

## The cetaceans of Guinea, a first check-list of documented species

Idrissa L. Bamy<sup>ψ</sup>, Koen Van Waerebeek<sup>Ω</sup>, S. Sounounou Bah<sup>Φ</sup>, Mamadou Dia<sup>Π</sup>, Samba T. Diallo<sup>Π</sup>,  
Bangaly Kaba<sup>¶</sup>, Namoury Keita<sup>Φ</sup>, Sékou Konate<sup>¶</sup> and Hassimiou Tall<sup>ψ</sup><sup>1</sup>

### Abstract

A CMS workshop on West African Cetacea (Conakry, May 2000), called for i.a. ‘carrying out .. inventory of cetacean species; collection, treatment and compilation of data for each state.’ The present paper is a preliminary faunal check-list of cetaceans occurring in Guinea’s EEZ. Information was gleaned from strandings, bycatches, scientific and opportunistic sightings and a literature review. Ten species are included for which supporting voucher material and data were available for examination. These are, three baleen whales: *Balaenoptera brydei*, *Balaenoptera acutorostrata* and *Megaptera novaeangliae*; and seven species of odontocetes: *Kogia breviceps*, *Tursiops truncatus*, *Sousa teuszii*, *Stenella frontalis*, *Delphinus delphis*, *Steno bredanensis* and *Globicephala macrorhynchus*. Another two species, *Physeter macrocephalus* and *Stenella attenuata* were sighted off Guinea but no photographic evidence was obtained. The current account is thought to reflect an incomplete picture of Guinea’s cetacean biodiversity. Future surveys are expected to update and investigate spatial and temporal distribution patterns for each species along Guinea’s coast. A few bycatches landed by artisanal fishers were utilised locally, but there are no signs of any substantial captures. Nonetheless, monitoring should be continued. The set-up of a national reference collection and database is recommended. The population identities of the encountered Atlantic humpback dolphin, minke whale and humpback whale are of particular interest.

### Résumé

Un atelier CMS sur les Cétacés de l’Afrique Occidentale (Conakry, mai 2000) a réclamé, entre autres, ‘la mise en oeuvre d’un inventaire des espèces; collection, traitement et compilation des données pour chaque état.’ Le papier actuel est une liste faunistique préliminaire des cétacés présents dans la ZEE de la Guinée. L’information a été relevée des échouages, des captures accidentelles, des observations scientifiques et opportunistes et d’une revue de littérature. Dix espèces sont incluses pour lesquelles spécimens et données de soutien étaient disponibles pour être examiner. Celles-ci sont, trois baleines à fanons *Balaenoptera brydei*, *Balaenoptera acutorostrata* et *Megaptera novaeangliae*; et sept espèces d’odontocètes: *Kogia breviceps*, *Tursiops truncatus*, *Sousa teuszii*, *Stenella frontalis*, *Delphinus delphis*, *Steno bredanensis* et *Globicephala macrorhynchus*. Deux autres espèces, *Physeter macrocephalus* et *Stenella attenuata* ont été observées au large de la Guinée mais aucune évidence photographique n’a été obtenue. On pense que la liste actuelle reflète une image inachevée de la biodiversité des cétacés de la Guinée, et on s’attend à ce que d’autres campagnes mettent à jour et étudient les modèles spatiaux et temporels de distribution pour chaque espèce le long de la côte de la Guinée. Quelques captures accidentelles débarquées par des pêcheurs artisanales sont utilisées localement, mais il n’y a aucun signe de captures substantielles. Néanmoins, la surveillance côtière devrait être continuée. L’installation d’une collection et d’une base de données nationales de référence est recommandée. Les identités de population du dauphin à bosse Atlantique, du petit rorqual et de la baleine à bosse méritent de l’intérêt particulier.

