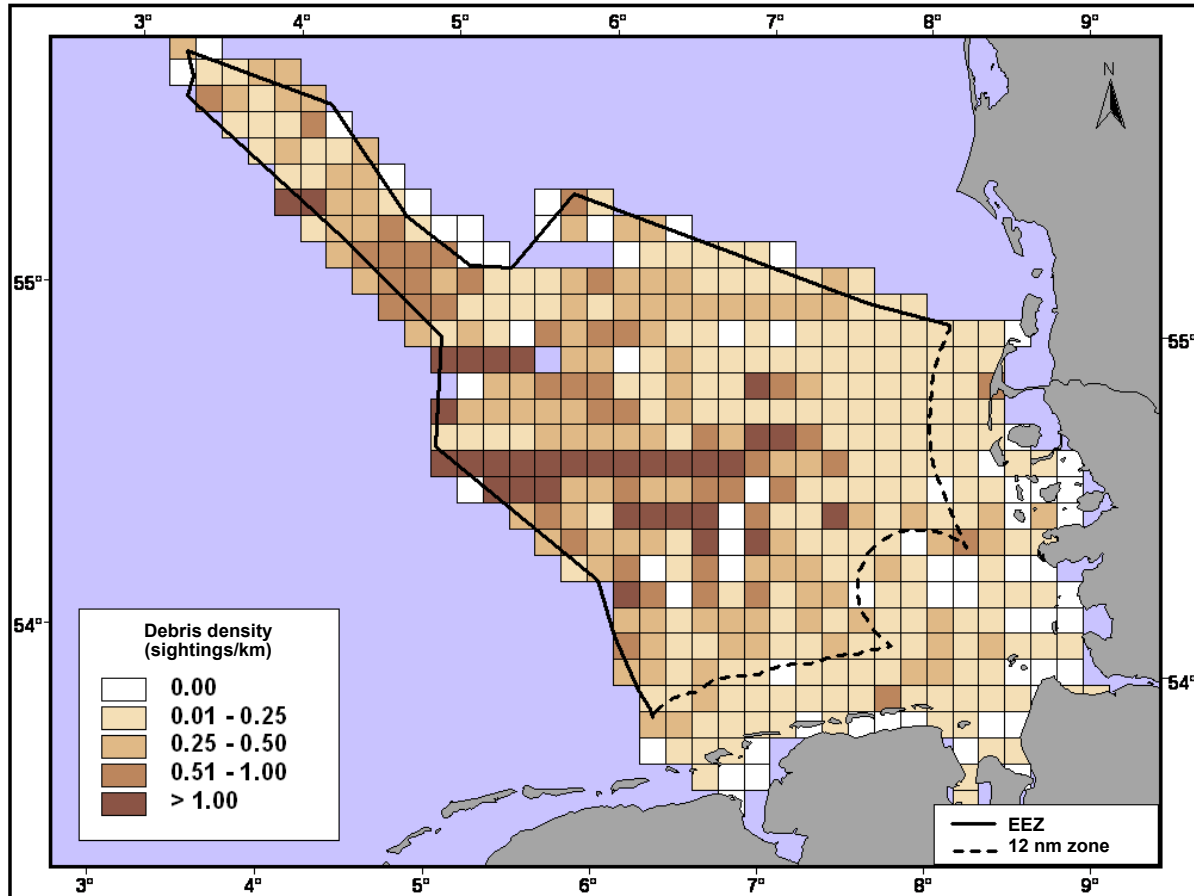


Fig. 2 Evaluation of debris sightings as items per km surveyed during aerial cetacean surveys in German waters between 2002 and 2006. Only sightings made in seastate 1 or lower were considered (AWZ – Exclusive Economic Zone). Adapted from Herr (2009).

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