



Assessment of habitat information and management in the Ghana pole and line fishery improvement project

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Introduction

The Ghana pole and line Fishery Improvement Project (FIP) was launched in November 2018 on the Fishery Progress website. As part of the FIP action plan, the following tasks were outlined by the consultancy firm Poseidon (2018a and b) who completed the pre-assessment and action plan:

11a Evaluate available information on habitats and MPAs related to habitat protection in the fishing areas (for instance, analyse first the Ghana MPA strategy: its situation, implementation and monitoring, a 157-p. draft available in January 2018).

11b: Evaluate the likely habitat impacts of the gears used by live-bait fishers.

11c: Assess whether more information is required to assess habitat impacts of the live-bait fishery – if not, stop.

The pre-assessment clearly states that the tuna and bait fishery do not interact with benthic habitats. However, the tasks were precautionarily identified and published. The purpose of this short report is to explore the known information about Ghana's coastal habitats and its protection in areas overlapping with those of the bait fishery and ascertain whether this action is necessary for the progression of the FIP.

Current knowledge of Ghana's bait species stocks

The report commences with a summary of information of what is known about the bait species, their distribution and known fishing areas for the artisanal and industrial fleets. This report makes reference to artisanal vessels as they sometimes supply the industrial fleet by bringing their canoes to the bait boats to sell the live bait and so their activity also needs to be considered. Additionally, the artisanal catch of bait species makes up a significant portion of the fisheries taking bait species and has its own economic importance for the communities in Ghana. Certainly, this is where the wealth of literature and research lies, with very limited information available about the bait fishing activities of the tuna pole and line vessels.

According to Kortanteng (1995): "In the Ghanaian marine ecosystem, there are two sardinella species: the round sardinella (*Sardinella aurita*) and flat sardinella (*Sardinella maderensis*). These are the only sardinella species in the western Gulf of Guinea; that is, the area between Côte d'Ivoire and the Republic of Benin. These two sardinella species together with the European anchovy (*Engraulis encrasicolus*) and chub mackerel (*Scomber japonicus*) are the most important small pelagic fish species in Ghanaian waters and throughout the Western Gulf of Guinea. The round sardinella is more important than the flat sardinella in terms of total landings".

Catches of the main small pelagic fish in Ghana in 2017 were dominated by *S. aurita* and anchovy species (40 and 34 percent respectively, of the total catch). Of all the species recorded (8 total), four increased and four decreased from the 2016 levels (FAO, 2019).

Fishing areas

For anchovies, the main fishing areas identified by the GTA were the Keta area, Tema/Prampram area, Winneba/Nyanyanu area and saltpond area (Ayertey, S., personal communication). Figure 1 depicts the aforementioned locations for the reader who does not have geographical knowledge of Ghana.