<sup>1</sup> <sup>ψ</sup> Centre national des Sciences Halieutiques de Boussoura (CNSHB), BP-3738 Boussoura, Conakry, Guinea

<sup>Φ</sup> Direction nationale de la Protection de la Nature, Ministère de l’Environnement, Conakry, Guinea

<sup>Π</sup> Direction Nationale des Eaux et Forêts, Ministère de l’Agriculture, de l’Elevage et des Forêts, Conakry, Guinea

<sup>¶</sup> Centre de Recherches Océanographiques de Rogbané (CERESCOR), BP 561 Rogbané, Conakry, Guinea

<sup>Ω</sup> CEPEC, Museo de Delfines, Pucusana, Lima 20, Peru. Email: cepec@speedy.com.pe

## Introduction

A regional, CMS<sup>2</sup>-sponsored workshop held in Conakry, Guinea, 8-12 May 2000, was devoted to the Conservation and Management of small cetaceans of West Africa. Earlier approved by the 8<sup>th</sup> meeting of the Scientific Council in Wageningen in June 1995, it was subsequently adopted by the COP in Geneva in April 1996. The workshop, organised by the Guinean Ministry of Agriculture, among other objectives aspired to develop a series of recommendations to allow the states of the region to 'develop an Action Plan that integrate to the maximum the fishing community, exploitation of the sea, and local communities, moderate the threats to slowly reproducing marine species and the destruction of their habitat, assuring their conservation and renewal with a view to equilibrium between their existence and development of the states'. In the short term, the Conakry cetacean workshop called for, i.a.: 'carrying out of observations of dolphins, and surveillance and regulation of fisheries; inventory of cetacean species; collection, treatment and compilation of data for each state.' (CMS, 2000; Archer and Van Waerebeek, 2000). Progress has been continuous, with emphasis on new data acquisition and field work, primarily in Senegal, The Gambia, Guinea-Bissau, Ghana, Togo and Benin (e.g. Jallow *et al.*, 2005; Van Waerebeek and Ofori-Danson, 1999; Van Waerebeek, 2003a,b; Van Waerebeek *et al.*, 2000, 2001, 2003), but also in Guinea (S.T. Diallo *et al.*, 2002, 2004; this paper). Advances in regional planning appeared less obvious while coping with a lack of funding and competition from higher priority issues. However, exchange of information and expertise between scientists and other stakeholders, a stated aim at Conakry-2000, has significantly improved. Also, Guinean authorities have reiterated their interest in coordinating further actions.

This paper covers preliminary results of ongoing cetacean inventory work by Guinean scientists, and serves as a token of continued involvement despite limited resources. Guinea has ratified most conventions which are relevant to cetacean management and conservation (CBD, CITES, CMS, IWC, Ramsar and UNCLOS).

No published papers are available which describe the composition and the spatial and temporal distribution of dolphins and whales in Guinea's coastal waters. In the meantime, large-scale trophic and ecosystem studies (e.g. I. Diallo *et al.*, 2004) are left with no alternative than to rely on hypothetical, not factual, cetacean faunal structure and distribution, albeit conducive to inaccurate or even erroneous interpretations.

A May-July 1984 survey by the Soviet *R/V Evrika* off Guinea mapped five sightings of unidentified dolphins within the 200m isobath (two groups within the 20m isobath) and a whale sighting in the 200-500m zone (Anonymous, 1984). Information generated by recent cetacean surveys between Conakry and Dakar

from the Guinean *R/V Général Lansana Conté* has not yet been published (S.T. Diallo *et al.*, 2002, 2004). A comprehensive review of the status and ecology of the Atlantic humpback dolphin *Sousa teuszii* in West Africa, including Guinea, was recently completed (Van Waerebeek *et al.*, 2003, 2004).

At an informal but wide consultation among pertinent institutions in Guinea in April 2006, it was agreed to complete a first compilation of authenticated cetacean records. This collaborative effort serves as base for the set up of a national database and reference collection of marine mammals. The present preliminary cetacean check-list is the direct result of this initiative.

## Material and methods

Among technical requisites for drafting meaningful management and conservation measures for marine living resources, an inventory of taxa that constitute ESUs<sup>3</sup> present in EEZ waters, is evidently primordial. Primary material for our inventorial task consisted of cetacean records authenticated by either voucher specimens, photographs and/or detailed descriptions of observed diagnostic features. A cetacean taxonomist (KVV) confirmed identifications. Biological data were gleaned from beachings, strandings, scientific and opportunistic sightings and from a critical review of literature. Occasional bycatches also generated some useful information. This first checklist is necessarily incomplete but will be updated periodically with newly documented evidence. To that purpose, the authors welcome contributions from the scientific community at large.

