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A FIRST ASSESSMENT OF THE STATUS AND HUMAN IMPACTS ON CETACEAN SPECIES: TOWARDS A NATIONAL ACTION PLAN ALONG THE COAST OF CAMEROON

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Abstract: *The lack of information on certain important biodiversity species along the coast of Cameroon presents an urgent need to carry out studies to get more information on better conservation practices. The study was carried out through field surveys, interviews, literature review to present species identified and to compile species checklists, their conservation status and different threats to species. Results showed that at least eleven cetacean species (Sousa teuszii, Delphinus capensis, Tursiops truncatus, Stenella frontalis , S. coeruleoalba, S. attenuata, S. clymene, Orcinus orca, Megaptera novaeangliae, Balaenoptera musculus, physalus, and Physeter macrocephalus were identified within the coastal waters in Cameroon. In spite of the existing laws and conservation policies put in place, these species were threatened due to by-catches in gillnets and other fishing gears and the potential for increasing direct takes resulting to significant mortality rates. Aquatic bush meat consumption is also common in local communities. Other threats of varying magnitude include: habitat encroachment through coastal development, overfishing, chemical and acoustic pollution, ship collisions. The almost complete lack of scientific data on the biology, distribution, stock structure and abundance of cetaceans in Cameroon waters makes it difficult to properly assess the impact of these threats.*

Key words: Awareness Campaign, By-Catches, Cameroon, Cetaceans, Gillnets, Marine Bushmeat, Wild Meat.