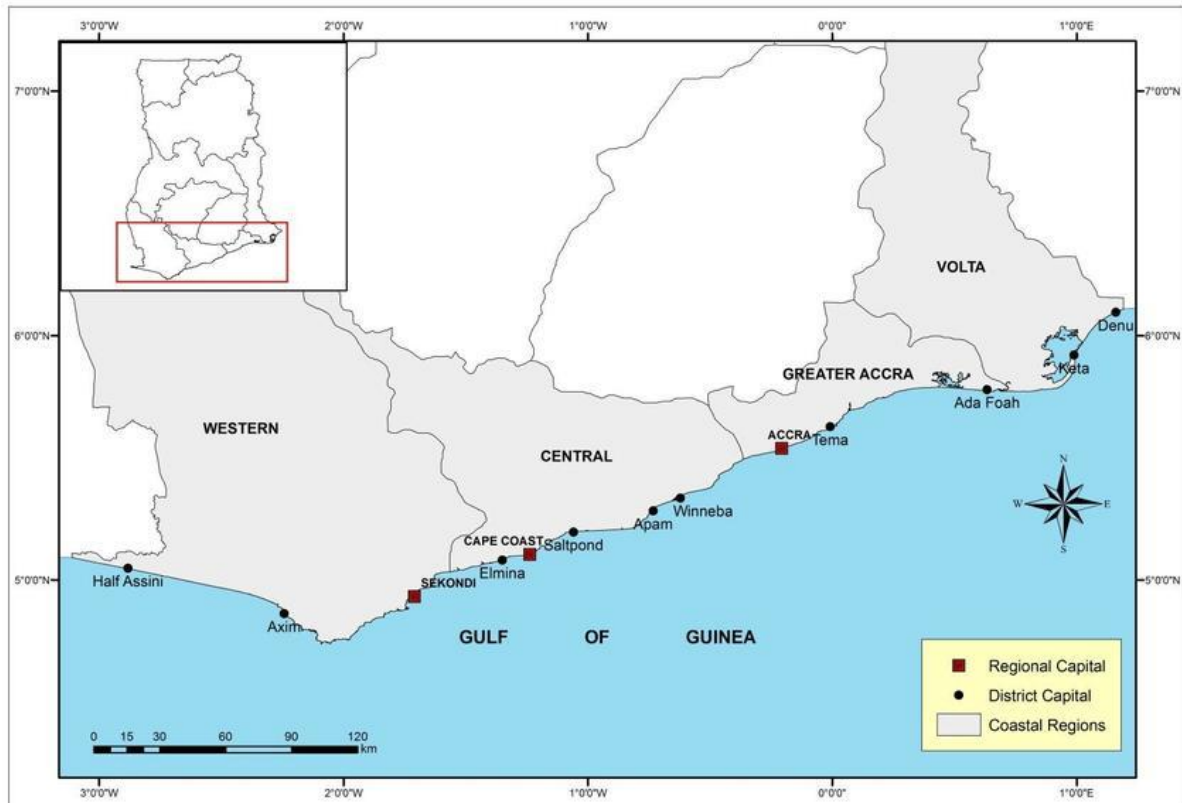


Figure 1. Map of Ghana depicting the areas mentioned as anchovy fishing grounds (source: Ameyaw, 2017).

According to FAO (2019), anchovy caught in Ghanaian belongs to the western stock (covering Benin, Côte d'Ivoire, Ghana and Togo), the two species of sardinella caught in Ghana are also from the western stocks of those species. For anchovy, catches across the region generally reduced between 1990 and 2017, with a slight increase in 2016. This is reported to mirror the same trend seen locally in Ghana. For both the western stocks of sardinella, peak catches occur between June and September. This coincides with the major upwelling event in the area. In general, catches of the round sardinella stock showed a declining trend between 2004 and 2017 (FAO, 2019).

Figure 2 and Figure 3 below provide the distributions of bait stocks locally in Ghana, as identified by the 2016 Nansen cruise report for the NORAD FAO Project (GCP/INT/003/NOR), and which were used in the 2018 MSC pre-assessment of this fishery.