Specific records are discussed as specimens and sightings. In 2001 and 2003, the *Centre National des Sciences Halieutiques de Boussouira* (CNSHB) has monitored fish landing sites for accidental bycatches of dolphins, amongst other species. Increasingly, whale strandings, some of which may occur due to rapidly receding tides, are regarded as useful opportunities to collect biological data economically. A majority of whale strandings (lately at least twice per annum), have taken place in estuaries, such as the estuary at Koukouba, prefecture of Kanfarandé, in Boké. This shallow area is hazardous also to ships which regularly strand on sand banks.

## Physical characteristics of the Guinean coast

Guinea, an Atlantic country bordered by *ca.* 300km of dynamic coastline (Figure 13), features a tropical climate characterized by alternating dry and rainy seasons. Thanks to physical factors including shallow waters, a strong tidal regime and pronounced seasonal pluviosity, large parts of the littoral of Guinea, much like its northern neighbour Guinea-Bissau, provides a prime environment for extensive mangrove forests. Guinea's continental shelf of almost 43,000km<sup>2</sup> represents the greatest submerged surface of the West African coast (Rougeron, 1996). Its width varies from 87 nmiles in the south to 104 nmiles in the north.

<sup>2</sup> Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

<sup>3</sup> ESU or Evolutionary Significant Unit (i.e. species, subspecies, populations or stocks)

Considering sedimentology (Postel, 1955; Domain and Bah, 1993), Guinea's seabed consists of muds and sandy muds, containing terrigenous particles deposited by the rivers. Beyond the 20m isobath, sand bottoms predominate. On the edge of the old submarine valleys, outcrops of hard substrate are found. The sea bottom, especially in the north, is characterized by the presence of 'ridins', exposed rock formations up to 5m high and thus very hazardous to bottom trawling.

In the rainy season (April-November), the winds are generally directed in a southwesterly direction and warm water (Guinea Current) flows towards the northern part of the continental shelf. Sea surface temperatures vary from 28-29°C. Surface salinity exceeds 32.0‰ on the coast to quickly reach 35.5‰ further offshore. At greater depth, salinity is higher than at the surface in rainy season and than nearshore.

## Authenticated cetacean records

### Odontoceti

#### Atlantic humpback dolphin *Sousa teuszii*

**Specimens:** The only documented specimen record from Guinea is a 222cm male landed as bycatch by artisanal fishers at Dixinn, Mansabo district, in the Bay of Sangaréah, on 13 March 2002. It was sampled by the senior author (see Van Waerebeek *et al.*, 2004).

**Sightings:** Van Waerebeek *et al.* (2003, 2004) summarized the distribution of *S. teuszii* in Guinea as follows: "French biologist, J. Cadenat (1956a) reported [literal translation from French]: '... the characteristic shape of the dorsal fin of this species and its colour pattern [...] make me think today that the delphinids which showed exactly these characteristics and which I could observe in January 1953 in the silt-laden inshore waters of French Guinea, south of Conakry, must also belong to the species *Sotalia teuszii*' (p. 558). Cadenat was familiar with Atlantic humpback dolphins from his work in Senegal, and he is one of only a few biologists to have examined fresh carcasses. His account is, therefore, considered credible. There are no additional sightings reported, possibly due to a paucity of effort. Guinea's coast features prime *Sousa* habitat—that is, shallow coastal waters (0-40 m), an up to 200km wide continental shelf (Chavance *et al.*, 1998), and extensive creeks and mangrove forest around four main river mouths: (1) Río Komponi, (2) Río Nuñez, (3) Fatala, and (4) Konkouré. The Konkouré Estuary has been a recognized Ramsar wetlands site (No. 575) since 1992."

**Status:** Unknown. The few records from Guinea have provisionally been referred to as a 'South Guinea' management stock (Van Waerebeek *et al.*, 2004). The Dixinn case is the only documented bycatch in Guinea. However, in April 2006 some fishermen at Sangaréah Bay indicated (pers. comm. to ILB and KVV) that this species occasionally becomes entangled in their nets.

