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**Research plan for the 2023 COMHAFAT cetacean sighting survey in the coastal waters of western North Africa**

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# Research plan for the 2023 COMHAFAT cetacean sighting survey in the coastal waters of western North Africa

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## ABSTRACT

A plan is proposed for a cetacean sighting survey conducted by COMHAFAT in coastal waters of western North Africa in 2023. The study area is set in the coastal waters from Liberia to Ghana through Cote d'Ivoire. Zigzag track lines with around 1,200 nm of length are placed in the area, except for shallow waters less than 50 m for safe sailing. A 21-days survey period will be set in winter of 2023 season. Of the period, the survey will be conducted for 15 days. The remaining 6 days is set for transit cruise, i.e., 2 days is from Guinea to Liberia and 4 days is from Ghana to Guinea. The survey is started off Liberia and finished off Ghana. The research vessel, GENERAL LANSANA CONTE of Guinea (198 tons), will be engaged. Researchers from COMHAFAT member states conduct the survey. Scientists from nonmember states, however, can be onboard, if the COMHAFAT and vessel capacity allow it. Cetacean searching is conducted from line transect method, under good weather condition (Beaufort wind scale of 3 or less and greater than 2 nm in visibility). Researchers search the sea surface for cetaceans from the vessel following the pre-determined track lines at around 10 knots. The normal closing mode survey is carried out, in which closing is made for all cetacean species encountered during searching.

## INTRODUCTION

COMHAFAT (Convention Régionale sur la Coopération Halieutique entre les Etats Africains Riverains de l'Océan Atlantique)(in English, ATLAFCO: the Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic Ocean) was founded in 1989, as an intergovernmental organization of 22 countries from Morocco to Namibia.

The Constituent Convention of COMHAFAT, which is "the Regional Convention on Fisheries Cooperation among African States bordering the Atlantic Ocean", adopted on July 5, 1991, in Dakar- Senegal, fixed areas and modalities of the Regional Fisheries Cooperation among member states. The Protocol relating to the institutional framework of COMHAFAT was adopted on October 19, 1999, in Conakry – Guinea.

The headquarters of the Organization is based in Rabat – Morocco since October 24, 2009. The Executive Secretariat is responsible for boosting the activities of the Organization in carrying out all administrative, organizational and co-ordination tasks assigned to it by the Conference of Ministers and the Bureau which are the policy and decision-making body and the coordinating and monitoring body respectively. The main objective of COMHAFAT is an effective and active co-operation between member states for conservation and sustainable development of fisheries in the region.

Therefore, the Conference encourages:

1. The promoting co-operation in management and development of fisheries;
2. The development, co-ordination and harmonization of efforts and capacities of member states to maintain, operate, develop and commercialize the fishery resources;
3. The strengthening of solidarity with African States landlocked and geographically disadvantaged States in the region.

Operations are including:

1. The strengthening of maritime technical and professional training;
2. The development of fisheries research and marine sciences;
3. The promotion of trade and development of fishery products;

#### 4. The implementation of laws regulating responsible fishing.

Regarding to the development of marine scientific research, COMHAFAT encourages member states to exchange their experiences in scientific research and promotes co-ordination between their institutions and the sharing of scientific data on fish stocks. In this respect, COMHAFAT started cetacean sighting surveys in maritime waters of member states, to obtain scientific information on cetaceans.

The Cetaceans are high migrating species. They play a significant role in the balance of the marine ecosystem where they represent the top predators and the most important species within the marine ecosystem. Thus, their information is very important for fisheries resources management.

In the western North Africa, the COMHAFAT zone, the studies on cetaceans are relatively recent. In Guinea the research on the cetacean is conducted by the Centre National des Sciences Halieutiques de Boussoura (CNSHB) that has developed a research program on the survey for the African continent. Thus, cetacean sighting surveys were initiated and carried out by the CNSHB in collaboration with the bordering African countries of the Atlantic since 2002. The CNSHB organized and executed the surveys with the collaboration of some African institutions of fisheries and fisheries research centers such as the Direction General des Pêches in Gabon, the CRO of Abidjan in Côte d'Ivoire, the IMROP of Nouadhibou in Mauritania, the CRODT of Dakar in Senegal, the Direction des Pêches of Cotonou in Benin, the MFRD of Tema in Ghana, the SSRHO IRAD of Limbe in Cameroon and the CIPA of Bissau in Guinea Bissau.

