

Large number of stranded harbour porpoises *Phocoena phocoena* as by-catch victims in Mauritania

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Introduction

In April 2012 a National Programme entitled “Biodiversité, Gaz, Pétrole” (BGP) was inaugurated in Nouakchott, Mauritania. The programme is spearheaded by the Ministry of Environment (MDEDD) in close cooperation with the ministry in charge of fisheries and the Ministry of oil, energy and mines. It is funded by the German Agency for International Cooperation (GIZ), the United Nations Development Programme (UNDP), IUCN and WWF.

An important part of the programme is the execution of an integrated marine and coastal biomonitoring scheme, inspired by the OSPAR programme (Davies and Vethaak 2012, INRAM 2013), which is currently in its first stage: the establishment of biological and chemical reference values of activities of biomarkers and levels of microcontaminants. This part of the program is implemented by the national “Institut Mauritanien des Recherches Océanographiques et des Pêches” (IMROP), “L'Office Nationale des Inspections Sanitaires des Produits de Pêche et de l'Aquaculture” (ONISPA) and “L'Institut Supérieur d'Enseignement Technologique” (ISET) in close cooperation with the Banc d'Arguin et the Diawling National Parks.

As a secondary activity within the monitoring programme, stranded cetaceans found while driving on the lower beach are being recorded four times per year. The states of the carcasses permitting, biometric data as well as stomach contents and blubber and/or liver samples are being collected for later analysis. Only if time and field conditions permit, whole or partial carcasses are safeguarded to obtain skeletal material. Remains are only inspected externally *in situ* to try to establish the cause of death. Thus far no complete autopsies have been done. Although only three surveys have been completed between November 2012 and May 2013, whereas historically the highest numbers of stranded cetaceans have been found in June (Maigret, 1976; Maigret *et al.*, 1980), high numbers of stranded carcasses of harbour porpoises *Phocoena phocoena*, besides other species, urged us to write this note.

Distributional, morphological and mt-DNA data strongly suggest that the Northwest African population of harbour porpoises, distributed from Agadir, Morocco, south to Joal-Fadiouth, Senegal, is distributionally disjunct and reproductively isolated from the Iberian and other European populations of the species (Van Waerebeek and Perrin, 2007). No abundance estimates are available but the population is believed to be small, hence vulnerable, reason why it was added to the Appendix II of the Convention on the Conservation of Migratory Species (CMS) in 2007 (Van Waerebeek and Perrin, 2007).

Material and methods

Beach surveys were carried out during receding tide with two 4x4 vehicles, from 2-18 November 2012, from 29 January till 13 February 2013 and from 23 April till 10 May 2013. The surveys cannot be considered as complete to record cetacean strandings as only minor parts (less than 5 km per survey) were searched on foot and the vehicles usually drove on the lower (hardest) parts of the beach which in many cases prevented views beyond the most recent high tide lines. The vehicle surveys covered the coast from Mamghar (Cap Timiris; 19°21'N, 016°31'W) in the North until the Senegalese border near N'Diogo (16°06'N, 016°30'W) in the South, a distance of 391 km (Fig. 1). The coast between Iwik (19°53'N, 016°17'W) and Mamghar (Parc National du Banc d'Arguin) was only partially covered during all surveys, almost completely only in February 2013. In the North, the beach between Cansado (20°51'N, 017°02'W) and Nouadhibou (20°53'N, 017°03'W) was surveyed in February 2013 only whereas Cap Blanc (20°46'N, 017°03'W), SW of Cansado, was visited during all three surveys. The Baie de l'Etoile (21°01'N, 017°00'W) and the Baie de l'Archimède (21°08'N, 016°56'W), NE of Nouadhibou, were only covered for a minor part.

Each cetacean encountered was photographed in detail and total length was measured if the animal was still intact. In some cases, such as with some of the whales, only skeletal remains were present such as skulls, and greatest cranial length and width were measured. The specimens were quickly inspected externally for major traumatic wounds and especially for evidence of cutmarks in case flukes, tailstock, dorsal or pectoral fins were severed, as these are indicative of by-catch and handling by fishermen. Details and photographs were then sent to the last author for (confirmation of) identification. For one harbour porpoise the stomach with contents and a blubber sample were collected. The blubber sample is pending further processing and analysis of micro-pollutants. Two harbour porpoises, found respectively in 2009 and 2012 and buried near the IMROP headquarters, were excavated to recover the skeletons. However, due to the dry and salty environment carcasses had hardly disintegrated and were rather mummified.

