

SC/MAY19/AAWW/04

On the utilisation of by-caught, hunted and stranded cetaceans in West Africa

Segniagbeto, G.H., Ayissi, I., Bamy, I.L., Debrah, J., Djiba, A., Dossou-Bodjrenou, J., Ofori-Danson, P.K., Bilal, A.S.O., Sohoun, Z., Tchibozo, S., Uwagbae, M. and Van Waerebeek, K.



INTERNATIONAL
WHALING COMMISSION

On the utilisation of by-caught, hunted and stranded cetaceans in West Africa ¹

Gabriel Hoinsoudé Segniagbeto¹, Isidore Ayissi^{2,14}, Idrissa L. Bamy³, Joseph Debrah^{4,5}, Abdoulaye Djiba⁶, Josea Dossou-Bodjrenou⁷, Patrick Kwabena Ofori-Danson⁸, Abdellahi Samba Ould Bilal⁹, Zacharie Sohou¹⁰, Sévérin Tchibozo¹¹, Michael Uwagbae¹² and Koen Van Waerebeek^{5,6,13}

¹ Laboratoire d'Écologie et d'Écotoxicologie Faculté des Sciences, Université de Lomé, Togo

² Association Camerounaise de Biologie Marine, BP 52, Ayos, Cameroon

³ Bureau du Directeur, Centre National des Sciences Halieutiques de Boussoura (CNSHB), Ministère de la Pêche et de l'Aquaculture, Conakry, Guinea

⁴ Department of Fisheries and Aquatic Sciences, University of Cape Coast, Cape Coast, Ghana

⁵ Conservation and Research of West African Aquatic Mammals (COREWAM), c/o Dept. Marine and Fisheries Sciences, University of Ghana, P.O. Box LG 99, Legon, Ghana

⁶ COREWAM-Senegal, Keur Mbaye Fall extension N° 196/B, Dakar, Senegal

⁷ Musée des Sciences Naturelles, Nature Tropicale ong, Akpakpa, Cotonou, Bénin

⁸ Department of Marine and Fisheries Sciences, University of Ghana, P.O. Box LG 99, Legon, Ghana

⁹ Institut Mauritanien de Recherches Océanographiques et des Pêches (IMROP), Nouadhibou, Mauritanie

¹⁰ Benin Fisheries and Oceanologic Research Institute (IRHOB), Cotonou, Bénin

¹¹ Centre de Recherche pour la Gestion de la Biodiversité (CRGB), Cotonou, Bénin

¹² Initiative for Life, Empowerment and Development (i-LEAD), Benin City, Nigeria

¹³ Peruvian Centre for Cetacean Research/ Centro Peruano de Estudios Cetológicos (CEPEC), Lima 20, Peru

¹⁴ Institute of Fisheries and Aquatic Sciences, University of Douala, PO Box 7236 Bassa-Douala-Cameroun

ABSTRACT

Documented records of cetacean utilisation in West Africa (WAF) are scarce due to several limiting factors: (i) because illegal or considered illegal in most nations; (ii) no official catch statistics of cetaceans are maintained in any WAF nation; (iii) scarcity of long-term dedicated survey effort by academics or NGOs; (iv) landings at ports are often conducted covertly for fear of confiscation and fines; (v) local technical expertise (e.g. for species identification) is very limited; (vi) no dedicated market studies exist and the economic importance of cetacean products is unknown.

We did not find any specific published evidence of cetacean utilisation for 6 WAF nations (Morocco, Western Sahara, Guinea-Bissau, Sierra Leone, Liberia, São Tomé and Príncipe, and Equatorial Guinea), while for Côte d'Ivoire only (historical) harpooning for scientific purposes were reported. This, we suggest, can be attributed to either a genuine lack of human consumption and bait use (e.g. in Western Sahara, Morocco), or in others (presumably in Sierra Leone, Liberia, Côte d'Ivoire) explainable by non-reporting and lack of survey effort. For 7 nations (Mauritania, Cape Verde Islands, The Gambia, Guinea-Bissau, Guinea, Togo and Benin) there are clear indications for the occasional up to regular (but not systematic), use of cetacean carcasses. In four nations (Ghana, Nigeria, Cameroon, Senegal) utilisation of cetacean carcasses either from fisheries or strandings, ranges from being wide-spread to virtually 100% use. Directed takes are common in at least Ghana and Nigeria. Although cetaceans are protected in most nations, both through international conventions and by national legislation, the latter is often overly concise and sometimes unclear, and could benefit from updating. Specifically the (il)legality of utilisation of dead cetaceans is rarely addressed and remains ambiguous. A nation-wide public debate may be desirable, as diverse and complex aspects need to be considered.

The large majority of landed cetaceans are destined for human consumption (marine bushmeat), either locally or in the hinterland. Their use as fishing bait (mainly shark bait), we could confirm only for Ghana, Nigeria and Senegal. In case of whale strandings, often a public health argument opposes utilisation, however cases of whale flensing in at least 6 nations (Senegal, Guinea, Ghana, Togo, Benin, and Cameroon) show that coastal communities may relativise potential risks and consider direct access to large quantities of free protein as more important.

Regionally at least 23 species are documented to be utilised following capture or stranding (19 odontocetes, 4 baleen whales). The exploitation in Ghana involves 78% of these. Species include: *Phocoena phocoena*, *Stenella attenuata*, *Stenella clymene*, *Stenella longirostris*, *Stenella frontalis*, *Stenella coeruleoalba*, *Globicephala macrorhynchus*, *Peponocephala electra*, *Lagenodelphis hosei*, *Feresa attenuata*, *Pseudorca crassidens*, *Tursiops truncatus*, *Sousa teuszii*, *Delphinus* spp., *Steno bredanensis*, *Grampus griseus*, *Kogia breviceps*, *Ziphius cavirostris*, *Physeter macrocephalus*. Among baleen whales feature *Megaptera novaeangliae*, *Balaenoptera acutorostrata*, *B. bonaerensis*, *B. brydei*.

Overexploitation and the decline of fish stocks in WAF may be or become a driver for cetacean exploitation. Arguably, the species with immediate threats to their long-term persistence are *S. teuszii* and the *P. phocoena* population in Mauritania. A potential mechanism is suggested to link improved data collection to a better management of landed cetaceans.

Keywords: Utilisation, Dolphin captures, Fisheries interactions, Marine bushmeat, West Africa, Gulf of Guinea.

INTRODUCTION

The overall decline in West African fish stocks, the smaller mean size of landed fishes, due to overexploitation (Brashares et al., 2004) compounded by poverty and fast expanding coastal-dwelling human populations with surging demands for protein, are motives for West African fishermen to actively exploit formerly largely ignored marine resources such as cetaceans and sea turtles (Segniagbeto et al., 2014).

¹ Authors ordered alphabetically after the first author.

Exploited cetacean populations, whether removals are by-catch (incidental catch) or from hunting, necessarily call for a sustainable management plan as to avoid depletion in the long-term. This requires minimum data on the numbers and species captured and types of fisheries involved. Except perhaps for Ghana for which a fair amount of data is available (e.g. Van Waerebeek and Ofori-Danson, 1999; Debrah, 2000; Ofori-Danson *et al.*, 2003; Debrah *et al.*, 2010; Van Waerebeek *et al.*, 2014), published information on the utilisation of by-caught, hunted or stranded cetaceans in western Africa is exceedingly scant. Here we critically review and summarize per nation available information with focus on documented cases where dead dolphins and whales were consumed or used as fish bait, medicinal or religious purposes, in 18 Western African coastal states: from Morocco in the northwest to Equatorial Guinea in the southeast.

The cetacean diversity of this subregion has been described or reviewed by a number of studies (e.g. Jefferson *et al.*, 1997; Murphy *et al.*, 1997; Van Waerebeek *et al.*, 2000, 2009; Perrin and Van Waerebeek, 2012; Segniagbeto *et al.*, 2014; Masski and de Stephanis, 2015; Djiba *et al.*, 2015; de Boer *et al.*, 2016; Leeney *et al.*, 2016; Weir *et al.* 2008, 2011) but is as yet still incompletely known. New range state records are still regularly reported (e.g. Jung *et al.*, 2015; Van Waerebeek *et al.*, 2017).

While cetaceans to varying degrees are legally protected species in most WAF nations, we found no few provisions that specifically regulate the utilisation of cetaceans encountered dead, either stranded freshly dead, moribund or by-caught and salvaged. This lack of clarity applies also to a regionally concluded but non-binding MoU Concerning the Conservation of the Manatee and Small Cetaceans of Western and Macaronesia, concluded in Lomé, Togo, in October 2008. It leaves the door open for multiple interpretations of what is allowed or not, and a frequent pragmatic conclusion is that utilisation of dead cetaceans is not illegal.

Apart from issues of management, conservation and animal welfare, public health is another relevant aspect to human consumption of cetacean carcasses to be considered. Potential zoonotic disease transmission (e.g. brucellosis) and high contaminant loads from chemical pollution may be problematic. Little has been published on organochlorines and trace elements in WAF coastal waters, but for instance, Gnanidi and Tobschall (1999) warn about pollution of marine sediments by trace elements in the coastal region of Togo caused by dumping of cadmium-rich phosphorite tailing into the sea. In addition, many terminals of containers have been built or are under construction in recent years in the region with an increase in maritime traffic and hydrocarbon pollution and its potential impacts on the marine environment including marine mammals. It should therefore be noted that the many oil development projects in the region (Sabato Ceraldi *et al.* 2016) would have an impact on the marine and coastal environment. However, in this work, we focus only on the utilisation of by-caught, hunted and stranded cetaceans in West Africa.