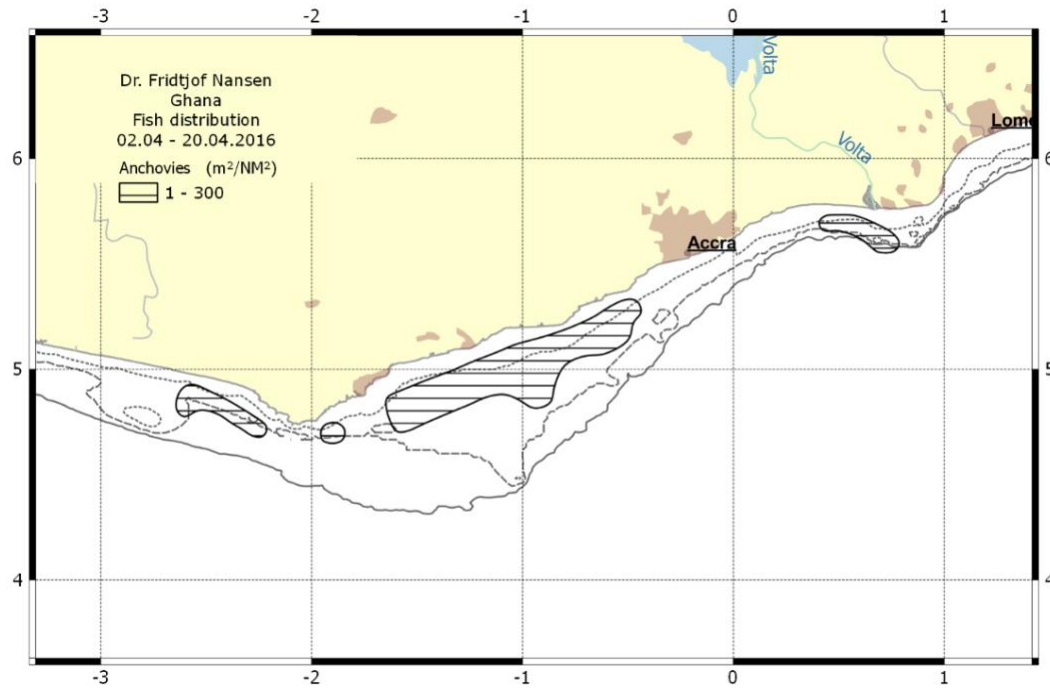


Figure 2. Distribution of anchovies in Ghanaian waters (NORAD - FAO Project (2016) in Poseidon, 2018a).

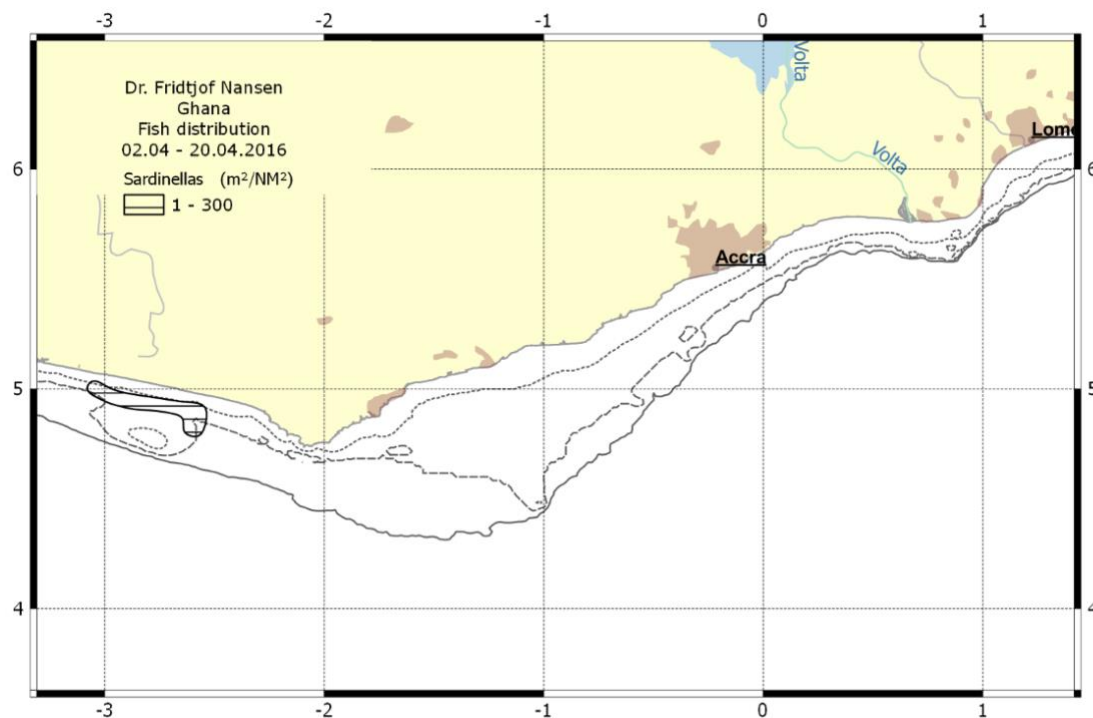


Figure 3. Distribution of sardinellas in Ghanaian waters (NORAD - FAO Project (2016) in Poseidon, 2018b).