#### Common bottlenose dolphin *Tursiops truncatus*

**Specimens:** An adult, female common bottlenose dolphin (Figure 1), landed in fresh condition at Bonfi, Salétougou (SE coast, near the border with Sierra

Leone) on 10 March 2002, showed net marks on its anterior body. It was examined by the senior author who deposited the skull at CNSHB (Figure 1). Body length was 340cm, which is one of the larger *T. truncatus* specimens, similar as in Senegal (up to 368cm, see Robineau and Vély, 1997). Despite damaged occipital condyli, minimum condylobasal length was 556mm (compare: adult CBL 540-610mm in Senegal, Robineau and Vély, 1997; 504-578mm, in southern Africa and up to 330cm SL; Ross, 1984).



Fig. 1. Common bottlenose dolphin *Tursiops truncatus* showing marks caused by a net; its skull is deposited at CNSHB (Photos ILB, KVV).

**Sightings:** Common bottlenose dolphins were sighted and photographed in a January-February 2004 cetacean survey off West Africa, including Guinea (T. Diallo *et al.*, 2004).

**Status:** The Bonfi specimen (see above) is the only known case of bycatch.

#### Pygmy sperm whale *Kogia breviceps*

**Specimens:** A 345cm female pygmy sperm whale (Figure 2) was landed by a local fisherman at the Dabondy landing site on 3 May 2002. The animal, examined by ILB, was caught near Tanéné. Moussa Sylla photographed the carcass. The partial skeleton is currently deposited at CNSHB. The vertebrae show fused epiphyses but fusion lines remain visible; condylobasal length is 401mm. This is the first record of the pygmy sperm whale for Guinea.



Fig.2. Bycaught pygmy sperm whale landed at Dabondy (Photo ILB).

**Sightings:** No sightings of kogiids have been reported.

**Status:** No information is available. The Dabondy specimen, the only known *Kogia* bycatch in Guinea, was utilised for human consumption. The fishermen suffered the loss of their net. A suggestion that the

animal might have been injured before entanglement, is not supported by evidence.



Fig. 3. Pygmy sperm whale skull from Dabondy, deposited at CNSHB (Photo KVV).

**Atlantic spotted dolphin *Stenella frontalis***

*Specimens:* None available.

*Sightings:* First reported in Guinea waters on 9 December 2002 (S.T. Diallo *et al.*, 2002). The photo (Figure 4) of a heavily spotted mature individual is from the same waters but not necessarily of this group.

*Status:* population status in West Africa has not been assessed.



Fig. 4. Atlantic spotted dolphin *Stenella frontalis* bowriding (photo courtesy I. Yoshimura). Note the characteristic light shoulder blaze swooping up towards the dorsal fin. Also, the large size of both dorsal and pectoral fins (*versus* small in *S. attenuata*).

**Rough-toothed dolphin *Steno bredanensis***

*Specimens:* None available.

*Sightings:* A group of some 65 individuals was observed on 31 January 2004 (S.T. Diallo *et al.*, 2004). The photo (Figure 5) is thought to be from another group sighted in the same general area. Note the large dorsal and pectoral fins, a marked dorsal cape narrowing before the dorsal fin, and a long rostrum.

*Status:* no information available.

**Short-finned pilot whale *Globicephala macrorhynchus***

*Specimens:* None available.

*Sightings:* Several. A first group was reported in Guinea waters on 9 December 2002 (S.T. Diallo *et al.*, 2002). Photo (Figure 6) was taken during the 2004 survey at an indeterminate location in the same general



Fig. 5. Rough-toothed dolphins *Steno bredanensis* off Guinea. (Photo courtesy I. Yoshimura).

area. Identification to species level was made at sea by S.T. Diallo *et al.* (2002). Close encounters in calm seas (Figure 6) may allow good views of the relative size of pectoral fins and permit distinction between short-finned and long-finned species. Although the cool-water adapted *G. melas* is not documented from south of Mauritania (Nores and Pérez, 1988; Van Waerebeek *et al.*, 2000) its precise southern distribution limit remains uncertain.

*Status:* no information on status is available.



Fig. 6. A short-finned pilot whale *G. macrorhynchus* (Photo courtesy I. Yoshimura). Note the very large, hooked, dorsal fin placed anteriorly relative to the middle point of the dorsum.