MATERIAL AND METHODS

Here we provide a preliminary (incomplete) review of well-documented cases of utilisation of cetaceans in coastal nations in West Africa (WAF), both taken from the literature and new accounts. The aim was to produce a synoptic summary of the historical and current status in each country. We consulted and critically evaluated primary sources, including informal reports, and considered new insights from earlier reviews (e.g. Consentino and Fisher, 2016; Weir and Pierce, 2012; Segniagbeto *et al.* 2014; Robards and Reeves, 2011). The majority of reported cases consist of observations made during various types of coastal field work, some dedicated, others opportunistic. Examples of longer-term dedicated work included the CMS/WAF CET projects in 1999-2002 (Van Waerebeek *et al.*, 2000, 2003), beach-combing surveys by IMROP in Mauritania (2013-2018), coastal surveys by CNSHB around the Tristao Islands, northern Guinea, in 2017, and port monitoring in Ghana. Specific cases of utilisation were accepted if they were supported by photo(s), specimens and/or a case description by first-hand sources considered reliable.

The interview approach of fishers often results in interesting insights, especially on fishing techniques and serves a useful role in port surveys, also while it provides general guidance and promotes contact-establishing (Leeney *et al.*, 2015; Ayissi *et al.*, 2011; Moore *et al.*, 2010). However, unless supported by *in situ* accounts from trained observers or photographic evidence, interviews rarely supply reliable information on the species and numbers of cetaceans captured. Results, while still worth reporting, remain often vague, e.g. a bycatch incidence rate defined as the proportion of interview respondents reporting at least one capture per year (Moore *et al.*, 2010).

The IWC SC broadly defines 'aquatic wild meat' as including cetacean products for any usage (consumption, fishing bait, traditional medicine, ceremonies, etc.). However when cetacean parts are destined for human consumption we retain the classic terminology of bushmeat (*viande de brousse*) and its subcategory marine or aquatic bushmeat (Alfaro and Van Waerebeek, 2004; Clapham and Van Waerebeek, 2007; Consentino and Fisher, 2016; Weir and Pierce, 2012). This carries the advantage of an immediate, universal understanding and emphasizes the similar trade dynamics, product presentation and distribution mechanisms on the African continent, and the universal use of the bushmeat concept in technical literature (e.g., Rose, 1998; Brashares *et al.*, 2004; Rowcliffe *et al.*, 2005; Clapham and Van Waerebeek, 2007; Wilcox and Nambu 2007; Ikpa *et al.*, 2009; Ayissi and Fourier, 2018), legal documents and popular press.

Geographically, we here apply a modified interpretation of the UN definition of West Africa, and consider all African nations (n= 18) bordering the eastern Atlantic Ocean, from the Strait of Gibraltar, Morocco, to southern Equatorial Guinea, thus including the entire Gulf of Guinea. The latter is defined by the International Hydrographic Organisation

(1953) as the waters NE of a line running in SE direction from Cape Palmas in eastern Liberia to Cape Lopez (00°38'S, 08°42'E) in Gabon.

RESULTS AND DISCUSSION

Morocco

No cetacean bycatch statistics have been published and we are unaware of any information on the utilisation of cetaceans in Morocco. Historically on a few occasions small cetaceans have been harpooned in Morocco for study purposes. For instance at least 22 *Delphinus delphis* were taken by Aloncle (1964) for a skeletal variation study. One historical record refers to a *T. truncatus* captured near the Moroccan coast in the Strait of Gibraltar, 4 June 1966 (Dollfus, 1968). Masski and de Stephanis (2015) in a study of strandings noted that carcasses of delphinids with 'fins missing' or 'harmed' were found mainly around or north of Agadir, without specifying the species involved. Masski and de Stephanis (2015) did not discuss potential utilisation of certain specimens. Amputated fins by itself is no indication of utilisation, as fishermen typically cut fins to facilitate the removal of carcasses from nets, and may discard the carcasses. Other cut marks and 'injuries' require careful evaluation. It is unclear whether some of the cetacean bycatches in the large-scale pelagic fishery such as in the Alboran Sea by the Moroccan drifnet fleet (Tudela *et al.*, 2005) may be utilised (bait?) or not. Probably most dolphins are discarded.

Western Sahara

Hardly any information is available for Western Sahara. A coastal set net fishery for lobsters sometimes caught porpoises and dolphins (Maigret, 1994) but it is unknown whether the carcasses were utilised. Notarbartolo di Sciarra *et al.* (1998) mentioned potential by-catches of *S. teuszii* and *T. truncatus* in Dakhla Bay, but not the utilisation of dolphins. The situation today is largely unknown and a comprehensive recent study of strandings in Morocco, including (occupied) Western Sahara (Masski and de Stephanis, 2015) provide little insights. It seems unlikely though that any directed takes occur, but some level of by-catch is to be expected.

Mauritania

There are reasonable amounts of data on by-catches of cetaceans in Mauritanian waters (e.g. Maigret, 1994; Nieri *et al.*, 1999; Zeeberg *et al.*, 2006; Mullié *et al.*, 2013) but documented cases of utilised specimens are scarce.

Harbour porpoises and dolphins were taken by the artisanal lobster fishery in the border area between Western Sahara and Mauritania (estimated at less than 20 per year) (Maigret, 1994), with no knowledge of utilisation. Duguay (1976) reported that around 1968 the harpooning of 'porpoises' (*marsouins*), surely referring also if not mainly to small delphinids, occurred relatively frequently from fishing vessels operating in Mauritanian waters.

Nieri *et al.* (1999) mentioned that consumption of dolphin meat in Mauritania, by locals, does not appear to be exceptional. During CMS/WAF CET projects in Senegal (1999-2002), several fishermen indicated that especially Senegalese nationals residing in Mauritania consumed dolphin meat and this is confirmed to be still the case today (A.S.O.B., personal observations).

Busnel (1973) described [paper not seen] a dolphin being cut up for food by Imragen fishermen. Robineau (1995) also reported, without details, the intentional capture of a bottlenose dolphin by Imragen. He noted that among Imragen no taboo exists against human consumption of dolphin meat, although they often interact collaboratively with bottlenose dolphins in the inshore fishery of mullet.

A number of stranded harbour porpoise remains examined before 2013 (Mullié *et al.*, 2013) showed evidence of having been cut-up for indeterminate use. During IMROP beach-combing effort in 2013-2018, among beach-cast remains of 676 cetaceans, 34 (5%) showed clear evidence of post-mortem human manipulation and utilisation, mainly knife cut marks (A.S.O.B., personal observations) which are not limited to severed dorsal, pectoral or caudal fins. Two specific cases (supported by photos) involved a complete harbour porpoise carcass found in a knotted bag, ready to be taken away, on a beach near a landing site, in June 2018. Another was a fresh harbour porpoise bycatch carried by a man who admitted that he would use it for own consumption (A.S.O.B., pers. observations).

It is unknown whether cetacean remains are used as fish bait in Mauritania.

Cape Verde Islands

In the 19th century American whalers took large numbers of humpback whales and sperm whales (reviewed in Cabral and Hazevoet, 2011) and some of the related habits, and specifically a taste for cetacean meat, seem to have lingered among Cape Verde islanders. Lopes (1929) (*in* Hazevoet and Wenzel, 2000) reported about two short-finned pilot whales stranded on Maio in the late 1920s: 'Their meat when salted and kept in barrels, is a true delicacy befallen to the island because it guarantees the alimentation of its inhabitants throughout the year'. Cabral and Hazevoet (2011) noted that there was a fishery for blackfish (*G. macrorhynchus*) operated from the Tarrafal whaling station until about 1920.

In more recent times, a humpback whale and calf were killed in 1977 and a juvenile rorqual was brought ashore by fishermen in 1983 (Table 1). And yet, despite an appreciable amount of cases of recent strandings, there is little specific information on the utilisation of small cetaceans by fishermen (e.g. Hazevoet and Wenzel, 2000; Reiner *et al.*, 1996;

Van Waerebeek *et al.*, 2008). Reiner *et al.* (1996) mentioned that 'cetaceans are occasionally captured and their meat is sold and consumed'. Also two cases of unidentified baleen whales were killed for their meat. Some melon-headed whales that mass-stranded in Boavista in 2007 were utilized as food; also the rostra of at least 5 specimens had been severed to extract teeth for locally made jewellery (Van Waerebeek *et al.*, 2008). In conclusion, cetacean meat is still consumed in the Cape Verde Islands at least occasionally when the opportunity arises, but there are no signs of any systematic utilisation, despite frequent live-strandings or animals in fresh condition. This conclusion coincides with Hazevoet *et al.* (2010) who stated that only few bycatches or purposeful catches had come to their attention and their incidence in Cabo Verde is apparently low at present.

Offshore areas

The former dolphin fishery at St Helena Island which mainly targeted *Stenella attenuata* and *Tursiops truncatus* (Perrin, 1985) is not further discussed as there are no recent data. Maigret (1981) suggested that tuna purse-seiners in the eastern tropical Atlantic (ETA) avoid to set on dolphin groups and that the only dolphins captured were these harpooned by the crew for consumption on-board. How wide-spread this harpooning habit was and is, is unknown. Considering important bycatches of delphinids in small scale gillnet fisheries for tuna, billfishes and sharks off Ghana (see reviewed below), there remains a suspicion that such captures also occur in the industrial tuna and swordfish fisheries in the ETA.

Senegal

The direct (D) and indirect (I) catches and utilisation of cetaceans as food in Senegal has been reported since the 1940s (e.g. Cadenat, 1947, 1949, 1954), and has been wide-spread ever since. Common dolphins were harpooned by Sereres and Niominka peoples of the Petite Cote and Siné-Saloum delta (Cadenat, 1947). For instance, some 50 common dolphins were captured in the Baie de Hann, near Dakar, in the summer of 1945 (Cadenat, 1949).

Maigret (1990) indicated that observations in 1977 showed catches of 2-3 dolphins each month in purse-seines off M'Bour, the most important fish unloading point on the Petite Cote. The animals are immediately cut up and eaten by the fishermen. About 30-50 dolphins (*Tursiops*, *Delphinus*, *Stenella*) are caught each year in this area of Senegal (Maigret, 1990).

