

## Cetacean landings at the fisheries port of Dixcove, Ghana in 2013-14: a preliminary appraisal

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### ABSTRACT

Over 263 days of monitoring of fish landing procedures at Dixcove port, western Ghana, between January 2013 and February 2014, a local fisheries officer reported 743 small cetaceans landed. Of these, 109 specimens were identifiable to species (N=9) from photographs, comprising: 32.1% *Stenella clymene*, 17.4% *Stenella attenuata*, 14.7% *Peponocephala electra*, 12.8% *Steno bredanensis*, 6.4% *Tursiops truncatus*, 5.5% *Globicephala macrorhynchus*, 5.5% *Stenella longirostris*, 3.7% *Delphinus cf. capensis* and 1.8% *Feresa attenuata*. Most individuals appeared subadult or juvenile, including several calves. Only minor changes in species composition were recognised compared to 1999-2010. However, assuming field observer data to be broadly reliable, daily cetacean landings may have increased from 0.74 animals day<sup>-1</sup> in 2001-2003 (Debrah *et al.* 2010) to 2.82 animals day<sup>-1</sup> in 2013-14. Without a national management plan or abundance estimates, such a level of exploitation in a single port is of concern, particularly for *S. clymene* accounting for 1/3 of takes. Cetacean carcasses are processed locally and sold for human consumption (marine bushmeat).

### INTRODUCTION

The exploitation of small cetaceans in Ghana, consisting of mainly tropical water delphinids, is one of the most extensive in Africa. Features of the combined by-catch and intentional takes have been reported on since 1997 (Ofori-Danson and Odei, 1997; Van Waerebeek and Ofori-Danson, 1999; Ofori-Danson *et al.*, 2003; Debrah, 2000; Van Waerebeek *et al.*, 2009; Debrah *et al.*, 2010). However available data are limited as interest has basically been academical and out of conservation concern by a few NGOs, led by COREWAM. No statistics on cetacean takes are collected at the national level as cetaceans still appear to be considered by-catch instead of target species among some managers of Ghana's artisanal fisheries. Considering minimal resources, limited and periodical monitoring is coordinated by biologists from the University of Ghana at Legon and the University of Cape Coast, all in Ghana, in collaboration with the Peruvian Centre for Cetacean Research (CEPEC) for its expertise on small cetacean exploitation in small-scale fisheries.

Total annual cetacean landings have not been estimated due to a shortage of reliable field observers and a lack of verifiable data from most fishing ports in Ghana. An evaluation of species composition was carried out based on archived photographic evidence of a random sample of specimens (N = 212) in 1994-2010 (Debrah *et al.* 2010). These authors showed that three delphinids accounted for half the sample of documented and identifiable landings at Dixcove, Axim and Apam, namely : 24.5% Clymene dolphin *Stenella clymene*, 13.2% pantropical spotted dolphin *Stenella attenuata* and 12.3% common bottlenose dolphin *Tursiops truncatus*. Another three species were also regularly landed: 10.4% melon-headed whale *Peponocephala electra*, 9.4% short-finned pilot whale *Globicephala macrorhynchus* and 9.4% long-beaked common dolphin *Delphinus cf. capensis*. Occasionally landed species comprised: 6.1% rough-toothed dolphin *Steno bredanensis*, 4.7% Risso's dolphin *Grampus griseus*, 2.9% kogiids (confirmed only *Kogia sima*) and 2.8% spinner dolphin *Stenella longirostris*. Rarely landed species (<2%) included Atlantic spotted dolphin *Stenella frontalis*, Fraser's dolphin *Lagenodelphis hosei*, false killer whale *Pseudorca crassidens*, pygmy killer whale *Feresa attenuata*, and Cuvier's beaked whale *Ziphius cavirostris*. One small sperm whale was recorded taken offshore.

Here we document catch rates and the species composition of landings in 2013-14 and make a preliminary comparison with those that occurred in 1995-2010.

### MATERIAL AND METHODS

The number of small cetaceans landed at Dixcove port (04°48'N, 01°57'W) in Ghana's Western Region were tallied over a total of 263 days between 9 January 2013 and 22 February 2014 by a local fisheries officer during his regular duties of supervising and recording fisheries activities and landings at the port. The field observer was not requested to identify species considering that in the past Debrah *et al.* (2010) had found that, despite training, this had proved to yield unreliable results due to a lack of expertise. Instead the field observer, equipped with a camera, was invited to take photographs of

whole carcasses as well as of any freshly butchered remains. The authors identified the cetaceans from these photographs, archived at COREWAM and CEPEC, thus providing direct evidence of the species composition and an absolute minimum number of captured small cetaceans. Below we offer a preliminary evaluation of raw port monitoring data.

## RESULTS AND DISCUSSION

Landings of freshly dead small cetaceans as reported at Dixcove for the January 2013 - February 2014 study period are listed in Table 1. During 263 days of monitoring fish landings by artisanal fishermen at this port, a local fisheries officer reported 743 small cetaceans landed, or a mean landings rate of 2.82 animals day<sup>-1</sup>. Of these, 109 specimens were photographed providing verifiable evidence for the cetacean exploitation and its species composition (Table 2). Photographs of the freshly butchered remains of another 4 specimens did not allow identification, but bringing to 113 the total number of both landed and documented cetaceans. Animals were landed year-round with little variation between months (Table 1). It is unclear whether additional specimens were cut up offshore for bait, a common practice in other artisanal fisheries.