**Short-beaked common dolphin *Delphinus delphis***

*Specimens:* None available.

*Sightings:* Several groups were reported in Guinea waters on 6 February 2004 (S.T. Diallo *et al.*, 2004). Photo (Figure 7) is not necessarily one of these.

*Status:* No data. Great care should be taken in correctly distinguishing this species from the long-beaked common dolphin *Delphinus capensis*, which, besides *D. delphis*, has also been recorded from Senegal and The Gambia (Van Waerebeek *et al.*, 2000). Samaai *et al.* (2005) document morphological variation in *Delphinus* spp. from South Africa



Fig. 7. Short-beaked common dolphin *Delphinus delphis* in Guinean waters (Photo courtesy I. Yoshimura).

## Mysticeti

### Bryde's whale *Balaenoptera brydei*

*Specimens* : (i) A 980cm long Bryde's whale stranded alive at Kassa, Ile de Loos, on 29 July 2002. Its skeleton is exhibited outside at CNSHB headquarters.



Fig. 8. Bryde's whale stranded at Kassa.

in Conakry (Figure 9). Diagnostic are a combination of osteological characteristics: maxillae with nearly parallel borders proximally, concave nasal bones, very curved and robust mandibles, thoracic vertebrae with short neural processes.

Its stomach contents examined *in situ* revealed the presence of osseous fishes (Teleostei) and squid beaks but no prey species were identified. The whale reportedly run ashore alive in daytime during a stormy period.



Fig. 9. Bryde's whale skeleton from Kassa (Photo KVV)

(ii) Another Bryde's whale, of 13m length (Figure 11) stranded on 21 May 2001 near Koukoubaya, sub-prefecture of Kanfarandé in northern Guinea. It was examined by Bamy and L. Camara Youssouf.

*Sightings*: Bryde's whales were sighted with some regularity during a 2004 survey off Conakry and north to Dakar (Diallo *et al.*, 2004).

*Status*: No bycatches reported. Olsen (1913) described *B. brydei* from Bryde's whales taken off the Cape Province, South Africa, which are most likely conspecific with the Bryde's whales found off Guinea.



Fig. 10. Baleen plate (21.5 x 6.5cm) of minke whale from Bay of Tobounsou.



Fig. 11. Skull (ventral view) of Bryde's whale from Kanfarandé.

### Minke whale *Balaenoptera acutorostrata*

*Specimens*: A single baleen plate (21cm long, 6.5cm wide), yellowish in colour with a brownish leading edge and short, fine bristles, is kept as voucher (Figure 10) taken from a minke whale of unknown sex. According to a local newspaper<sup>4</sup> the whale was accidentally netted in the Bay of Tabounsou and landed in March 1986. It was examined by one of us (B. Kaba). Its reported body length (9m) indicates an adult individual.

*Sightings*: No minke whale sightings have been reported from Guinean waters.

*Status*: The individual of Tabounsou is the only minke whale bycatch on record for Guinea. The date suggests a winter record of some North Atlantic stock.

### Humpback whale *Megaptera novaeangliae*

*Specimens*: The highly decomposed (state 4) anterior body of a humpback whale washed ashore at Boulbinet, Conakry on 26 September 2005 (Figure 12). The tail and tail stock of the body was missing. Long flippers with prominent bumps on leading edge and low number of ventral pleats (estimated 14-17 from photos) are diagnostic for humpback whale. The cause of death is unknown but since the animal stranded in the vicinity of Conakry port and was incomplete, a vessel collision in the area is not excluded. Humpback whales however are not known to be carried long distances stuck on the bow of vessels like other, more streamlined, balaenopterids sometimes are.

*Sightings*: Till date, no live humpback whales have been reported in Guinean waters.

*Status*: Unknown. Either the animal is a member of the Northeast Atlantic population that overwinters (breeds) off Cape Verde Archipelago (Reiner *et al.*, 1996) between September and April. Alternatively it may be Southern Hemisphere whale. The stranding date (September) coincides well with the period (August-

<sup>4</sup> Anonymous, 1986. Une baleine dans la Baie de Tabounsou. *Horoya*. Organe d'information de la République de Guinée. vendredi 22 Août 1986. p.1 and 5.