The COMAHAT founded the first cetacean sighting survey in Gabonese waters in 2011 and the second one in the gulf of Guinea covering the EEZ of Côte d'Ivoire, Ghana, Togo and Benin in 2013. The results were reported by Diallo et al. (2013). COMHAFAT will continue cetacean sighting surveys in waters of member states, where scientific information on cetaceans are relatively insufficient. Here, I present a plan of the third cetacean sighting survey by COMHAFAT in the western North Africa in winter of 2023.

## **RESEARCH PLAN**

### **Research vessel**

The research vessel, GENERAL LANSANA CONTE of Guinea (198 tons), will be engaged (Fig. 1). The vessel has 29.9m in length and the upper deck elevated 5.4m above the sea surface.

### **Researchers on board**

Researchers from COMHAFAT member states conduct the survey. Samba Tenin Diallo, with much experience of participating in the past survey cruises conducted in the western Africa, will serve as the cruise leader. Scientists from nonmember states, however, can be onboard, if COMHAFAT and vessel capacity allow it.

### **Schedule**

A 21-days survey period will be set in winter of 2023 season. Detailed schedule will be decided after discussion by COMHAFAT, cruise leader, and relevant persons. Tentative schedule is noted below.

1 <sup>st</sup> Day	Participants embark. The research vessel leaves Conakry of Guinea.
2 <sup>nd</sup> Day	The research vessel arrives at the start point set off Liberia.
3 <sup>rd</sup> Day	The survey is commenced.
17 <sup>th</sup> Day	The research vessel arrives at the end point set off Ghana. The survey is finished.
21 <sup>st</sup> Day	The research vessel arrives at Conakry, after 4 days transit cruise from Ghana to Guinea. Participants disembark.

At Conakry, pre- and post- survey meetings will be held.

### **Research area and track line**

The research area is set in coastal waters of western North Africa from Liberia to Ghana (Fig. 2). In the survey area, six survey blocks are set (Fig. 3 and Table 1). Cruise track design was undertaken using 'Distance program (ver. 6.2)'. The randomly selected start point in each of the survey blocks is followed by zigzag track line (Fig. 4 and table 2). The lines are placed in the area, except for shallow waters less than 50 m for safe sailing. Length of track line in each block is based on relative size of each block. Total length of

the lines is around 1,200 nautical miles.

### **Sighting activity**

The survey is conducted in accordance with the line transect method. The normal closing mode survey is carried out, in which closing is made for all cetacean species encountered during searching. Searching is conducted, following the procedure and protocol used in the IWC/IDCR and SOWER cruises (Matsuoka et al. 2003) and in COMHAFAT 2011 and 2013 surveys (Diallo et al. 2013).

The daily survey is commenced at 08:00, if weather condition is good for cetacean searching: Beaufort wind scale of 3 or less and greater than 2 nm in visibility. The daily survey is ended at 18:00, after 10 hours searching and then the vessel drifts, anchors, or steams to next point. If weather condition is bad, the vessel will drift for wait for good weather, or steam under no searching when schedule is tight. Researchers search the sea surface for cetaceans at the upper deck of the vessel following the pre-determined track lines at around 10 knots. Searching activity is carried out with naked eyes. Scaled binoculars (7X) are used for species identification and school size counting. Photographs of cetaceans encountered will be taken for species identification and school size counting.

Angles to the sightings are measured from angle boards set in front of researchers. Furthermore, to calibrate the distance and angle measurement to sightings, distance and angle measurement experiments will be conducted during the survey, where distance and angle to the objects encountered during the survey (e.g., ships and buoys, etc.) is measured on the radar screen and then they are compared with estimates by researchers to correct measurement error.