Figure 4 provides examples of bait fishing locations utilised by the Ghana pole and line fleet in recent years. Fishing occurs close to shore which is roughly consistent with the distributions presented in Figure 2 and Figure 3.

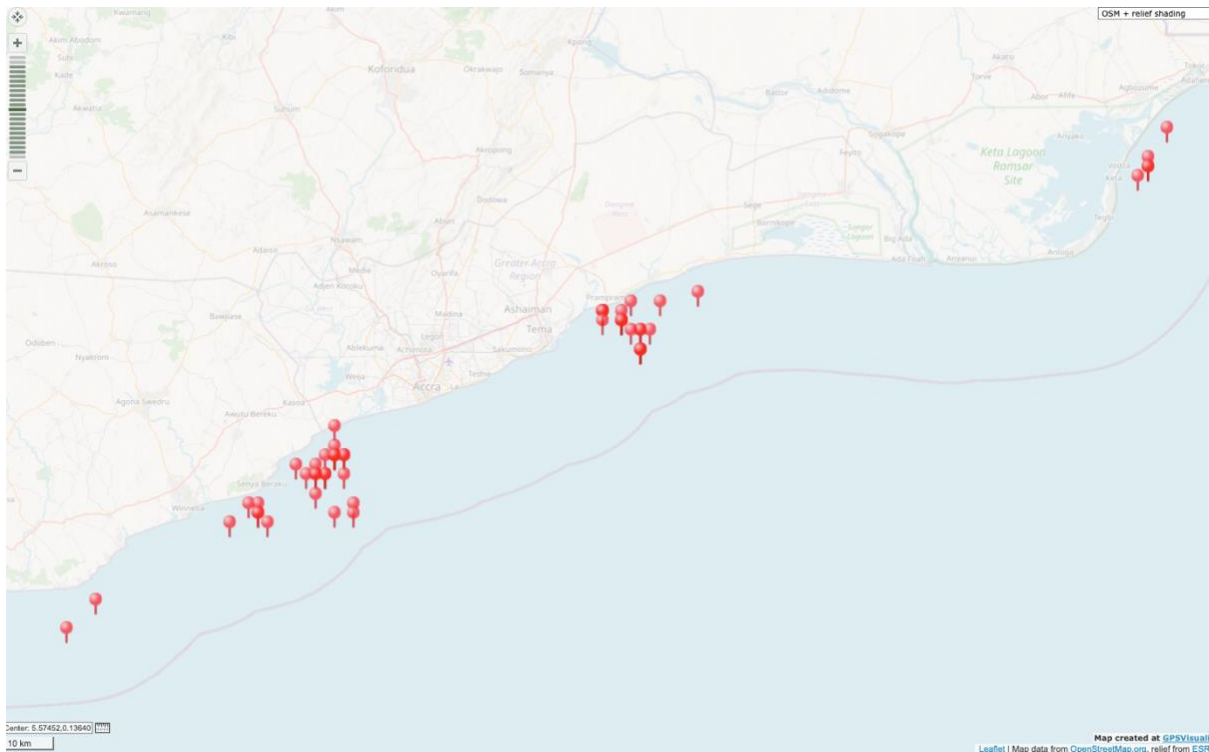


Figure 4. Bait fishing locations of a Ghana pole and line trips (source: Ghana Tuna Association logbooks).