The status around the early 2000s was studied by Van Waerebeek *et al.* (1997, 2000, 2003), to which we here refer. Captures and utilisation were found to be wide-spread, although frequently hidden, along the entire Senegalese coastline. Current and historical evidence was reviewed which found that at least 11 species have been used mostly as marine bushmeat, including *Phocoena phocoena* (I), *Sousa teuszii* (I), *Tursiops truncatus* (I,D), *Lagenodelphis hosei* (I), *Feresa attenuata* (I), *Peponocephala electra* (I), *Globicephala macrorhynchus* (D), *Orcinus orca* (D), *Stenella longirostris* (D), *Stenella clymene* (D), *Physeter macrocephalus*.

Also, traditionally, stranded large whales are readily flensed to the bone by large numbers of villagers and used mainly for food. At least sperm whale (e.g. Cadenat, 1956), Bryde's whale, minke whale (Van Waerebeek *et al.* 2003) and humpback whale (A. Djiba, pers. observations) are documented thus used in Senegal.

Other uses of cetaceans than food have only occasionally been recorded. Dolphin heads and other butcher remains were used as bait in a cephalopod fishery in Senegal (Van Waerebeek *et al.*, 1997). Humpback whale vertebrae have been seen used as stools in Kayar (A. Djiba, pers. observations).

By Ministry of Fisheries decree n° 97-1044 of 18 August 1987 "cetaceans of all species and all sizes " are protected animals in Senegal. While the decree does not specify the exact meaning of 'protected' it is often interpreted that even the possession of a by-caught dolphin carcass is against the law, although this could be contested. Hence the almost universal practice among fishermen of hiding dead cetaceans, even if accidentally entangled in the nets (Van Waerebeek *et al.*, 2000). A law extension stipulating specific guidelines on what should be done with by-caught specimens is recommended. For instance, legislation authorizing the local utilisation of by-caught animals (thus not permitting export), linked to a prior requirement to report the take to Fisheries Authorities, would provide a means to compile statistics on such takes, as well as permit biological research (Van Waerebeek *et al.*, 2000). This could be applicable to many West African coastal nations.

The Gambia

Initial insights were gained in 1998-2003 through field work coordinated by the Gambian Department of Parks and Wildlife Management and CMS/WAF CET projects (Murphy *et al.*, 1997; Jallow *et al.*, 2005; Van Waerebeek *et al.*, 2000, 2003). While there were no indications of substantial directed takes, it was recognised these occurred covertly. Most fishermen were aware of the legal protection of dolphins. Cetacean meat was a local commercial commodity and was sold and consumed covertly in several places, including Bakau, Banjul, Brufut and Tanji. At Albreda artisanal fishing village reportedly bottlenose dolphins became accidentally entangled in gillnets set for catfish, bonga and ladyfish (Van Waerebeek *et al.*, 2000, 2003). Confirmed captures and utilisation included the species *Tursiops truncatus*, *Sousa teuszii* and *G. macrorhynchus*. Four specific cases of dolphins being cut-up for human consumption were documented. One filleting instance witnessed by the senior author was done expertly and swiftly, which could only have resulted from abundant practice. Four *T. truncatus* were live-captured off Gunjur in 1951 (Van Waerebeek *et*

al., 2000). A project to start live-capturing *T. truncatus* from the Gambia river population for export was shelved about concerns of unsustainability.

A fishermen interview study in 2007-2012 suggested that the situation had not changed significantly (Leeney *et al.*, 2015) and these authors suggested that no sizeable market for the sale of dolphin meat had developed. At least a quarter of their respondents stated that they had accidentally caught a dolphin at least once. Bycaught animals were usually distributed amongst the community as food, but the meat and oil of dolphins were also used medicinally, to treat various ailments (Leeney *et al.*, 2015).

Guinea-Bissau

Guinea-Bissau is somewhat different from other WAF nations in that its coastal-dwelling population has no strong fishing tradition (Baran and Tous, 1999). Fishing is mainly an off-season activity for farmers, who fish either on foot using castnets or from dugout canoes very close to shore. In mangrove-rich areas and in the Bijagos Islands, molluscs gathered by women (mainly wild oysters *Crassostrea gasar*, arks *Anadara senilis* and murex shells *Murex* spp.) provide more protein than any other food in the local diet (Campredon and Cuq, 2001).

A single Atlantic humpback dolphin was documented caught in a fishing trap (Sequeira and Reiner, 1992). In 1997, although based on very little field effort, no evidence was found of directed or even incidental cetacean takes, and interviewed officials denied any regular by-catches (Van Waerebeek *et al.*, 2000). Utilisation of dead cetaceans around 2000 was also presumed to be negligible in Guinea-Bissau. However use of shark nets also meant high incidental catches of sea turtles and manatees (Almeida e Silva *et al.* 1999) and, while no mentioned, presumably also some dolphins.

More recently, the relative abundance of marine resources on this coast has attracted Guinean fishermen who come to southern Guinea-Bissau where they settle and join the shark fishing fleet. In the last 15 years, temporary camps have expanded and become more permanent settlements, and the fishermen have converted to ray and shark fishing solely for the fins. First-hand accounts tell about the depletion of sharks (Campredon and Cuq, 2001).

In 2007, large numbers of live *Tursiops truncatus* to be captured locally were planned to be irregularly exported from Bissau for the international captive trade industry by a German wildlife trafficker based on a flawed abundance estimate. Fortunately the trade could be halted with the help of CITES (Van Waerebeek *et al.*, 2008, 2016).

Leeney *et al.* (2016) updated species list for Guinea-Bissau but did not investigate utilisation.

Guinea

Presently firm evidence of utilisation of cetaceans is available for 10 individuals, namely 6 odontocetes and 4 mysticetes (Bamy *et al.*, 2010; Table 1) affecting five different species: *Sousa teuszii*, *Tursiops truncatus*, *Kogia breviceps*, *Balaenoptera acutorostrata* and *Balaenoptera brydei*. A bycatch of a *Peponocephala electra*, a first for Guinea, was confiscated by the fisheries authorities for study purposes (Bamy *et al.*, 2015) before it could be butchered. However data are registered opportunistically and one should realize that these numbers cannot reflect actual levels of cetacean utilisation. For instance among the remains of 7 delphinids found on the beaches of Tristao Island, northern Guinea, from 13-21 June 2017, only two (28.5%) could be ascertained from cut marks to have been at least partially cut-up by locals (Bamy *et al.*, 2017). However the close spatial association with the fishing villagers suggests that most of these specimens were fisheries victims and that several more of these had been utilised.

Bamy *et al.* (2015) suggested that the human consumption of fresh cetacean carcasses while wide-spread, does not occur at every occasion. Two stranded carcasses had apparently not been cut-up (Bamy *et al.*, 2015, 2017).

Sierra Leone

No cetacean species list is available for Sierra Leone and Perrin and Van Waerebeek (2012) could not confirm a single species. Also, no specific authenticated cases of captures and bushmeat/wildmeat use are known. Maigret (1994) stated that very infrequently, once or twice per year, 'porpoises' and manatees are entangled in polyamide ring-nets; they are dead before being disentangled and are consumed locally.

Moore *et al.* (2010) based on interviews-only reported that between 0% and 69% of fishermen interviewed in 2007-2008, region-dependent, claimed to have caught at least 1 cetacean per year, which suggested a conservative estimate of at least several hundred small cetaceans captured each year. No specific cases, no photos and no information on utilisation resulted but at least human consumption is likely.

Liberia

Little has been added since Maigret (1984) reported that almost nothing was known about fishery activities and marine mammal interactions in Liberia. No case studies of captures and bushmeat/wildmeat usage have been reported. This may be due, partly or entirely, to a lack of field research. A recent document (Van Waerebeek and Gray, 2019) reported 7 delphinid species sighted off northwestern Liberia which we suggest are susceptible to by-catch: *Globicephala macrorhynchus*, *Stenella attenuata*, *Stenella longirostris*, *Tursiops truncatus*, *Delphinus* sp., *Steno bredanensis*, *Grampus griseus*.

Côte d'Ivoire

The earliest information for Côte d'Ivoire dates from the 1960s when many delphinids, including *T. truncatus*, were harpooned off Vridi, for apparently scientific purposes (e.g. Rancurel, 1964; Purves and van Bree, 1972). In the 1990s in a driftnet fishery for tunas, swordfish and sharks, dolphins were caught incidentally. However with catches of marine mammals prohibited they were not declared but consumed by fishermen or buried on the beach (Maigret, 1994). We are unaware of any further historical or recent information on cetacean takes in Côte d'Ivoire. Interestingly, van Bree (1972) described a stranded false killer whale *Pseudorca crassidens* near Assini in March 1970 being venerated by local fishermen. They pulled the cetacean up the beach and exposed it in a hut for several days while they considered that the dolphin would . good luck with fishing. This veneration and associated customs are also known from eastern Ghana, Togo and Benin and provide some level of protection against hunting.

It is unclear whether humpback and sperm whales that strand on Côte d'Ivoire's coastline (Kothias and N'goran, 1991; Van Waerebeek *et al.*, 2017) are utilised, as they commonly are for instance in Ghana and Cameroon (see below).

Ship-based surveys in 2013-2014 showed that, due to large group sizes, melon-headed whale *Peponocephala electra*, Fraser's dolphin *Lagenodelphis hosei* and short-finned pilot whales are the most abundant species off Côte d'Ivoire (de Boer *et al.*, 2016) and probably fall victim in net entanglements, as confirmed in neighbouring Ghana.