### **DATA ENTRY, MANAGEMENT, AND ANALYSIS**

Sighting and effort-weather data will be recorded on the sighting and effort-weather data form, respectively (Fig. 5). All data and samples including photographs collected during the survey belong to the COMHAFAT. Survey results will be submitted to the IWC/SC, after agreement of participating countries and the COMHAFAT.

### **REFERENCES**

- Diallo, S. T. and Bamy, I. L. 2013. Report of the cetacean sighting surveys in the COMHAFAT zone: coastal zone of Gabon in September 2011, Gulf of Guinea (Ivory Coast, Ghana, Togo, and Benin) in March-April 2013. Paper SC/65a/IA13 submitted to IWC Scientific Committee. May 2013, (unpublished). 31pp.
- Matsuoka, K., Ensor, P., Hakamada, T., Shimada, H., Nishiwaki, S., Kasamatsu, F. and Kato, H. 2003. Overview of minke whale sightings surveys conducted on IWC/IDCR and SOWER Antarctic cruises from 1978/79 to 2000/01. *Journal of Cetacean Research and Management* 5:173–201.



Figure 1. The research vessel “GENERAL LANSANA CONTE” used for the COMHAFAT cetacean sighting survey planned in coastal waters of the western North Africa, winter 2023.

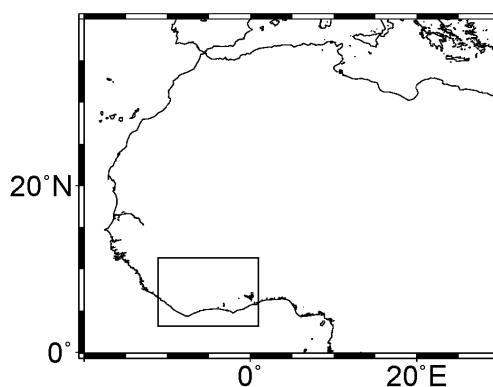


Figure 2. Study area set in coastal waters of western North Africa from Liberia to Ghana, for the COMHAFAT cetacean sighting survey planned in winter 2023.

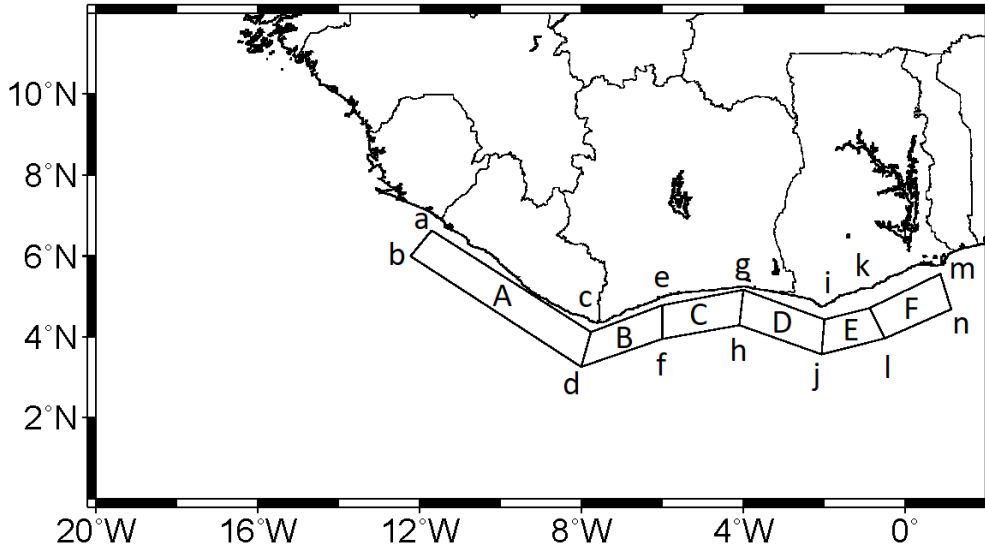


Figure 3. Six survey blocks (A-F) set in coastal waters of western North Africa from Liberia to Ghana, for the COMHAFAT cetacean sighting survey planned in winter 2023. Coordinates of survey blocks are shown in Table 1.