Gear types

The ‘ali’, ‘poli’ and ‘poli-watsa’ are the main artisanal fishing nets used in the sardinella fishery in Ghana. The poli and poli-watsa nets are used when the fish are schooling and the ‘ali’ net is used when the fish are scattered, normally at the beginning or towards the end of the sardinella season. The ‘ali’ is also the main net used in catching *Sardinella maderensis* off the main sardinella seasons. Purse seine nets, similar in construction to the poli nets are used by the inshore vessels (canoes). There are over 3000 artisanal purse seine canoes in Ghana used to catch small pelagics (Lazar et al., 2018). The canoes vary between 12 and 18 metres in length and are powered by outboard motors of 40 hp (FAO, 2019).

The sizes of the meshes and twines constitute the difference between the two nets. Whereas the ‘poli’ net has ten-millimetre stretched mesh, the inshore purse seine net has 25 mm mesh made of thicker twine (Nunoo et al., 2015).

With respect to the industrial fishery bait collection, “spotters” on the pole and line vessel are used to look for bait schools. “Spotters” are trained members of the crew who also look for free-schools of tuna during fishing activities. Once a bait ball has been located, the main vessel is slowed, and the smaller bait boats are deployed. Crew go out with nets with a six-millimetre mesh size. The fish are encircled and then scooped using buckets and transferred to the bait wells on the main vessels, which are filled with seawater.

Fishing for bait may not be conducted with lights (the use of light as a method to aggregate fish is prohibited in Ghana’s waters, under Regulation 11(1) of the 2010 Fisheries Regulations, LI 1968) at night, so bait fishing must be conducted during sunlight hours. The result of this is that sometimes it is easier for the pole and line vessels to buy from the canoes, as they cannot get suitable quantities of bait during the day. The bait bought from the canoes are often very stressed due to how they are captured and do not live very long in the wells (usually around one day). This means that they have to



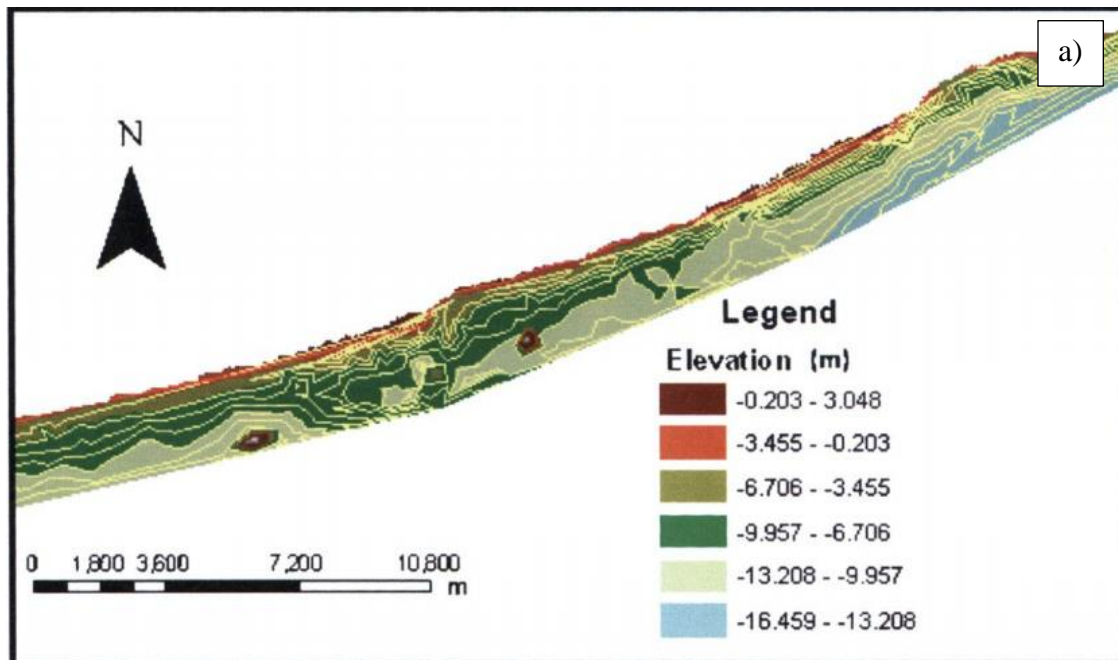
keep returning from the tuna fishing grounds to buy more bait from the canoes. When the pole and line vessels catch bait themselves, they usually last up to five days in the bait wells (S. Ayertey, GTA, pers. comms.).