Results

On a total of 26 cetaceans encountered during three beach surveys of ca. 400 km each in Mauritania between November 2012 and May 2013, 10 (38%) were harbour porpoises (Table 1). Another two porpoises had been collected opportunistically between 2009 and 2012. The stomach that was collected contained remains of three *Sardinella aurita/maderensis* and one *Pteroscion peli*. The wear of the otoliths used for identification was too far advanced to distinguish between the two *Sardinella* species.

Table 1. List of 26 cetaceans encountered during three beach surveys of c. 400 km each in Mauritania, between November 2012 and May 2013, plus two individuals (*) collected opportunistically in 2009-2012. The baleen whale (cf.) specimens are potential records that require further study.

scientific name	total	cause of death known	of which by-catch
inspected			
<i>Phocoena phocoena</i>	12*	5	5
<i>Tursiops truncatus</i>	6	4	4
<i>Globicephala melas</i>	2	0	-
<i>G. macrorhynchus</i>	1	1	1
<i>Stenella frontalis</i>	1	0	-
cf. <i>Megaptera novaeangliae</i>	1	0	-
cf. <i>Balaenoptera borealis</i>	1	0	-
<i>Balaenoptera</i> sp.	2	0	-
Unidentified large whale	1	0	-
SUB-TOTAL	27	10	10
not inspected			
unknown species	1	0	-
TOTAL	28	0	-

Discussion

Of ten individuals for which the cause of death could be established (on a total of 27 inspected) all had severe cutmarks and all but one were lacking tailstocks, flukes or dorsal fins. Such signs were indicative for by-catch victims which had been deliberately mutilated to facilitate removal of carcasses from fishing nets. Therefore we consider by-catch as the principal, if not only, cause of death in these individuals.

Only very few instances of cetacean by-catch in Mauritanian waters have been documented and published in any detail (e.g. Maigret, 1994; Nieri *et al.*, 1999; Zeeberg *et al.*, 2006). However this lack of data should certainly not be construed as to reflect on some rareness of by-catches. Fishermen in the subregion do not report any cetaceans caught. In fact the principal threat to the West African population of *P. phocoena* is thought to be accidental net entanglements, in view of the intensive coastal fishing effort in its four range states, i.e. Morocco, Western Sahara, Mauritania and Senegal. The International Whaling Commission (1996) noted the problem for the species as a whole, and in areas where adequate data on abundance and by-catch levels exist, incidental mortality exceeds sustainable levels.

Harbour porpoises have been captured in Senegal by artisanal fishermen with some regularity for many decades albeit in small numbers (reviewed in Van Waerebeek *et al.* 2000; Van Waerebeek and Perrin, 2007). In the 1990s, harbour porpoises were taken by the artisanal lobster fishery in the northern border areas of Mauritania. Several of the circa 15 collection specimens available from Mauritania (7 skulls at IMROP, 5 at PNBA, 3 at IFAN) are thought to originate from fisheries' victims. Maigret (1994) estimated by-catch 'at less than 20 per year', adding that the population is thought to be small along the northwestern African coasts. A total of 51 stranded specimens were reported for Mauritania (Robineau and Vely, 1998) but the fraction due to by-catches was not estimated.

Surveying of beaches by vehicle does not detect the totality of cetacean remains, in particular of small species such as porpoises, and thus underestimates mortality. Scattered bones, including skulls, often become (partially) covered by blowing sand and may easily be overlooked. This was illustrated by even large whale remains that had been present in November 2012 but were only discovered in May 2013, after two previous passages. Surveying on foot is much more effective to find scattered remains, but is far slower. On two occasions when a few km of beach were searched on foot, remains of two harbour porpoises were discovered. These would otherwise not have been found from the moving vehicle. Therefore we consider the numbers of cetaceans found and reported here a minimum of the true numbers present.

The type of fishery that caused the harbour porpoise by-catch reported here is unknown as are other potential causes of death. In this respect it should be noted that frequent seismic surveys are being conducted on the Mauritanian continental shelf where oil is being exploited since 2006. There is evidence that cetaceans can be directly harmed by powerful noises (Simmonds *et al.*, 2004; Gray and Van Waerebeek, 2011). Other potentially (lethal) hazards that may cause high mortality rates include (viral) diseases, in particular Morbilliviridae epizootics (reviewed in Van Bresseem *et al.*, 1999). The population of monk seals *Monachus monachus* at Cap Blanc was decimated in 1997. A morbillivirus was put forward as the most likely factor (Osterhaus *et al.*, 1997). Cap Blanc is also a known high-density distributional area for harbour porpoises (Boisseau *et al.*, 2007).