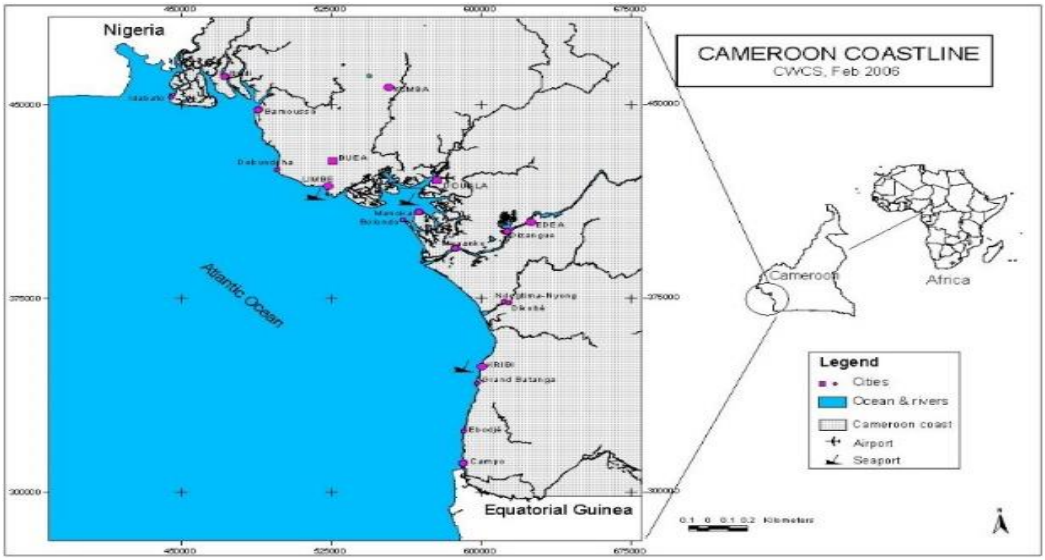
Introduction

Cameroon hosts an important marine biodiversity, cetaceans yet little is known about the importance and their status. In western Africa, the level of human impacts on cetacean's by-catch and direct take of mainly dolphins and some other cetaceans remain largely undocumented. Despite the extensive coastlines and important fisheries little is known on the interactions and the distribution of cetaceans. Survey effort in most nations is scarce or non-existent. However, it is believed that human activities could have impacts on cetacean's population and their status. In recent years, local scientists in collaboration with few international experts have started to document cetacean's observation and exploitation in Cameroon. Moore et al. (2010) implemented a rapid gillnet bycatch assessments in Cameroon, based primarily on interviews with fishermen. He found that cetacean by-catches occur in Cameroon but he did not obtain specific data on cases, species and numbers. From 2011, surveys were carried out along the Cameroon coastline with the support of certain organizations such as the Convention of Migratory Species (CMS), Columbus Zoo, Society of Marine Mammalogy (SMM), GEF Small Grants/Cameroon Programme and French organization Planète-Urgence (Ayissi et al., 2011a, 2011b, 2014a, 2014b, 2014c, 2018a, 2018b and Van Waerebeek 2017). However, these studies do not present any clear consolidation to build up baseline information on these flagship species nor carried out the evaluation of different impacts vital for long term management of species and their habitats. It is in the light of this that this study is aimed at assessing the status and human impacts on cetacean species to enable putting in place sustainable management measures of Cameroon's cetaceans.

Study Area

The coastal zone of Cameroon stretches (Figure 1) over 402 km, from the Nigerian border in the north (Akwayafe River, latitude 4°40'N) to the Equatorial Guinean border in the South (Campo River, latitude 2°20'N), falling between longitude 8°15'E and 9°30'E) (Sayer et al., 1992). The figure below presents Cameroon coastline.

Figure 01: Map of Cameroon Coastline (CWCS 2010)



The vegetation of this region belongs to the large set of massive dense humid forest of Cameroon in low and medium altitudes in the coastal forest group, consisting of dense vegetation, moist evergreen lowland to *Saccoglottis gabonensis* and *Lophira alata*, biafran subtype. This primitive forest is similar to South American affinities with the humid Amazon

rainforest (Letouzey 1968). The continental shelf of Cameroon occupies an area of about 10,600 km2 and gradually descends through 30, 50 and 100 m depths (Boye et al., 1974; Zogning 1986; Morin and Kuete 1989). The northern part has a width of about 25 nautical miles on average, while the southern portion is narrow (15 nautical miles on average). The relief shows two distinct zones separated by a parallel which passes through the mouth of the Lokoundje River. In the north, the slope is gentle, with a drop in altitude of 130 meter. This zone is rocky, with intermittent occurrence of sandbanks. Meanwhile, two major faults have been identified: a reef north of the mouth of the Sanaga River and series of outliners in the neighbourhood of Macias Nguema Island (Bioko-Equatorial Guinea). This area is favourable for trawling (industrial fishing) (Crosnier 1964). South of this parallel, the relief of the continental shelf is more disjointed with many reefs and sandbanks. The interruption of the slope occurs at 50 m depth between Campo and Kribi. This area is not suitable for trawling, but is favourable for small scale fishing. Many corals can be found at 150 m depth. According to Kramkinel and Bousquet (1987), four areas can be distinguished within the Cameroon coastal landscape: (From Campo to mouth of the River Nyong, from River Nyong to Limbe, from Limbe to Idenau and from Idenau to Nigeria border).

Data Collection

Relevant data for the study was collected from three randomly selected fishing ports (Douala, Kribi, Limbe) along the Cameroon coast. Field visits and monitors were carried out where the researcher directly observed the fish landing procedures while checking for “by-catches,” and also attempt to correlate these with main fish target species and fishing arts (e.g. set or drift gillnets, purse-seines, long-lining, traps). Photographic records and minimum postmortem data and samples were obtained (e.g. standard length, sex, lactation/pregnancy, evidence of external trauma from fisheries). Interviews were carried out with fishermen, fish mongers and other locals to gather information about cetacean captures and the seasonal or native presence/absence of near shore dwelling dolphins (either humpback or bottlenose) as well as Southern Hemisphere humpback whales during the austral winter, or other cetaceans. A beach-based and boats surveys in coastal areas was carried out where habitat appears particularly suitable for those species.

Data Analysis: Results and Discussion

Species present and their status

Results showed that eleven cetacean species were found to be common, seasonal or rare within the Cameroon coastline as shown in Table 1. The table below present those species.