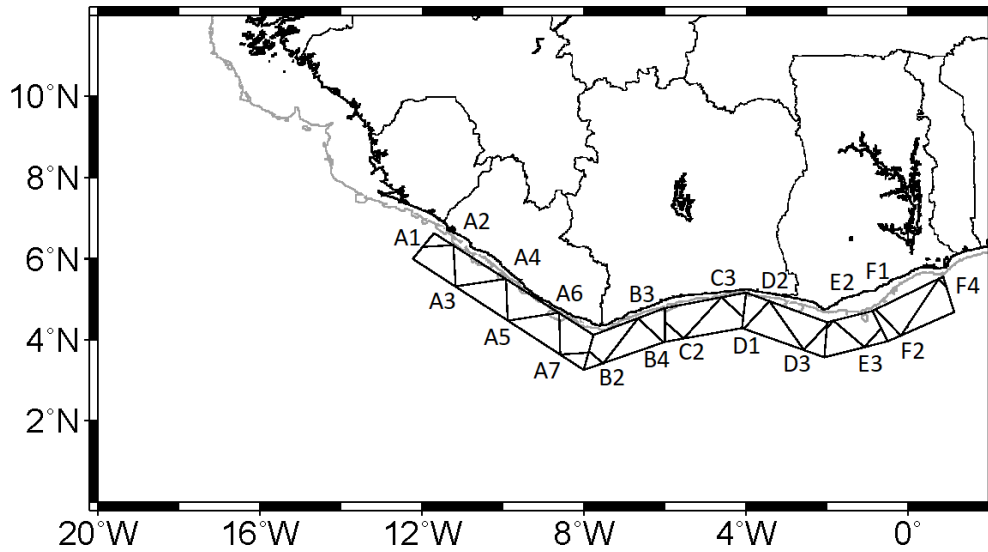


Figure 4. Predetermined track lines with around 1,200 nm of length set in coastal waters of western North Africa from Liberia to Ghana, for the COMHAFAT cetacean sighting survey planned in winter 2023. Isobaths of 50m is also shown. Coordinates of waypoints are shown in Table 2.



Table 2. Coordinates of waypoints of predetermined track lines set in coastal waters of western North Africa from Liberia to Ghana, for the COMHAFAT cetacean sighting survey planned in winter 2023.

Block	Waypoint	Lat d	Lat m	Long d	Long m	Distance (nm)
A	A1	6	17.44 N	11	58.94 W	45.4
	A2	6	19.78 N	11	13.63 W	60.8
	A3	5	19.1 N	11	10.39 W	76.0
	A4	5	29.94 N	9	55.35 W	61.4
	A5	4	28.62 N	9	52.76 W	76.8
	A6	4	40.11 N	8	37.07 W	62.0
	A7	3	38.14 N	8	35.12 W	42.4
	A8	3	41.23 N	7	53.06 W	
B	B1	3	43.92 N	7	52.34 W	27.9
	B2	3	25.07 N	7	31.88 W	84.9
	B3	4	32.14 N	6	39.98 W	52.3
	B4	3	56.29 N	6	2.04 W	
C	C1	4	26.34 N	6	0 W	36.9
	C2	4	1.8 N	5	32.54 W	83.5
	C3	5	3.08 N	4	36.09 W	43.8
	C4	4	33.65 N	4	3.77 W	
D	D1	4	16.31 N	4	3.55 W	56.1
	D2	4	57.31 N	3	25.39 W	88.6
	D3	3	44.85 N	2	34.67 W	50.1
	D4	4	21.27 N	2	0.36 W	
E	E1	4	17.29 N	2	0.67 W	15.0
	E2	4	28.35 N	1	50.64 W	60.7
	E3	3	49.12 N	1	4.48 W	37.7
	E4	4	16.98 N	0	39.2 W	
F	F1	4	45.06 N	0	48.25 W	54.1
	F2	4	6.39 N	0	10.49 W	91.0
	F3	5	30.45 N	0	45.2 E	
	F4	5	17.49 N	0	57.33 E	
Total						1225.2