Ghana

Considering significantly better information on the exploitation of cetaceans in Ghana (Van Waerebeek and Ofori-Danson, 1999; Ofori-Danson *et al.*, 2003; Debrah *et al.* 2010; Van Waerebeek *et al.*, 2014) we review these, and add new data in a separate document. At least 16 species are regularly or occasionally exploited, mainly through drift gillnetting and harpooning, especially in western Ghana: *Stenella attenuata*, *Stenella clymene*, *Stenella longirostris*, *Stenella frontalis*, *Globicephala macrorhynchus*, *Peponocephala electra*, *Lagenodelphis hosei*, *Feresa attenuata*, *Pseudorca crassidens*, *Tursiops truncatus*, *Delphinus sp.*, *Steno bredanensis*, *Grampus griseus*, *Kogia breviceps*, *Ziphius cavirostris*, and *Physeter macrocephalus*. Landings are systematic and not obstructed by fisheries authorities. Unfortunately, no statistics are kept neither and only the periodical surveying by the University of Ghana in collaboration with COREWAM (ngo) has provided insights. Use of cetaceans is both for human consumption, mostly in smoked form traded via the traditional bushmeat markets in the hinterland, and for fish bait. Occasionally net entangled *Megaptera novaeangliae* have also been utilised (Van Waerebeek *et al.*, 2009). *Sousa teuszii* has not been found in Ghana and is suggested to have been locally extirpated for years due to excessive captures and nearshore habitat deterioration (Ayissi *et al.*, 2014; Van Waerebeek *et al.*, 2009). Most *S. longirostris* spinner dolphins landed in Ghana belong to the unique West African 'spotted spinner' with spots on the belly and a pronounced post-anal keel in males, amongst other features, a form which was first described from four captured specimens in Senegal (Cadenat and Doutre, 1959; Cadenat, 1959).

Togo

The local Ewe people venerate aquatic mammals and sea turtles and bones are often conserved in shrines (Segniabeto *et al.*, 2014), moreover fisheries officers regularly inspect landings. However net-entangled cetaceans, as in other countries, are not discarded. Net entanglements of several species are documented: *Kogia breviceps*, *Globicephala macrorhynchus*, *Stenella attenuata*, *Delphinus sp.*, *Peponocephala electra*, *Balaenoptera bonaerensis*, *Megaptera novaeangliae*. All were either confirmed or presumed to have been utilised as marine bushmeat. In the past, stranded sperm whales and Bryde's whales (Segniabeto *et al.*, 2010, 2014) may also have been cut up although this cannot be confirmed. Some of the oil of a humpback whale was harvested for use as traditional medicine (Segniabeto *et al.*, 2014). Aquatic mammals in Togo are legally protected from capture (Article 13, Chapter 2) by the Pêche Maritime law No. 98-012 of 11 Jun 1998 (Segniabeto *et al.*, 2014), but nothing is said about their destination or use if the animals died accidentally from bycatch or after stranding. Despite often differing interpretations by port authorities, strictly legally people cannot be stopped to utilise the carcasses unless the cetaceans had been killed. This legal ambiguity exists in most West African coastal nations.

Benin

Little information is available on bycatch and utilisation of small cetaceans in Benin. Partly due to lack of awareness but partly also because authorities typically enforce legal protection measures and stop fishers from landing cetaceans, which pushes the practice into covert mode and difficult to detect. Article 79 of Benin's fisheries legislation² stipulates that 'The fishery, the holding and the commercialisation of any species of aquatic mammal or sea turtle are prohibited in the Republic of Benin'. Article 80 allows the Minister of Fisheries to formulate additional regulations for protected species. Based on interviews, it has long been suspected that some Nigerian and Ghanaian fishers who operate in

2 Article 79 : La pêche, la détention et la commercialisation de toute espèce de mammifères aquatiques ou de tortues marines sont interdites en République du Bénin;

Article 80 : Sous réserve des dispositions des conventions internationales, le ministre en charge de la pêche peut interdire ou soumettre à une réglementation particulière la capture, la détention et la commercialisation de toute espèce d'organisme aquatique protégé.

Beninese waters, especially in border areas, may export captured dolphins for sale in their respective countries, thus avoiding Beninese legislation.

Nonetheless, four odontocetes (*T. truncatus*, *G. macrorhynchus*, *Z. cavirostris*, *P. macrocephalus*) and the humpback whale (2 specimens) are documented utilised for human consumption in Benin (Sohou *et al.*, 2001, 2013; Sohou, 2011). A potentially captured species includes also *Pseudorca crassidens*.

Dolphins still enjoy a certain degree of protection among the Beninese coastal Xlwa people. Voodoo practitioners regard cetaceans as sacred (so-called *totems*) not to be hunted. Stranded cetaceans are often buried ceremonially. However findings suggest that traditional beliefs are gradually eroding and therefore stranded and by-caught cetaceans are increasingly considered a welcome source of protein (Sohou *et al.*, 2013). In 2001, the Cotonou port, Ayiguinnou and Agoué were known sites of dolphin trade for human consumption, but others have followed (Sohou *et al.*, 2001).

The Cuvier's beaked whale example, which was driven to shore shows that some alleged 'live-strandings' may in fact be direct takes. The real extent of cetacean captures and utilisation will not be revealed until a comprehensive nation-wide survey can be implemented (Sohou *et al.*, 2013) with the full collaboration of personnel of the national fisheries authorities. In Benin there are no clear indications for the use of cetacean carcasses as fish bait.

Nigeria

No historical record of cetacean catches exists for Nigeria. From interviews Solarin (2010) concluded, considering the lack of evidence, that dolphins were rarely caught or net-entangled in Nigerian waters. Moore *et al.* (2010) surveyed and interviewed Nigerian fishermen resulting in a 'reported [catch] incidence rate of 0.00', which they acknowledged is not credible. Interview-based approaches to assess marine mammal captures may be unreliable and necessarily should be supplemented with direct monitoring by trained observers. Landing site surveying indeed contradicted the presumed lack of takes (Uwagbae and Van Waerebeek, 2010; Van Waerebeek *et al.*, 2015). *Tursiops truncatus* and *Sousa teuszii* were documented captured and fully utilised both as bushmeat and fish bait (Uwagbae and Van Waerebeek, 2010; Van Waerebeek *et al.*, 2015, 2016, 2018). Other species that are likely captured because sighted in Nigerian coastal waters off Lagos (Olakunle and Akanbi, 2014) include *Delphinus delphis*, *Stenella attenuata*, and *Stenella frontalis*.

Babalola and Onatunji (2018) describe regular takes of dolphins in purse-seine nets for bonga fish at Ibagá community, Akwa Ibom State. The fishermen did not deliberately catch dolphins unless they find their way into the net during the process of hauling. All the groups of fishermen where sampling was conducted have killed dolphins in the previous years. Dolphins for damaging nets are considered a nuisance. Dolphins are locally consumed by a part of the fisher community, others dislike it. As in Ghana, much of it is smoked. Only one particular take was reported around February 2017 (Babalola and Onatunji, 2018). These authors believe that dolphin catches and their use are not illegal in Nigeria.

One of us (M.U.) collected field reports in the period 2008-2018 a few times a year in the coastal communities of the Niger Delta on the capture and killing of dolphins and small whales. Some 10–25 reports, mainly from direct eyewitness accounts and communications via local media, suggest that more than 50-100 dolphins and small whales may be killed by artisanal fishermen and dedicated 'dolphin hunters' every year in Brass and Akassa Islands and some other communities in the Niger Delta, from Delta State to Akwa Ibom State. Many cetaceans are used as bait in fisheries for shark and perhaps other fishes. These hunts target different dolphin species and are carried out in more than 10 coastal communities along the Niger delta, most especially in Bayelsa and Akwa Ibom States in Nigeria. Such illegal, unreported and unregulated (IUU) fisheries have unknown impacts on cetacean populations.

While hunting for human consumption has increased in the Niger Delta region due to the harsh economic situation in the country, the use of dolphins as bait in fisheries has been on the rise too. The meat from dolphins and small whales is considered optimal for bait due to its durability in the water, allowing it to remain attached to hooks even after extended periods of soaking, and because of its quality as a shark attractant due to its high blood and fat content. The hunting of small cetaceans is illegal in Nigeria, but appropriate control and rigorous enforcement in remote areas of the Niger Delta is weak and a flourishing black market has established, most especially on part of Brass island and the whole of Akassa Island.

While there are no specific cases documented, important dolphin bycatch rate (potentially *T. truncatus* and *Delphinus* sp.) are credibly reported also in the Nigerian artisanal purse-seine fishery for bonga fish (*Ethmalosa fimbriata*), especially in the Akwa Ibom State. First estimates suggest that at peak bonga season, about two dolphins may die per three operational sets (Ambrose and Obienu, 2016; Babalola and Onatunji, 2018).

New evidence exists for captures of four Atlantic humpback dolphins and one bottlenose dolphin, all used for human consumption or indeterminate use (wild meat) in 2017-2018 (M.U., unpub. data).

Lewis and Moore (2012) from interview surveys concluded that the capture of dolphins in fishing gear was similarly widespread but less commonly reported in Lagos than the other two states and less common in towed nets than the other gears. E.g., in Ogun and Ondo, 47% and 39% of fishers who used gillnets as their principal gear reported catching

dolphins and caught 4.4 and 2.7 per year on average in that gear (plus additional catch in secondary gears). In Lagos state, however, only 3% of gillnet fishers reported catching dolphins and caught 1.5 per year. For those who primarily fished with tow nets, 5% of fishers in Lagos caught an average of 1.5 dolphins per year and 8% of fishers in Ondo caught an average of 2.8 dolphins per year (tow nets were not observed in the Ogun communities). For purse-seine fishers (Ghana boats), 20% of respondents in Lagos caught 4 dolphins per year, and 0.83 of fishers in Ogun reported catching an average of 2.1 per year (there were no Ghana boats observed in Ondo). Point estimates for total annual catch of marine mammals was 10,890 dolphins. The mean of the 10,000 bootstrap estimates was 10,822 with SE = 3108 (CV = 0.29) and 95% CI = 5,211 – 17,347. Problematic however, there is no documented evidence of any of these catches.