November) when southern hemisphere humpback whales seasonally move into nearshore waters of the northern Gulf of Guinea for calving/breeding, at least as far west as Ghana (Van Waerebeek *et al.*, 2001; Van Waerebeek, 2003) and Ivory Coast (Sedzro Kossi W., Dépt. Pêches, Lomé, pers.comm. to KVV). We hypothesize that some individuals may reach Liberia, Sierra Leone and even southern Guinea. September is characterised as a period of minimum upwelling off Guinea (I. Diallo *et al.*, 2004).



Fig. 12. A highly decomposed humpback whale, a first record, stranded on Conakry's shores, in September 2005.

#### Unidentified balaenopterid

With the help of Guinean Navy personnel, Bamy collected cranial and some postcranial parts of an unidentified balaenopterid stranded in October 2001 in the area of Kamsar. Initially deposited at CNSHB, the skeletal parts however were taken to France.

#### Discussion

This check-list provides authenticated specimen records for ten cetacean species, seven odontocetes and three mysticetes, that are shown to occur in Guinean waters. Two other odontocetes have been sighted off Guinea (S.T. Diallo *et al.*, 2004) at an unspecified location, the sperm whale *Physeter macrocephalus* and pantropical spotted dolphin *Stenella attenuata*, but no photos are available. This first faunistic list for Guinea's Cetacea is almost certainly incomplete, and several other tropical delphinids, some ziphiids and other balaenopterids are expected to occur.

The species documented here have also been reported from neighbouring waters, off Senegal and The Gambia (Van Waerebeek *et al.*, 2002, 2003). No mass strandings have been recorded in Guinea.

Over the past decade, national fisheries have developed rapidly. In 1995, some 75,300 MT (69% artisanal, by 2,300 canoes) of fish products were landed in Guinea (Chavance *et al.*, 1998). Despite this, there are very few documented records of bycatches. Limited port monitoring for cetacean landings may partly be blamed, but efforts have so far not encountered any indications of wide-scale dolphin bycatches or direct captures. Moreover Guinea's Fisheries Code (*Code de la Pêche*) stipulates in its Article 35 that any capture of a marine mammal is prohibited<sup>5</sup>.

The stranding of a minke whale adds to the existing evidence (Van Waerebeek *et al.*, 1999) that minke whales occur in low numbers off West Africa at least as far south as Senegal, possibly seasonally (winter). Their range is now extended further south to include Guinea.

A national specimen reference collection and database is proposed as to pool and maximise resources. The CERESCOR institute would be ideal considering its ample space and because it already holds many other marine biological samples and specimens.

#### Acknowledgements

Isamu Yoshimura is thanked for the use of photographs. KVV thanks Jackie Van Goethem (Leopold III Fonds voor Natuuronderzoek en –Behoud) for airfare support.

#### References

- Anonymous, 1984. Compte-rendu sur les résultats de recherches halieutiques obtenus lors de la campagne du NS "Evriska" menée dans les eaux de la République de Guinée de 12 mai à 4 juillet 1984. Institut Atlantique de recherches scientifiques de l'Industrie des Pêches et l'Océanographie (AtlantNIRO). Unpublished report, Kalinigrad [In French].
- Archer, E. and Van Waerebeek, K. 2000. Workshop in Guinea-Conakry on the conservation and management of marine mammals in West Africa. *CMS Bulletin* 11: 12-13.
- Cadenat, J. 1956. Un delphinidae encore mal connu de la côte occidentale d'Afrique: *Sotalia teuszii* Kükenthal 1892. *Bulletin de l'IFAN* 18A : 555-566.
- Chavance, P., Diallo, A., Diallo, M., Domain, F., Drapeau, L., Fautrel, V., Guilavogui, A., Morize, E., Solié, K., and Traoré, S. 1998. *Atlas des Pêches Maritimes de Guinée 1997*. Conakry: République de Guinée, Ministère de la Pêche et de l'Élevage. 25 pp.
- CMS, 2000. Rapport sur la Conservation et la gestion des petits cétacés de la Côte d'Afrique. Atelier, Conakry, Guinée, 8-12 May 2000.
- Diallo, I., Cissé, I., Bah, A. 2004. Modèle trophique du système système côtier du plateau continental Guinéen, p. 113-123. In: Palomares, M.L.D., Pauly, D. (eds.) West African marine ecosystems: models and fisheries impacts. Fisheries Centre Research Reports 12(7). Fisheries Centre, UBC, Vancouver.
- Diallo, S.T., Yoshida, H., Samoura, A.B., Sow, M., Camara, M., Bah, F.B., Monteiro, V., Fall, M., Da Fonseca, L.M., Almeida, A.F., Rerambyath, G.A. 2002. Campagne d'observation des cétacés dans les eaux cotières de l'Afrique du Nord Ouest (de la Guinée au Sénégal), 7-23 décembre 2002. Rapport de Mission, CNSHB, Ministère de la Pêche et de l'Aquaculture, République de Guinée. Unpublished report. (in French).
- Diallo, S.T., Bah, F.B., Sow, M., Camara, Y., Cissé, M., Monteiro, V., Sylla, S., Da Fonseca, L.M., Almeida, A.F.M., Rerambyath, G.A., Yoshimura, I. and Yoshida, H. 2004. Campagne d'observation des cétacés dans les eaux cotières de l'Afrique du Nord