Fishing pressure is driven largely by the artisanal fleet operating under open access rules using bigger and more efficient fishing gear and technologies. The average purse seine size is about 800 m³ today as opposed to 275 m³ in the 1970s. Canoes' gross tonnage and capacity increased by two and a half fold (from two to five tonnes) (Lazar et al., 2018).

Current knowledge of Ghana's coastal habitats

The Fishery Committee for the Eastern Central Atlantic (CECAF) is the Regional Fishery Body in charge of promoting sustainable utilisation of the living marine resources within its area of competence, by the proper management and development of the fisheries and fishing operations. There are no ad hoc scientific surveys for mapping sensitive areas in West Africa coordinated either by CECAF or by the Coastal States. However, important information on sensitive species and habitats has been collected in the area in deep-sea oceanographic surveys (EU, 2019).

Extensive marine habitat mapping has also not taken place in Ghana's EEZ to date, but smaller-scale analyses have been completed for the immediate vicinity to the seashore (Figure 5). This is presented to provide some evidence, granted albeit not conclusive evidence, that there are areas of the coastline where there is a relatively steep slope, reducing the changes of pelagic fishery gear used to target bait species such as sardinellas, interacting with the benthic environment.



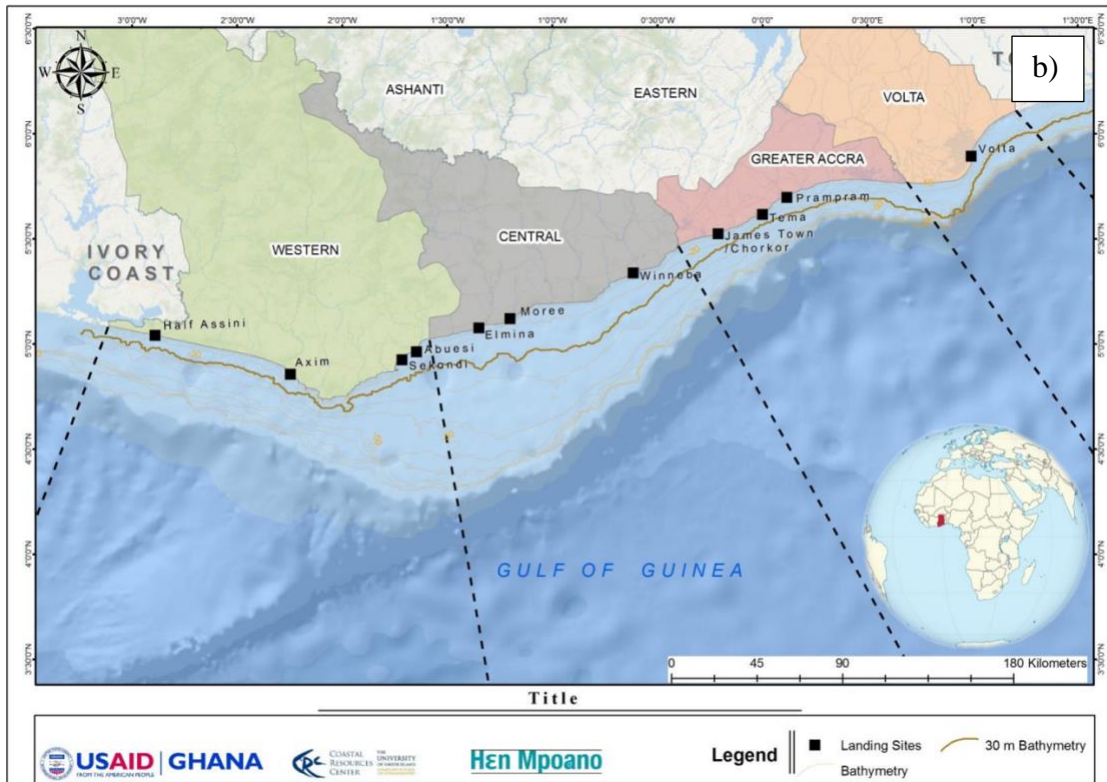


Figure 5. a) Contour map of part of the Accra shores indicating relatively steep slope (source: Addo, 2011) and b) map showing the 30 m depth profile around the coast Ghana (source: Asare et al., 2016).

In Ghana, none of the 227,500 km² Exclusive Economic Zone (EEZ) has any form of protection implemented according to the [Marine Protection Atlas](#). Additionally, no vulnerable marine habitats (VMEs) have been identified on the VME database compiled by FAO (Figure 6).

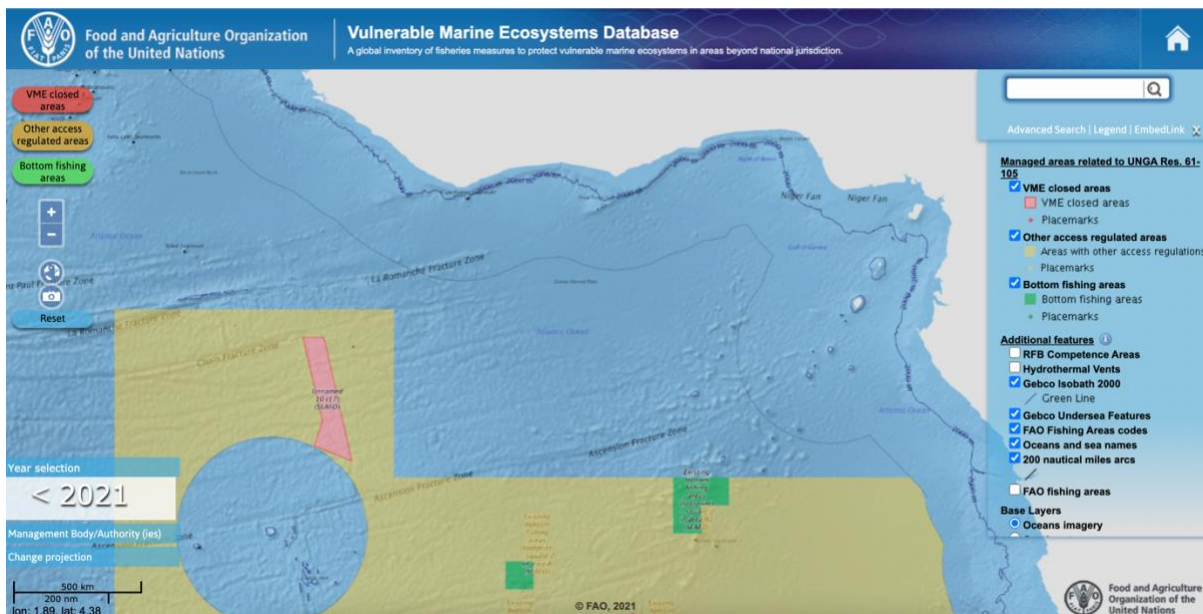


Figure 6. Screenshot from the FAO VME database (source: <http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html>)

An interview was held with the Ghana Fisheries Commission on 29th March 2021 to understand the current management, legislation and efforts and whether this is even relevant to the pole and line



fishery and its respective bait fishery. A statement from the Fisheries Commission can be found in the Appendix.