Also Lewison and Moore (2012) while listing 16 marine mammal species captured, some confirmed to be present by others (see above), several species have not been documented from Nigeria and one reported species, the Mediterranean monk seal (*Monachus monachus*), is not even distributed in the Gulf of Guinea. Lewison and Moore (2012) admit, the species identifications by fishers were not verified and "must be viewed with caution". We would like to add that such "identifications" are inherently unreliable and should not be used until voucher evidence becomes available.

One small humpback whale which stranded in fresh condition on Saint Nicholas Island (off Brass Island) in the Niger Delta was butchered by locals. Another whale, stranded in Fish town community beach at Akassa Island in August 2018 was also cut-up for food. Considering the frequent strandings of whales on the Nigerian coast, estimated at about 4-10 recorded strandings per year, most of these are probably utilised. However getting evidence including photos has been difficult due to safety issues of the water ways in the Niger Delta. Also when requesting specifics from fishermen they typically demand money before divulging any information. There is much to learn about the extent and composition of small cetacean captures in Nigerian waters.

Cameroon

We found no historical evidence and the earliest indication for the use of cetacean bushmeat in Cameroon was dolphin meat served as meal at Sittan *ca.* 2000 (Ayissi, pers. observations). Reportedly the dolphin was taken by a trawler (*chalutier*) but this could not be verified (Ayissi *et al.*, 2011).

Moore *et al.* (2010) noted that only 15% of fishermen in Fako reported taking at least 1 cetacean per year; in the other regions (Wouri, Sanaga Maritime) fishermen reported no by-catches or only 1% of them did so (Ocean Province). Our coastal surveys (Ayissi *et al.*, 2011; Van Waerebeek *et al.*, 2017) revealed that at least six species have been utilised for human consumption: *Sousa teuszii*, *Tursiops truncatus*, *Stenella coeruleoalba*, *Delphinus sp.*, *Megaptera novaeangliae* and *Physeter macrocephalus*. All animals had died from net entanglement, except maybe the sperm whales (3 cases). Another potentially used species includes generic 'spotted dolphins' -often described by fishermen. Also stranded humpback and sperm whales are typically flensed and distributed for human consumption.

We conclude that all cetacean species that are by-caught or taken intentionally, and probably all individuals, are utilised. Two confirmed sites of human consumption are Kribi and Suellaba.

Ayissi *et al.* (2018) also suggested that virtually all captured marine mammals and sea turtles are used for human consumption. Indeed, we found no observational evidence that demonstrates the use of cetacean carcasses for fish bait, albeit it is suspected. Ayissi and Jiofack (2014) reported the capture of 97 cetaceans in Cameroon, both bycatch and intentional takes, and they believed that all catches are consumed by the fishermen.

One striped dolphin had been found bisected (Ayissi *et al.*, 2011). Recently in Ghana bisected dolphins were seen with some regularity, where one half body is destined as food and the other half is used for shark bait.

São Tomé and Príncipe

Takes of small cetaceans are not documented for São Tomé and Príncipe but oral information given by fishermen attest to their occasional capture (Brito *et al.*, 2010). Three reported incidents of unidentified small cetacean captures were referred to Sao Tomé (port), Neves and Angolares (Brito *et al.*, 2010) but no specifics were available. Nothing is documented on potential utilisation. *Stenella attenuata* and *T. truncatus* are the most commonly encountered small cetaceans in São Tomean coastal waters (Brito *et al.*, 2010; Picanço *et al.*, 2009) and hence are the most probable to fall victim to by-catch. Pilot whale, killer whale and sperm whale were also sighted by Picanço *et al.* (2009), but surely short-finned pilot whale *G. macrorhynchus* and not *G. melas* is involved as reported. The latter species does not occur in the Gulf of Guinea.

Equatorial Guinea

To our knowledge no field research has focussed on the utilisation of cetaceans in Equatorial Guinea and we found no published information. Also, no comprehensive faunal checklist of cetaceans exists for the country. Perrin and Van Waerebeek (2012) listed 4 species that have been reported to occur (*Stenella attenuata*, *S. frontalis*, *Feresa attenuata* and *Orcinus orca*). A future species list is anticipated to be highly similar to that of Cameroon (Ayissi *et al.*, 2011), considering very similar marine habitats.

The aboriginal whaling in Pagalu or Annobón Island, as described by Aguilar (1985) may have left locals a potential tradition and tendency to consume cetaceans, much as in the Cape Verde Islands.

CONCLUSION

Documented records of cetacean utilisation in WAF are limited for most nations due to the fact that strong limiting factors exist that render any data collection difficult, among which :

- (i) cetacean utilisation is illegal or considered illegal in most nations. Therefore a strong resistance exist against divulging any specific evidence of utilisation as it may contain forensic or legally compromising information;
- (ii) no official by-catch and catch statistics of cetaceans are maintained in any WAF nation;
- (iii) absence of systematic dedicated survey effort by academics or NGOs. At best information is gathered opportunistically and/or temporarily and in one or a few ports /landing sites. This precludes reliable estimates nation-wide and at annual scale.
- (iv) captured cetaceans are often landed and traded covertly (at nighttime, away from main landing site, etc.) for fear of confiscation and fines;
- (v) even when a catch is detected by fisheries officers, the probability of reporting is low, also considering that technical expertise (e.g. for species identification) is insufficient.
- (vi) general public awareness about the issue is extremely limited.

We did not find any published evidence of specific cases of small cetacean utilisation for 6 nations of the study region (Morocco, Western Sahara, Guinea Bissau, Sierra Leone, Liberia, São Tomé and Príncipe, and Equatorial Guinea). For Côte d'Ivoire mainly historical (20th century) harpooning for scientific purposes have been reported. For some of the nations considered this absence may reflect a genuine lack of human consumption and fishing bait use of cetaceans (e.g. Western Sahara, Morocco), while for some others (e.g. Sierra Leone, Liberia, Côte d'Ivoire) it is suspected that the main reasons for the absence of specific data of cetacean bycatch and utilisation may simply reside in non-reporting and the scarcity of survey effort.

For seven nations (Mauritania, Cape Verde Islands, The Gambia, Guinea-Bissau, Guinea, Togo, Benin) there are clear indications for the occasional to more regular (but not systematic) use of cetacean carcasses for human consumption, although again lack of good data impedes a satisfactory insight into the issue.

Sufficient evidence demonstrates that in four nations (Ghana, Nigeria, Cameroon and Senegal) the utilisation of fresh cetacean carcasses either from fisheries or strandings, ranges from being the norm and wide-spread in most parts of the coast to virtually 100% use. Directed takes are common in at least Ghana and Nigeria, and suspected in several other nations.

Although cetaceans are legally protected to varying degrees in most WAF coastal nations, both by national legislation and through ratification of multiple international conventions (e.g. CBD, CMS, Abidjan Convention, CITES, etc.) national legislation is often formulated in overly concise and sometimes vague terms, devoid of explanatory notes. Specifically the legality of the utilisation of dead cetaceans resulting from by-catch or strandings is highly ambiguous and different stake holders may hold and apply different interpretations. Existing legislation generally would benefit from a critical revision and updating. Whether dead cetaceans under certain circumstances should be allowed to be used for consumption or otherwise, may require a nation-wide public debate, as diverse and complex aspects (biological, fisheries management, socio-economic, cultural, public health) need to be considered.

Occasionally the argument of public health has been handled against utilisation in case of cetacean strandings, but not necessarily with success considering the many examples of flensed stranded cetaceans in at least 6 nations (Senegal, Guinea, Ghana, Togo, Benin, Cameroon), and the few known instances where access was effectively blocked. Community-based knowledge may actually relativise the potential danger to public health and may view the access to large quantities of free protein as more important. A single case was registered where villagers had consumed non-fresh meat of a sperm whale, and had fallen ill (Ayissi *et al.*, 2011). Wilcox and Nambu (2007) point out that bushmeat, as a source of protein supplementation, is often significantly cheaper than alternative sources of protein available and is therefore highly attractive.

Regionally at least 23 species are known to be captured-utilised or stranded-utilised, including 19 odontocetes and 4 baleen whales. The exploitation in Ghana, the best documented, involves a sizable subset of these, 18 species or 78%.

Species that are known to be affected include: *Phocoena phocoena*, *Stenella attenuata*, *Stenella clymene*, *Stenella longirostris*, *Stenella frontalis*, *Stenella coeruleoalba*, *Globicephala macrorhynchus*, *Peponocephala electra*, *Lagenodelphis hosei*, *Feresa attenuata*, *Pseudorca crassidens*, *Tursiops truncatus*, *Sousa teuszii*, *Delphinus* spp., *Steno bredanensis*, *Grampus griseus*, *Kogia breviceps*, *Ziphius cavirostris*, *Physeter macrocephalus*. Among baleen whales feature *Megaptera novaeangliae*, *Balaenoptera acutorostrata*, *B. bonaerensis*, *B. brydei*.

Arguably, the species with the greatest threat to its long-term survival caused by captures is *Sousa teuszii* (Van Waerebeek and Perrin, 2007b; Weir *et al.*, 2011; Collins, 2015; Van Waerebeek *et al.*, 2015). The important fisheries caused mortality of the African population of *P. phocoena* in Mauritanian waters, although carcasses are not systematically utilised, is also of great concern (Mulli  *et al.*, 2013; this paper).

The large majority of landed cetacean carcasses are destined for human consumption (marine bushmeat). The use of cetaceans as fishing bait, and then mainly shark bait, seems still relatively limited and we could confirm this practice only in Ghana and Nigeria, and (in early 2000s) in Senegal. However, indications are that demand for bait is on the rise at least in Ghana (Ofori-Danson *et al.*, 2019). Globally, two-thirds of aquatic mammal species used as bait are utilized in shark fisheries. An increase in the demand for shark products, particularly for fins, has led to an increase in shark fishing effort and landings worldwide (Clarke *et al.*, 2007; Debrah *et al.*, 2010; Mintzer *et al.* 2018). However authentication of the use of cetaceans as bait is even less well-documented because carcasses of by-caught animals are often butchered in the canoes, used immediately with any evidence disappearing. Only vessel-based monitoring would effectively record such events.