<sup>5</sup> « La chasse et la capture de toutes espèces de mammifères marins sont interdits en tous temps et en tous lieux. ».

- Ouest (de la Guinée au Sénégal), 23 janvier au 10 février 2004. Rapport de Campagne, CNSHB, Ministère de la Pêche et de l'Aquaculture, République de Guinée. Unpublished report (in French).
- Domain, F. and Bah, M.O. 1993. Carte sédimentologie du plateau continental guinéen. Edit. ORSTOM; Paris, 15 pp.
- Jallow, A., Cham, A.M., Barnett, L. and Van Waerebeek, K. 2005. Conservation of cetaceans in The Gambia: whale and dolphin field research. pp. 37-54. *In: Proceedings from the First Biodiversity Research Symposium The Gambia*. Ed. L. Barnett, Makasufu Wildlife Trust, Darwin Initiative Project, The Gambia.
- Nores, C. and Pérez, C. 1988. Overlapping range between *Globicephala macrorhynchus* and *Globicephala melaena* in the northeastern Atlantic. *Mammalia* 52 (1): 51-55.
- Olsen, Ø. 1913. On the external characters and biology of Bryde's whale (*Balaenoptera brydei*), a new rorqual from the coast of South Africa. *Proc. Zool. Soc. London* 1913:1073-1090.
- Reiner, F., dos Santos, M.E. and Wenzel, F. 1996. Cetaceans of the Cape Verde Archipelago. *Mar. Mamm. Science* 12(3): 434-443.
- Robineau, D. and Vély, M. 1997. Données préliminaires (taille corporelle, craniométrie) sur le grand dauphin (*Tursiops truncatus*) des côtes d'Afrique du Nord-ouest (Mauritanie, Sénégal). *Mammalia* 61(3) : 443-448.
- Ross, G.J.B. 1984. The smaller cetaceans of the south east coast of southern Africa. *Ann. Cape Prov. Mus. (nat. Hist.)* 15(2) : 173-410.
- Rougeron, N. 1996. Etude de la répartition spatiale des ressources démersales du plateau continental guinéen. Relation avec le benthos et l'environnement physique. Mémoire de D.E.A, Ecole Nationale Supérieure Agronomique de Rennes, France, 27 pp. Unpublished thesis (in French).
- Van Waerebeek, K. 2003a The Atlantic humpback dolphin: In retreat? *CMS Bulletin* 17:10-11.
- Van Waerebeek, K. 2003b A newly discovered stock of humpback whales in the northern Gulf of Guinea. *CMS Bulletin* 18: 6-7.
- 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. *J. Cet. Res. Manag.* 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. Paper SC/51/SM35, Annual Meeting, IWC, May 1999, Grenada. 9pp.
- Van Waerebeek, K., Barnett, L., Camara, A., Cham, A., Diallo, M., Djiba, A., Jallow, A.O., Ndiaye, E., Samba Ould Bilal, A.O. and Bamy, I. L. 2004. Distribution, status and biology of the Atlantic humpback dolphin *Sousa teuszii* (Kükenthal, 1892). *Aquatic Mammals* 30(1): 56-83.
- 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. 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 and Status of the Atlantic humpback dolphin in The Gambia and Senegal, 1999-2001. WAF CET-2 Report. UNEP/CMS, Bonn, Germany. 55 pp.
- Van Waerebeek, K., Tchibozo, S., Montcho, J., Nobime, G., Sohhou, Z., Sohhouhou, P. and 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 International Whaling Commission, London, July 2001. 8pp.