It is considered of critical importance that the cetacean strandings in Mauritania be studied in detail in the near future to assess its potential impact on population levels, in particular of the harbour porpoise. Such a study should preferably also take into account the size, natural history and viability of the harbour porpoise population in its four range states and include extensive searches on foot. In May-June of the years 2003 – 2005 several special missions were organized by IUCN in Mauritania to

assess cetacean strandings and in each of these missions 100 to over 200 cetaceans were found (e.g. Bouju, 2003). However, the proportion of harbour porpoises in these strandings remains unknown as not all carcasses could be properly identified. The BGP Programme is actually looking for additional funding to cover at least parts of such a study.

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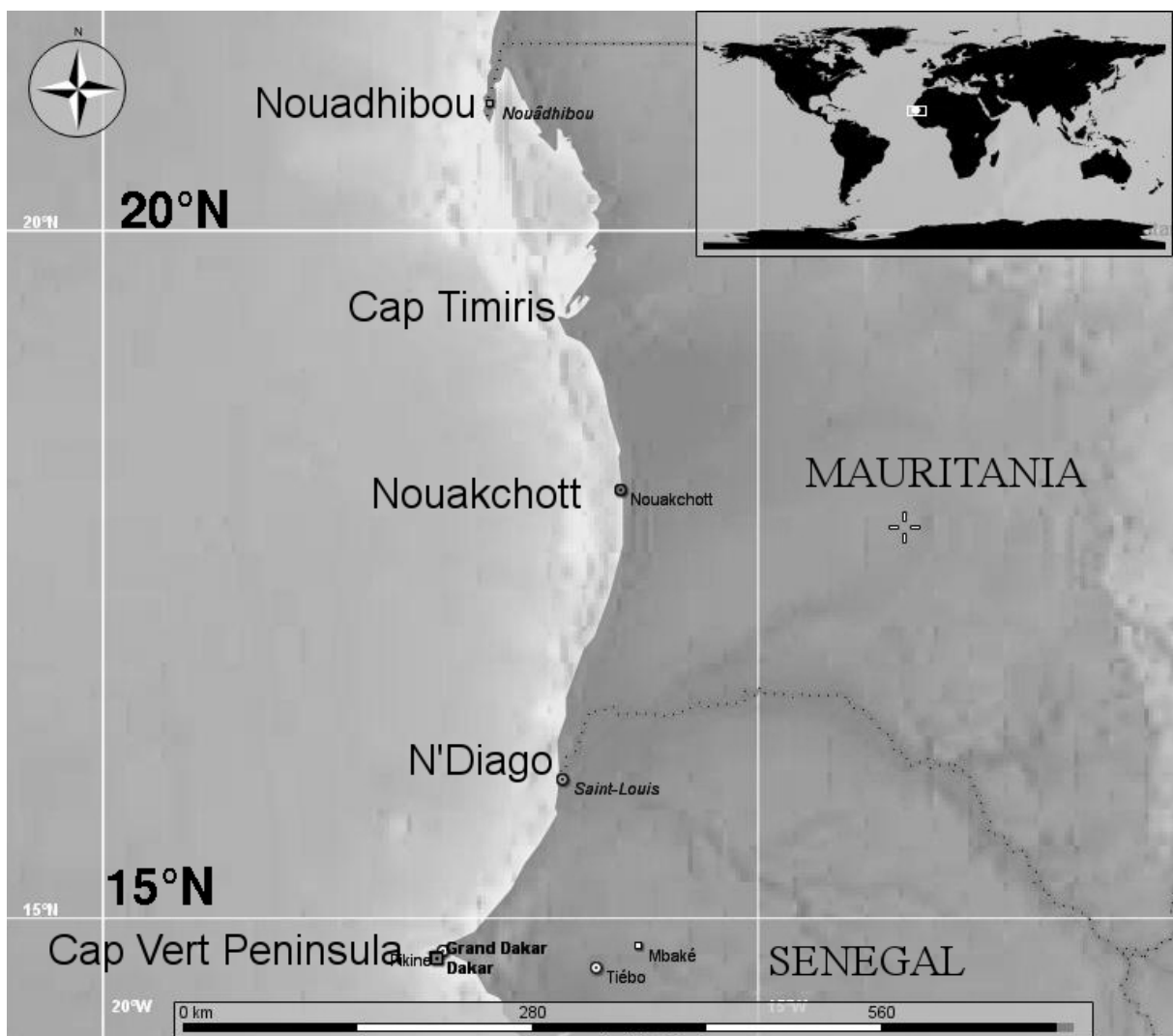


Figure 1. Map of the coastal study area between N'Diago and Nouadhibou, Mauritania.