One potential mechanism to vastly improve data collection and build catch statistics would consist in the compulsory reporting of all cetacean catches to fisheries officers who could then photograph the specimens as voucher and identification. They would also need to check whether the animals died accidentally or were killed. In return the declared dolphins would be allowed to be utilised if accidental death is confirmed. Regular controls by maritime police or naval personnel would allow seizing specimens that have not been declared upon landing, or which were hunted (showing harpoon, lance or other suspicious injuries). Seized animals could be granted to local public institutions (schools, hospitals, etc.) and to academics for biological research.

ACKNOWLEDGEMENTS

Many fisher communities contributed to the collection of information and kindly offered hospitality to field workers, for which we thank them dearly. The International Whaling Commission is thanked for supporting some of the authors to attend the 2019 IWC Scientific Committee Meeting in Nairobi.

REFERENCES

- Aguilar, A. 1985. Aboriginal whaling off Pagalu (Equatorial Guinea). Reports of the International Whaling Commission 35: 385-386.
- Alfaro-Shigueto J. and Van Waerebeek K. 2001. Drowning in the sea of silence: the bushmeat concept applied for marine fauna. Zoos and Aquariums committing to Conservation, Symposium hosted by Brevard Zoo, 28 Nov.–2 Dec. 2001, Orlando, Florida. p16.
- Almeida e Silva, M., Araujo, A., Djedjo, F., Gomes, L. and Monteiro, H. 1999. Plano nacional de conserva o do Manatim africano (*Trichechus senegalensis*) na Guin  Bissau. UICN-Instituto para a Conserva o da Natureza, Bissau.
- Ambrose E. and Obienu J. (2016): Outline for the reduction of incidental capture of Dolphins in Bonga Purse Seine Fishery in Nigeria. *Pyrex Journal of Biodiversity and Conservation*. 1(4): pp 44 – 46.
- Amon Kothias, J.-B. And N’goran, N.Y. 1991. Note sur les baleines echou es en estuaires artificiels en C te d’Ivoire. *J. Ivoir. O anol. Limnol. Abidjan* 1(2) : 153-155.
- Ayissi I., Van Waerebeek K. and Segniagbeto G. (2011) Report on the Exploratory survey of cetaceans and their status in Cameroon. Document UNEP/CMS/ScC17/Inf.10, 17th Meeting of the CMS Scientific Council, 17-18 November 2011, Bergen, Norway. http://www.cms.int/sites/default/files/document/Inf_10_Rpt_Cameroon
- Ayissi, I, Segniagbeto, G.H. and Van Waerebeek, K. (2014) Rediscovery of Cameroon Dolphin, the Gulf of Guinea Population of *Sousa teuszii* (K kenthal, 1892). *ISRN Biodiversity* 2014, 1-6. DOI: 10.1155./2014/819827.
- Ayissi, I, and Fourier, T (2018). Status of African Manatee (*Trichechus senegalensis* Link, 1795) along Cameroon Coastline: Uncertain Future. *J Marine Sci Res Dev* 8: 256. doi:10.4172/2155-9910.1000256
- Ayissi I, Makoge RE, Nack J, Nyeck N, Mpeck ML, *et al.* (2018) Characterization of Marine Artisanal Fisheries and the Impact of By-Catch on Marine Faunal in Southern Cameroon (West-Africa). *J Aquac Fisheries* 3 (010) : 1-6.
- Babalola F.D. and Onatunji A. B. (2018): *Social Implication of Artisanal Seine Practice on Dolphins in Ibagu Fishing Community*. Akwa Ibom, Nigeria. pp. 372-376. In: Proceedings of the 6th Nigerian Society for Conservation Biology, Biodiversity Conference, University of Uyo, Akwa Ibom State, Nigeria.
- Ayissi I, and Jiofack TJE (2014) Impact assessment on by-catch artisanal fisheries: Sea turtles and mammals in Cameroon, West Africa. *Fish Aquac J*. 5: 099.
- Bamy I.L., Van Waerebeek K., Bah S.S., Dia M., Kaba B., Keita N. and Konate S. (2010) Species occurrence of cetaceans in Guinea, including humpback whales with southern hemisphere seasonality. *Marine Biodiversity Records* 3 (e48): 1-10. doi:10.1017/S1755267210000436
- Bamy, I.L., Djiba, A., Van Waerebeek, K. (2017) A new survey of dolphins (Delphinidae) in the Tristao Islands, Guinea, augments concern for their conservation. Final Report to United Nations Development Programme UNDP, July 2017, Conakry, Guin .

- Bamy, I.L., Oulare, A. and Soumah, N.L. 2015. Menaces sur des petits cétacés rencontrés sur les côtes guinéennes. *Bull. Centre Halieutique de Boussoira* 5 (1-2) : 24-31.
- Baran, E. and Tous, P. 1999. Pêche artisanale, développement et cogestion durables des ressources. Analyse d'un succès en Afrique de l'Ouest. IUCN, Bissau (unpublished).
- Brashares, J. S., Arcese, P., Sam, M. K., Coppolillo, P. B., Sinclair, A. R., & Balmford, A. (2004). Bushmeat hunting, wildlife declines, and fish supply in West Africa. *Science*, 306 (5699): 1180-1183.
- Brito, C., and Carvalho, I. 2013. Blackfish off Cape Verde Islands: the need for future effort to assess distribution, abundance and interactions with human activities. In: Atas do colóquio Internacional Cabo Verde e Guiné-Bissau: Percursos do Saber e da Ciência. Lisboa: Instituto de Investigação Científica Tropical.
- Brito, C., Picanço, C., Carvalho, I. 2010. Small cetaceans off São Tomé (São Tomé and Príncipe, Gulf of Guinea, West Africa): species, sightings and abundance, local human activities and conservation, Document SC/62/SM8, IWC Scientific Committee. 14pp.
- Busnel, R.G. 1973. Symbiotic relationship between man and dolphins. *Trans. New York Academy of Science*, Ser. 11, 35(2): 112-131.
- Cabral, J.J, and Hazevoet, C.J. 2011. The last whale: rise and demise of shore-based whaling in the Cape Verde Islands. *Zoologia Caboverdiana* 2(1): 30-36.
- Cadenat, J. 1947. Observations de Cétacés au Sénégal. *Notes Africaines* 34: 20-34.
- Cadenat, J. 1949. Notes sur les Cétacés observés sur les côtes du Sénégal de 1941 à 1948. *Bulletin de l'IFAN* 11: 1-15.
- Cadenat, J. 1954. Echouage d'un cachalot sur les côtes du Sénégal. *Notes Africaines* 64: 119-121.
- Cadenat, J. 1955. A propos d'un échouage de baleine a Dakar. *Notes Africaines* 67: 91-94.
- Cadenat, J. 1956. A propos de cachalot. *Notes Africaines* 71:82-92.
- Cadenat, J. (1959). Rapport sur les petits cétacés ouest-africains. Resultats des recherches entreprises sur ces animaux jusqu'au mois de mars 1959. *Bulletin de l'I.F.A.N.* T.XXI, sér. A, n°4: 1367-1409.
- Cadenat, J., Doutre, M. (1959). Notes sur les Delphinidés ouest-africains. V. Sur un *Prodelphinus* à long bec capturé au large des côtes du Sénégal *Prodelphinus longirostris* (Gray) 1828? *Bulletin de l'I.F.A.N.* T.XXI, sér. A, n° 2: 787-792.
- Campredon, P. and Cuq, F. 2001. Artisanal fishing and coastal conservation in West Africa. *J Coast Conserv* (2001) 7: 91. <https://doi.org/10.1007/BF02742471>
- Clapham, P. and Van Waerebeek, K. (2007) Bushmeat, the sum of the parts. *Molecular Ecology* 16: 2607-2609.
- Clarke, S., Milner-Gulland, E. J., and Bjørndal, T. 2007. Social, economic, and regulatory drivers of the shark fin trade. *Mar. Resour. Econ.* 22, 305–327. doi: 10.1086/mre.22.3.42629561
- Collins T. 2015. Re-assessment of the conservation status of the Atlantic humpback dolphin *Sousa teuszii* (Kükenthal,1892), using the IUCN Red List Criteria. In: (eds.) T. A. Jefferson and B. E. Curry, *Advances in Marine Biology*, Vol. 72, Oxford: Academic Press: 47-77.
- Consentino, A.M. and Fisher, S. 2016. The Utilization of Aquatic Bushmeat from Small Cetaceans and Manatees in South America and West Africa. *Frontiers in Marine Science* 3:163.
- de Boer M.N., Saulino J.T., Van Waerebeek K., Aarts G. (2016). Under Pressure: Cetaceans and Fisheries co-occurrence off the Coasts of Ghana and Côte d'Ivoire (Gulf of Guinea). *Frontiers in Marine Science* 3:178. DOI: 10.3389/fmars.2016.00178
- Debrah, J.S. 2000. Taxonomy, exploitation and conservation of dolphins in the marine waters of Ghana. Master of Philosophy thesis, Department of Oceanography and Fisheries, University of Ghana. 86pp. (unpublished).
- Debrah J.S., Ofori-Danson P.K. and Van Waerebeek K. (2010) An update on the catch composition and other aspects of cetacean exploitation in Ghana. Scientific Committee Document SC/62/SM10, International Whaling Commission Meeting, Agadir, Morocco, June 2010. doi: 10.13140/RG.2.1.4537.9928
- Diallo, S.T., Bah, F.B. and Sow, M. 2007. La prise accidentelle d'un dauphin *Tursiops truncatus* (Montagu, 1821) au large de Conakry. *Bull. Centre National des Sciences Halieutiques de Boussoira* : 65-66.
- Duguay, R. 1976. Contribution à l'étude des mammifères marins de la côte nord-ouest Afrique. *Revue des Travaux de l'Institut des Pêches maritimes* 39(3): 321-332.
- Gnandi, K. and Tobschall, H.J. (1999). The pollution of marine sediments by trace elements in the coastal region of Togo caused by dumping of cadmium-rich phosphorite tailing into the sea. *Environmental Geology* 38(1) : 13-xx.
- Hazevoet C.J. and Wenzel, F.W. 2000. Whales and dolphins (Mammalia, Cetacea) of the Cape Verde Islands, with special reference to the humpback whale *Megaptera novaeangliae* (Borowski, 1781). *Contributions to Zoology* 69(3): 197-211.
- Hazevoet C.J., Monteiro V., López P., Varo N., Torda G., Berrow S., Gravanita B. 2010. Recent data on whales and dolphins (Mammalia: Cetacea) from the Cape Verde Islands, including records of four taxa new to the archipelago. *Zoologia Caboverdiana* 1(2): 75-99.
- Ikpa, T.F., Dera, B.A., Jande, J.A. 2009. Biodiversity conservation: why local inhabitants destroy habitat in protected areas. *Science World Journal* 4 (4): 22-27.
- International Hydrographic Organisation. 1953. Limits of Oceans and Seas. Special publication N°28. Monte Carlo, Monaco.