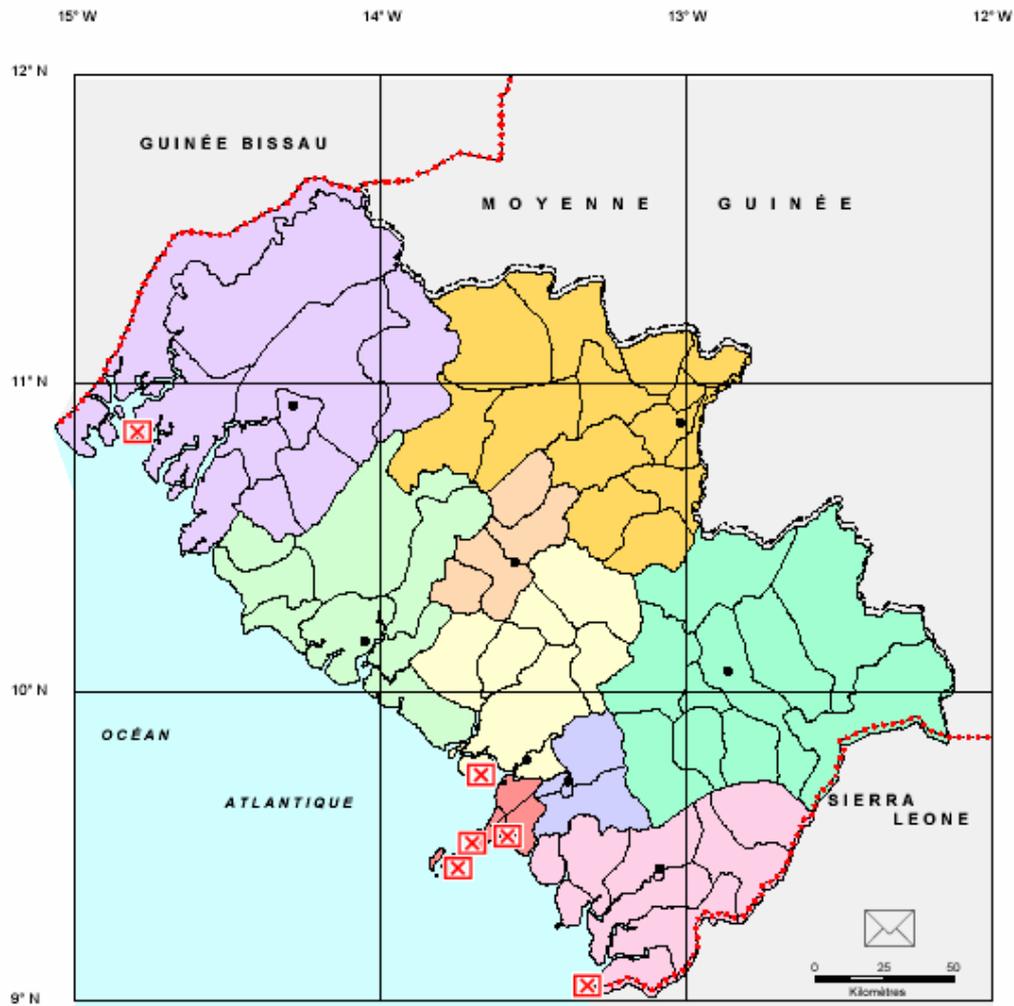


Fig. 13. The coastline of Guinea, approximately located between 09°-11°N on Africa's Atlantic coast. Sites where stranded or bycaught cetacean specimens have been examined are flagged. The area around Conakry has more records probably because reporting is better.