**Table 1.** Monthly landings of small cetaceans at Dixcove port, Ghana, as reported by a local fisheries officer, between January 2013 and February 2014. Mean daily catch rate showed little monthly variation. Number of landed specimens photographed (including 4 butchered) was determined by the authors from verifiable graphic evidence.

Month, Year	N° cetaceans reported	N° days monitored	mean daily catch rate	N° cetaceans photographed
January, 2013	30	8	3.75	30
February	32	13	2.46	5
March	105	31	3.39	3
April	110	30	3.67	7
May	99	31	3.19	2
June	78	30	2.60	5
July	69	31	2.23	10
August	71	31	2.29	5
September	75	30	2.50	3
October	21	11	1.91	3
November	25	8	3.12	14
December	10	4	2.50	8
January, 2014	16	4	4.0	16
February	2	1	---	2
TOTAL	743	263	2.82	113

Assuming that the daily tally data by the fisheries observer were grossly reliable, landings would have multiplied, from a daily landings rate of 0.74 animals day<sup>-1</sup> in 2001-2003 (Debrah *et al.* 2010) to 2.82 animals day<sup>-1</sup> for 2013-14. Considering that no national management programme is operational and no abundance estimates exist, an increasing trend in catches should be of great concern. The West African (eastern tropical Atlantic) population of Clymene dolphin in particular may be under pressure. Van Waerebeek and Perrin (2007) had earlier expressed concern and formally proposed this population to be listed on CMS Appendix II, which was approved by the CMS Parties.

**Table 2.** Species composition of cetaceans landed at Dixcove, Ghana, as determined from photographs. Data for 2013-2014, with minor shifts, were grossly comparable to those for 1999-2013 (Debrah *et al.*, 2010). An additional 4 specimens for 2013-14, already butchered, were excluded as species was not identified.

Species	N° in 2013-14	% 2013-14	% 1999-2010 (n=
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	(n= 109)		156)
<i>Stenella clymene</i>	35	32.1	30.1
<i>Stenella attenuata</i>	19	17.4	10.9
<i>Peponocephala electra</i>	16	14.7	13.5
<i>Steno bredanensis</i>	14	12.8	3.2
<i>Tursiops truncatus</i>	7	6.4	9.0
<i>Globicephala macrorhynchus</i>	6	5.5	10.3
<i>Stenella longirostris</i>	6	5.5	2.6
<i>Delphinus cf. capensis</i>	4	3.7	12.2
<i>Feresa attenuata</i>	2	1.8	0.6
<i>Grampus griseus</i>	0	0	3.8
<i>Kogia</i> sp.	0	0	1.9
<i>Lagenodelphis hosei</i>	0	0	0.6
<i>Stenella frontalis</i>	0	0	0.6
<i>Pseudorca crassidens</i>	0	0	0.6
<b>TOTAL</b>	<b>109</b>	<b>100</b>	<b>100</b>

Nine different species were documented taken in 2013-14 comprising seven tropical and two cosmopolitan Delphinidae, all previously recorded in Ghanaian waters (Van Waerebeek *et al.*, 2009). Despite some minor shifts, such as a higher rate of rough-toothed dolphins captured in 2013-14, species composition was grossly comparable (Table 2) to the one reported by Debrah *et al.* (2010). Half of the catch was taken up by Clymene dolphins and pantropical spotted dolphins, the former species accounting for almost a third (32.1%) of takes. Only melon-headed whales (14.7%) and rough-toothed dolphins (12.8%) also represented more than 10% of the landed catch (Table 2). Common bottlenose dolphins, short-finned pilot whales, spinner dolphins and long-beaked common dolphins accounted each for 4-7% of cetacean landings. Pygmy killer whales were rare, with only two confirmed cases (Table 2). Fraser's dolphin, Risso's dolphin, Atlantic spotted dolphin, false killer whale and kogiids were absent from the 2013-2014 record at Dixcove (Table 2), species of which a few individuals had been recorded in 1999-2010 (Debrah *et al.* 2010). As deduced from morphologic cues including relative length, many of the dolphins appeared to be subadult or juvenile, and several calves were landed.

While most animals were thought to have been entangled in (large-mesh) drift gillnets, the primary fishing method practiced by artisanal fishermen operating from Dixcove (Debrah *et al.* 2010), several dolphins showed lethal penetrating injuries (some with protruding intestines) as inflicted by either hand-held harpoons or spears, demonstrating the continuation of at least occasional directed captures (Van Waerebeek and Ofori-Danson, 1999; Ofori-Danson *et al.*, 2003; Debrah, 2000). The gillnet fishery targets many pelagic species, but mainly billfishes, Tunnidae and several shark species (Debrah, 2000). No changes in the handling and commercial practices, in comparison with former years, were reported by the field observer. Dolphin carcasses were processed *in situ*, i.e. cut up in small pieces on the landing beaches. Virtually all body parts of the dolphins were used for marine bushmeat (including heads and internal organs), and were typically smoked, similarly as is done with the various species of billfish. The end product was traded for human consumption, much of it out-of-town, as before (Debrah *et al.* 2010).

Several serious deficiencies exist with the current monitoring system, including focal instead of national coverage, discontinuity and widely fluctuating intensity of monitoring effort over time. For instance, only 15.2% of dolphins reported landed at Dixcove in 2013-14 were photographed, where ideally this should be over 90%, both to improve the sample size for species composition estimation and to address potential concerns about reliability of landings data. Moreover, no regular biological sampling is implemented, partly the result of the high monetary value of organs and any parts of the dolphin carcass. A coordinated national programme is urgently needed to systematically survey and sample cetacean captures and strandings along the entire Ghana coast.

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