- Jallow A.O., Cham A.M., Barnett L.K. and Van Waerebeek K. (2005) Conservation of cetaceans in The Gambia: Whale and Dolphin Field Research. pp. 37-54. In: (ed.) L. Barnett. Proceedings from the First Biodiversity Research Symposium The Gambia, May 2005. Darwin Initiative Project, The Gambia.
- Jefferson T.A., Curry, B.E., Leatherwood S., and Powell, J.A. (1997) Dolphins and porpoises of West Africa: a review of records (Cetacea: Delphinidae, Phocoenidae). *Mammalia* 61: 87-108.
- Jung J.-L., Mullié W.C., Van Waerebeek K., Wagne M.M., Samba Ould Bilal A., Ould Sidaty Z.A., Toomey L., Méheust E. and Marret, F. 2015. Omura's whale off West Africa: autochthonous population or inter-oceanic vagrant in the Atlantic Ocean? *Marine Biology Research* 2015. doi: 10.1080/17451000.2015.1084424
- Koenen F., Magileviciute E., Rodrigues J. and Hazevoet C.J. 2013. First confirmed occurrence of Gervais' beaked whale *Mesoplodon europaeus* (Gervais, 1855) in the Cape Verde Islands. *Zoología Caboverdiana* Vol. 4(2):49-52.
- Leeney, R.H., Dia, I.M., Dia, M. (2015) Food, pharmacy, friend? Bycatch, direct take and consumption of dolphins in West Africa. *Human Ecology*. DOI 10.1007/s10745-015-9727-3.
- Leeney, R.H., Weir C.R., Campredon, P., Regalla, A., Foster, J. 2016. Occurrence of Atlantic humpback (*Sousa teuszii*) and bottlenose (*Tursiops truncatus*) dolphins in the coastal waters of Guinea-Bissau, with an updated cetacean species checklist. *Journal of the Marine Biological Association of the United Kingdom* 96(4): 933-941.
- Lewison, R., and Moore, J. 2012. Improving Interview-Based Assessments of Sea Turtle and Marine Mammal Bycatch in West Africa: Putting Fishing Activity into A Socio-Economic Context. Project Report, San Diego State University and Southwest Fisheries Science Center, NOAA, 81.
- Maigret, J. 1981. Rapports entre les cétacés et la pêche thonière dans l'Atlantique tropical oriental. *Notes Africaines* 171: 75-84.
- Maigret, J. 1990. Relationship between marine mammals and the fisheries on the West African coasts. Document SC/090/G5 presented to the Scientific Committee of the International Whaling Commission. 16pp.
- Maigret, J. 1994. Marine mammals and fisheries along the West African coast. *Rep.Int.Whal. Commn.* (special issue 15): 307-316.
- Masski, H. and De Stephanis, R. 2015. Cetaceans of the Moroccan coast: information from a reconstructed strandings database. *J. Marine Biological Association UK*, 1-9. doi:10.1017/S0025315415001563
- Moore J.E., Cox T.M., Lewison R.L., Read A.J., Bjorkland R., et al. (2010) An interview-based approach to assess marine mammal and sea turtle captures in artisanal fisheries. *Biological Conservation* 143: 795–805. doi: 10.1016/j.biocon.2009.12.023
- Mintzer VJ, Diniz K and Frazer TK. (2018) The Use of Aquatic Mammals for Bait in Global Fisheries. *Front. Mar. Sci.* 5:191. doi: 10.3389/fmars.2018.00191
- Mullié W.C., Wagne M.M., Ahmed Ahmed Elmamy C., Mint Yahya F., Veen J. and Van Waerebeek K. 2013. Large number of stranded harbour porpoises *Phocoena phocoena* as by-catch victims in Mauritania. Scientific Committee document SC/65a/HIM03, International Whaling Commission, Jeju, Korea, June 2013. 5pp.
- Murphy, P., Van Waerebeek, K. & Jallow, A. 1997. Cetaceans from Gambian coastal waters. Paper SC/49/SM11 presented to IWC Scientific Committee. (Unpublished, available from IWC Secretariat, Cambridge, UK).
- Nieri M., Grau E., Lamarche B., and Aguilar A. 1999. Mass mortality of Atlantic spotted dolphins (*Stenella frontalis*) caused by a fishing interaction in Mauritania. *Marine Mammal Science* 15(3) 847-854.
- Notarbartolo di Sciarra G., Politi E., Bayed A., Beaubrun P.C., Knowlton A. 1998. A winter cetacean survey off Southern Morocco, with a special emphasis on suitable habitats for wintering right whales. *Reports of the International Whaling Commission* 48:547-550.
- Notarbartolo di Sciarra, G., Van Waerebeek, K. and Whale and Dolphin Society. 2017. Proposal for a Concerted Action for the Atlantic Humpback Dolphin (*Sousa teuszii*) already listed on Appendix I and II of the Convention. Document UNEP/CMS/COP12/Doc.26.2.3, Manila, Philippines, 23-28 Oct 2017. 9pp.
- Ofori-Danson P.K., Van Waerebeek K. and Debrah S. (2003) A survey for the conservation of dolphins in Ghanaian coastal waters. *Journal of the Ghana Science Association* 5(2): 45-54.
- Olakunle, G.W. and Akanbi, W.B. 2014. Occurrence and species diversity of delphinids off-Lagos shore, Nigeria. *Int. J. Biol. Chem. Sci.* 8(6): 2578-2587.
- Perrin, W.F. 1985. The former dolphin fishery at St Helena. *Reports of the International Whaling Commission* 35: 423-428.
- Perrin W.F. and Van Waerebeek K. 2012. The small-cetacean fauna of the West coast of Africa and Macaronesia: diversity and distribution. pp. 7-17. In: (ed.) K. Van Waerebeek. *Conserving cetaceans and manatees in the western African region. CMS Technical Series No. 26.*
- Picanço, C., Carvalho, I., & Brito, C. (2009). Occurrence and distribution of cetaceans in São Tomé and Príncipe tropical archipelago and their relation to environmental variables. *Journal of the Marine Biological Association of the United Kingdom*, 89(5), 1071-1076. doi:10.1017/S0025315409002379
- Purves, P.E. and van Bree, P.J.H. (1972) Evolution and the pathology of deep diving in the bottlenosed dolphin, *Tursiops truncatus* (Montagu, 1821) (Notes on Cetacea, Delphinoidea V). *Beaufortia* 260 (20): 15-21.