According to decree 0053 MINFOF (Ministry of Forests and Faunal) of April 1, 2020 Distribution of animal species is:

Category A: Rare or endangered species, these species are therefore fully protected and must under no circumstances be slaughtered or captured except with special authorization.

Category B: Species benefiting from protection, they can only be hunted, captured or killed after obtaining a wildlife exploitation permit.

Category C: Species benefit from the general protection measures provided for by law, in compliance with international conventions to which Cameroon is a party

IUCN Status:

Data deficient (DD): Species for which more data and assessment is required before their status may be determined, not enough data to assess its risk of extinction

Endangered (EN): Species faces a high risk of extinction (in the wild) in the near future

Vulnerable (VU): High risk of extinction in the wild

Lesser concern (LC): Very Low risk; does not qualify for a higher risk category and not likely to be threatened in the near future. Widespread and abundant taxa are included in this category. The presence of cetaceans within the Cameroonian coast can be justified by numerous reasons because this area constitutes a migratory corridor for these species in the Gulf of Guinea, it constitutes a refuge and reproduction zones.

Table 01: Cetacean Species Encountered in Cameroon and their Conservation Status

Families	Common names	Genus and species	Status			
			National	CITES	IUCN	Migration
Delphinidae	Atlantic humpback dolphin	*Sousa teuszii*	Category A	Appendix I	VU	Endemic
Delphinidae	Long-beaked common dolphin	*Delphinus capensis*	Category C	Appendix II	LC	Common
Delphinidae	Common bottlenose dolphin	*Tursiops truncatus*	Category C	Appendix II	LC	Common
Delphinidae	Atlantic spotted dolphin	*Stenella frontalis*	Category C	Appendix II	LC	Common
Delphinidae	Clymene dolphin	*Stenella clymene*	Category C	Appendix II	LC	Common
Delphinidae	Pantropical spotted dolphin	*Stenella attenuata*	Category C	Appendix II	LC	Common
Delphinidae	Striped dolphin	*Stenella coeruleoalba*	Category C	Appendix II	LC	Rare
Delphinidae	Killer whale	*Orcinus orca*	Category C	Appendix II	DD	Rare
Balaenopteridae	Humpback whale	*Megaptera novaeangliae*	Category A	Appendix I	LC	Seasonal
Balaenopteridae	Blue whale	*Balaenoptera musculus*	Category A	-	EN	Seasonal
Physeteridae	Sperm whale	*Physeter macrocephalus*	Category A	Appendix I	VU	Seasonal

CITES: Convention on the International Trade in Endangered Species of Wild Fauna and Flora
IUCN: International Union for the Conservation of Nature

Human Threats:

Aquatic Bush Meat Consumption

Aquatic bush meat consumption is one of the main threats for cetaceans in Cameroon. Most of the time fresh carcasses obtained from catches and from strandings are utilized in the villages primary as food item. Dolphin meat is commonly consumed freshly cooked or smoked. No detailed data exist for the utilization of specific cetacean species. But one case of a sperm whale stranded in Kribi was widely remembered by independent sources who indicated that several people suffered acute gastro-intestinal problems after ingestion, and some were even hospitalized. As elsewhere, teeth of sperm whales are eagerly collected as ivory. The figure below present certain cases of bush meat threat.

By-Catches

No official or other statistics are available on by-catches of cetaceans, and they are not reported by the fishermen. Nigerian and Ghanaian fishermen occupy a dominant niche among many fisher communities in Cameroon, and customs transfer such as fishing and processing techniques, hunting of dolphins and diet habits, including the consumption of cetacean products, should be expected. Although interviewees frequently denied the occurrence of cetacean by-catches at first, apparently because they feared it was illegal, when the issue was revisited after reinforcing trust with the interviewer, most fishers finally admitted that cetacean by-catches occur with some regularity. Fresh carcasses obtained from such catches and from strandings are utilized in the villages, primarily as food item (marine bush meat). The figure below showing by-catches on cetaceans.