Future of coastal protection in Ghana

Although there is not currently any have any formal protection, in 2016, GRID-Arendal, a non-profit environmental organisation based in Norway launched a project in 2016 called “[Mami Wata – enhancing the marine management in werst Africa through training and application](#)”. One of the project’s main objectives of this on-going initiative is to support Integrated Ocean Management in Benin, Côte d’Ivoire, and Ghana. As of [April 2021](#), the Environmental Protection Agency in Ghana is leading the “Ecosystem Based Approach to an Integrated Marine and Coastal Environment Management in Ghana” project in the western Region of the country, with a coastline of approximately 200 km. Further to this, a transboundary cooperation between Côte d'Ivoire and Ghana is aiming to protect a shared stock of economically significant sardinella, and address pollution of the shared Aby Lagoon. At the time of writing this report, it was unclear as to the status of the sardinella work.

Conclusion

From the literature review and interviews with the Ghana Tuna Association and the Ghana Fisheries Commission it is evident that the bait fishery is vital to not only the commercial fishery but the local communities of Ghana. There is no specific management in place presently with respect to marine protected areas in Ghana or other forms of management such area management. There are other projects planned which may aid the bait and overall pole and line fishery also. For example, the [Global Monitoring for Environmental ad Security \(GMES\) Africa](#) initiative, a partnership between African Union and the European Union. The Regional Marine Centre (University of Ghana) is implementing the Marine and Coastal Areas Management component of the project in western Africa. The Centre provides Earth Observation (EO) services to 12 countries namely Benin, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Senegal, Sierra Leone and Togo. The operational services being carried out are: 1) mapping potential fishing zones (PFZ) and monitoring fishing vessel traffic; 2) monitoring and forecasting oceanography variable; 3) forecast of ocean conditions disseminated as SMS, USSD and an app; 4) monitoring coastal vulnerability; and 5) coastal ecosystem/habitat mapping. The general objective of the Marine and Coastal Areas Management in Western Africa Action is to provide decision-makers with EO information and tools that would support effective marine and coastal resources management in western Africa. No further information is available currently about this project.

As mentioned in the 2018 pre-assessment bait fishing gear does not come into contact with the benthic environment, and no VMEs have been identified in the waters of the coast of the country. This indicates that legal protection or management of the seabed is not key to the sustainability and proliferation of the Ghana bait fishery. It does however raise the question of what more can be actioned with regard to conservation and protection of the bait fisheries by the countries, including Ghana, which share these bait stocks?



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Appendix

In case of reply the number and date of this letter should be quoted

Tel: +233 302 675 155
Fax: +233 302 675 146
My Ref. No: FD/PAO/13/V.23/117
Your Ref. No:

FISHERIES COMMISSION
P. O. BOX GP 630
ACCRA - GHANA


REPUBLIC OF GHANA

14th June 2021

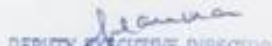
Statement of Intent for the Ghana tuna pole and line tuna FIP (Thai Union)

This statement is in relation to the bait fishery and respective marine habitats in which the fishery resides. At present, extensive marine habitat mapping has also not taken place in Ghana's EEZ, but no Vulnerable Marine Habitats (VMEs) have been identified by Food and Agriculture Organization (FAO).

With respect to the Bait fisheries management within coastal and marine habitats in Ghana, there are no identifiable Marine Protected Areas restricting the use of fishing gears and any other activities in our waters overlapping the fisheries.

Further to this, the Ghana Fisheries Commission confirms that there is no trawling nor gear interactions within the benthic environment when targeting bait species, that is, neither the artisanal nor the commercial fishing vessels' fishing gear interacts with the benthic environment when targeting bait species for either subsistence, domestic sale or as bait for the tuna pole and line fishery.

Fishing for bait is done by surface gear, that is, purse seine and hence do not reduce the structure and function of the commonly encountered habitats. This infers that further specific management of habitats in the bait fishing grounds is not necessary.


DEPUTY EXECUTIVE DIRECTOR
FISHERIES COMMISSION
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ACCRA
PAUL BANERJEE
14/6/21