- Rancurel, P. 1964. Note sur la plongée profonde de *Tursiops truncatus*. Cahiers ORSTOM (Océanographie) 2(4): 135-141.
- Reiner, F., dos Santos ME, Wenzel, FW. 1996. Cetaceans of the Cape Verde Archipelago. Marine Mammal Science 12: 434-443.
- Robards, M. D., and Reeves, R. R. (2011). The global extent and character of marine mammal consumption by humans: 1970–2009. Biol. Conserv. 144, 2770–2786. doi: 10.1016/j.biocon.2011.07.034
- Robineau, D. 1995. A propos de la prétendue symbiose entre les pêcheurs Imragen de Mauritanie et les dauphins. *Mammalia* 59(3): 460-463.
- Rose, A.L. 1998. Growing commerce in bush meat destroys great apes and threatens humanity. African Primates 3 : 6-10.
- Rowcliffe, J.M., Milner-Gulland, E.J., Cowlishaw, G. 2005. Do bushmeat consumers have other fish to fry? Trends in Ecology and Evolution 20(6): 274-276.
- Segniagbeto G. and Van Waerebeek K. (2010) A note on the occurrence and status of cetaceans in Togo. Document SC/62/SM11, IWC SC Meeting, Agadir, Morocco, June 2010. <http://dx.doi.org/10.13140/RG.2.1.3751.5600>
- Segniagbeto G.H., Van Waerebeek K., Bowessidjaou E.J., Ketoh K., Kpatcha T.K., Okoumassou, K. and Ahoedo, K. (2014). Annotated checklist and fisheries interactions of cetaceans in Togo, with evidence of Antarctic minke whale in the Gulf of Guinea. *Integrative Zoology*: 378-390. <http://dx.doi.org/10.1111/1749-4877.12011>
- Sequeira, M. and Reiner, F. 1992. First record of an Atlantic humpback dolphin, *Sousa teuszii* Kükenenthal, 1892 (Cetacea; Delphinidae) in Guinea-Bissau. *Mammalia* 56(2): 311-313.
- Sohou, Z. 2011. Baleines et dauphins; Whales and dolphins. pp. 278-284. In: Neuenschwander, P., Sinsin, B. & Goergen, G. (eds). Protection de la Nature en Afrique de l'Ouest: Une Liste Rouge pour le Bénin. Nature Conservation in West Africa: Red List for Benin. International Institute of Tropical Agriculture, Ibadan, Nigeria.
- Sohou, Z., Nobimé, G. and Tchibozo, S. 2001. Recherche sur les cétacés dans les eaux béninoises et sur le littoral. Rapport Technique, Centre Béninois pour le Développement Durable, Cotonou. 6pp. (unpublished)
- Sohou, Z., Dossou-Bodjrenou, J., Tchibozo, S., Chabi-Yaouré, F., Sinsin, B. and Van Waerebeek, K. 2013. Biodiversity and Status of Cetaceans in Benin, West Africa: an Initial Assessment. *West African Journal of Applied Ecology* 21(1): 121-134. <https://www.researchgate.net/publication/256082309>
- Solarin, B.B. (2010). Status of small cetaceans in Nigeria. Document SC/62/SM12 presented to IWC Scientific Committee Annual Meeting, 6pp.
- Trouillet B, Guineberteau T, Bernardon M, Le Roux S. 2011. Key challenges for maritime governance in West Africa: Fishery-based lessons from Guinea and Mauritania. *Marine Policy* 35: 155-162.
- Tudela, S., Kai Kai, A., Maynou, F., El Andalossi, M. and Guglielmi, P. (2005). Driftnet fishing and biodiversity conservation: The case study of the large-scale Moroccan driftnet fleet operating in the Alboran Sea (SW Mediterranean). *Biological Conservation*. 121. 65-78. 10.1016/j.biocon.2004.04.010.
- UNEP-CMS. 2008. Action Plan for the Conservation of Small Cetaceans of Western Africa and Macaronesia. In: Annex II to the Memorandum of Understanding Concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia. CMS - Convention on the Conservation of Migratory Species of Wild Animals. Available at <http://www.cms.int/en/document/action-plan-conservation-small-cetaceans-western-africa-and-macaronesia> [last access 8 November 2018].
- Uwagbae M. and Van Waerebeek K. (2010) Initial evidence of dolphin takes in the Niger Delta region and a review of Nigerian cetaceans. IWC Scientific Committee document SC/62/SM1, Agadir, Morocco, June 2010. 8pp.
- van Bree, P.J.H. 1972. Sur la présence de *Pseudorca crassidens* (Owen, 1846) [Cetacea, Globicephalinae] au large des côtes d'Afrique occidentale. *Bulletin de l'IFAN*, 34A (1): 212-218.
- Van Waerebeek, K, Diallo, M, Djiba, A, Ndiaye, P, and Ndiaye, E. 1997. Cetacean research in Senegal 1995–97, an overview. Document SC/49/SM10 presented to the Scientific Committee of the International Whaling Commission, Bournemouth, UK.
- Van Waerebeek K., André M., Sequeira M., Martin V., Robineau D., Collet A., Papastavrou V. and Ndiaye E. (1999) Spatial and temporal distribution of the minke whale *Balaenoptera acutorostrata* Lacépède 1804 in the southern Northeast Atlantic and the Mediterranean Sea, with comments on stock identity. *Journal of Cetacean Research and Management* 1(3): 223-237.
- Van Waerebeek, K. and Ofori-Danson, P.K. 1999. A first checklist of cetaceans of Ghana, Gulf of Guinea, and a shore-based survey of interactions with coastal fisheries. IWC Scientific Committee document SC/51/SM35, 51st Annual Meeting, May 1999, Grenada. 9pp.
- Van Waerebeek K., Ndiaye E., Djiba A., Diallo M., Murphy P., Jallow A., Camara A., Ndiaye P. and Tous P. 2000. A survey of the conservation status of cetaceans in Senegal, The Gambia and Guinea-Bissau. WAF CET-1 Report, UNEP/CMS Secretariat, Bonn, Germany. 80pp.
- Van Waerebeek, K., Barnett, L., Camara, A., Cham, A., Diallo, M., Djiba, A., Jallow, A.O., Ndiaye, E., Samba Ould Bilal, A.O. & Bamy, I. L. 2003. Conservation of Cetaceans in The Gambia and Senegal 1999-2001, and Status of the Atlantic humpback dolphin. WAF CET-2 Report, UNEP/CMS, Bonn, Germany. 55 pp.

- Van Waerebeek K, Tchibozo S, Montcho J, Nobime G, Sohou Z, Sohouhou P, Dossou C (2001) The Bight of Benin, a North Atlantic breeding ground of a Southern Hemisphere humpback whale population, likely related to Gabon and Angola substocks. Paper SC/53/IA21 presented to the Scientific Committee of the IWC, London, July 2001. 8pp. (Unpublished).
- Van Waerebeek K. and Perrin W.F. 2007a. Conservation status of the Clymene dolphin in West Africa. CMS/ScC14/Doc.5, 14th Meeting CMS Scientific Council, Bonn, Germany, 14-17 March 2007.
- Van Waerebeek K. and Perrin W.F. 2007b. Conservation status of the Atlantic humpback dolphin, a compromised future? CMS/ScC14/Doc.6, 14th Meeting CMS Scientific Council, Bonn, Germany, 14-17 March 2007. 10pp.
- Van Waerebeek K., Bamy I.L., Jiddou A.M., Sequeira M., Diop M., Ofori-Danson P.K., Tchibozo S. and Campredon P. (2008) Indeterminate status of West African populations of inshore common bottlenose dolphins *Tursiops truncatus* cautions against opportunistic live-capture schemes. Technical Report to the Fondation Internationale du Banc d'Arguin (FIBA). 9pp. DOI:10.13140/RG.2.1.2772.0801
- Van Waerebeek K., Hazevoet C.J., López-Suárez P., Delgado Rodrigues M.S. and Gatt G. 2008. Preliminary findings on the mass strandings of melon-headed whale *Peponocephala electra* on Boavista Island in November 2007, with notes on other cetaceans from the Cape Verde Islands. Technical Report to the Fondation Internationale du Banc d'Arguin (FIBA). 9pp. DOI:10.13140/RG.2.1.2596.9763
- Van Waerebeek K., Debrah J.S., Ofori-Danson P.K. (2014) Cetacean landings at the fisheries port of Dixcove, Ghana in 2013-14: a preliminary appraisal. Scientific Committee Document SC/65b/SM17, International Whaling Commission Annual Meeting, Bled, Slovenia, 12-24 May 2014. 4pp. doi: <http://dx.doi.org/10.13140/RG.2.1.4079.2401>
- Van Waerebeek K., Uwagbae M., Segniagbeto G., Bamy I.L. and Ayissi I. (2015) New records of Atlantic humpback dolphin in Guinea, Nigeria, Cameroon and Togo underscore fisheries pressure and generalised marine bushmeat demand. *BioRxiv/2015/035337*. <http://dx.doi.org/10.1101/035337>
- Van Waerebeek, K., Ofori-Danson, P.K., Debrah, J., Collins, T., Djiba, A., Samba Ould Bilal, A. 2016. On the status of the common bottlenose dolphin *Tursiops truncatus* in western Africa, with emphasis on fisheries interactions, 1947-2015. Document SC/66b/SM19 presented to the Scientific Committee of the International Whaling Commission, Bled, Slovenia, June 2016. 19pp. DOI: <http://dx.doi.org/10.13140/RG.2.1.4159.1287>
- Van Waerebeek K., Uwagbae M., Segniagbeto G., Bamy I.L. and Ayissi I. (2017) New records of Atlantic humpback dolphin (*Sousa teuszii*) in Guinea, Nigeria, Cameroon and Togo underscore fisheries pressure and generalised marine bushmeat demand. *Revue d'Ecologie (Terre et Vie)* 72(2): 192-205.
- Van Waerebeek K., Baker A.N., Félix F., Gedamke J., Iñiguez M., Sanino G.P., Secchi E., Sutaria D., van Helden A. and Wang Y. (2007) Vessel collisions with small cetaceans worldwide and with large whales in the Southern Hemisphere, an initial assessment. *Latin American Journal of Aquatic Mammals* 6(1): 43-69.
- Van Waerebeek, K. and Gray, H. 2019. Diversity and relative density of cetaceans in coastal waters of Liberia, based on a geophysical survey. Document submitted to IWC Scientific Committee, Nairobi, May 2019.
- Weir, C.R. 2010. A review of cetacean occurrence in West African waters from the Gulf of Guinea to Angola. *Mammal Review* 40(1): 2-39.
- Weir CR. 2016. Atlantic humpback dolphins *Sousa teuszii* in the Saloum Delta (Senegal): distribution, relative abundance and photo-identification. *African Journal of Marine Science* 38(3): 385-394.
- Weir, C.R. and Pierce, G.J. 2012. A review of the human activities impacting cetaceans in the eastern tropical Atlantic. *Mammal Review*: 1-17.
- Weir, C.R., Debrah, J., Ofori-Danson, P.K., Pierpoint, C., Van Waerebeek, K. (2008) Records of Fraser's dolphin *Lagenodelphis hosei* Fraser, 1956 from the Gulf of Guinea and Angola. *African Journal of Marine Science* 30(2): 241-246.
- Weir C., Van Waerebeek K., Jefferson T.A. and Collins T. (2011). West Africa's Atlantic humpback dolphin: endemic, enigmatic and soon Endangered? *African Zoology* 46(1): 1-17.
- Wilcox, A.S., and Nambu, D.M. 2007. Wildlife hunting practices and bushmeat dynamics of the Banyangi and Mbo people of Southwestern Cameroon. *Biological Conservation* 134(2): 251-261.