Direct Takes

Survey at Japoma and Mbongo (Littoral Region) from the 1st to 4th June 2011 revealed that, reports from locals indicated that a group of about 12 dolphins were spotted in the Dibamba River with rising tide, near Japoma (N4.0365, E 9.8196) and Mbongo (N4.4620, E8.9840) in May 2010. Dolphin sightings were suggested to be unusual in the Dibamba River. A few days later one dolphin was found stranded within mangrove roots and was killed by Nigerian fishermen. When additional dolphins became stranded, they suffered the same fate. The village chief mentioned (pers. comm. to I. Ayissi, 2 June 2011) that two dolphins were butchered in his presence and the meat was distributed among the villagers for personal consumption. The species of dolphin has not yet been identified but *T. truncatus* is considered possible. Some skeletal material that was collected awaits examination. The consumption of cetacean products initiated with the opportunistic but regular utilization of by-catches can give rise to a larger market demand and ultimately may turn commercial, leading to direct takes of mainly delphinids, especially in situations where important fish stocks are depleted following over-exploitation. The relatively low prices cited by two fishermen as typically paid per dolphin suggest the current local market for dolphins is still immature.

Over Fishing

Both humans and marine mammals act as top marine predators and inevitably compete for fish resources. The coasts of Cameroon are characterized by intense fishing activities (Folack and Njifondjou 1995; Ayissi 2008 and Moore et al., 2010). Besides nationals, thousands of fishermen from Nigeria, being long term residents, were found to operate from Cameroon, as well as smaller numbers from Togo, Benin and Ghana. A wide variety of fishing arts are practiced by the small-scale fishers, including drift and set gillnets, long-lines, purse-seine nets and beach seines. Both multifilament and monofilament nets are widely used, depending on target species and sizes. In the course of the past few years I. Ayissi (personal observations) noticed an increase of Asian trawlers (from China, Korea, Japan) off Cameroon's coast, vessels with the reputation of often unsatisfactory adherence to fisheries regulations. Between 1999 and 2009 Chinese pair-trawlers ''chalut-boeuf'' were deployed on Cameroon's continental shelf. Pair-trawling is well known for its devastating effects on benthic fauna and flora (Liggins and Kennelly 1996). Little or no recent data are published on catch statistics and the status of fish stocks in Cameroon, but circumstantial evidence suggest that these follow the general trend of fisheries in the Eastern Central Atlantic (FAO area 34), i.e. increasingly over-exploited stocks (FAO 2011).

Chemical Pollution

Only the lower 20 km of the Sanaga River are navigable, up to Edea, home to the second largest hydropower plant in the country (265 MW). The ALUCAM aluminium smelter in Edea is dependent on the Sanaga for process water and is the single biggest energy consumer in Cameroon (Van der Waarde 2007). The lower reaches of the Sanaga, including its estuary are sparsely populated.

Conclusion and recommendations

The lack of scientific data on the biology, distribution, stock structure and abundance of cetaceans in Cameroon waters makes it difficult to properly assess the impact of fisheries bycatch and direct takes (and the variousother threats), let alone address them. Evidence for the utilization of at least seven species for human consumption is available, including, Atlantic humpback dolphin, common bottlenose dolphin, striped dolphin, long-beaked common dolphin, Clymene dolphin, humpback whale and sperm whale. This agrees entirely with the combined by-catch and strandings list. Indications are that most or all specimens were used as marine bush meat.

An acceleration of research is solicited with the involvement of national Universities and Research Centres. More faunal surveys are needed to unveil the potentials of the area and the need for the establishment of important relationships between species abundance, site conditions and socio-economic activities with the view to identifying sustainable marine ecosystem utilization options. In order to achieve management of Cameroon's coastline and marine habitats with important flagship species encountered, strategies could be set up to deal with the key threats that prevent the achievement of the vision of conservation. The study recommends the development of programmes following national and international laws and policies with an action plan to achieve the following goals:

- Identify key threats facing cetaceans;
- Actions to address key threats through law enforcement, within marine protected areas;
- Develop programmes such as awareness campaigns,
- Also, it is urgent to involve all stakeholders in the country.

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