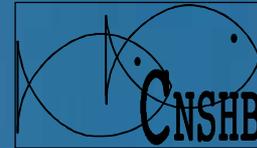


# REPUBLIQUE DE GUINEE

*Travail – Justice – Solidarité*



République de Guinée  
Ministère de la Pêche et de l'Aquaculture  
Centre National des Sciences Halieutiques de Boussoura (CNSHB)

## 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

By

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**Abstract**

The cetacean sighting survey in Gabon coastal waters took place in September 04 to 10, 2011 and in the gulf of Guinea (Côte d'Ivoire, Ghana, Togo and Benin), from March 23rd to April 06th, 2013. Both were carried out with N/O GENERAL LANSANA CONTE. They were carried out by the Centre National des Sciences Halieutiques of Boussoura (CNSHB) under the auspices of COMHAFAT, with the collaboration of some African fisherie institutions 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. During the first survey in Gabon, 232.1 nautical miles (mn) of transects lines were covered. 465 cetaceans species, were sighted. In terms of schools and individuals, there were 30 schools of 191 animals of humpback whale, 1 school of 2 animals of Bryde's whale, 1 school of 150 animals of Pantropical spotted dolphin, 1 school of 40 animals of Atlantic spotted dolphin, 1 school of 25 animals of Bottlenose dolphin, 8 schools of 15 unidentified whales, 4 schools of 25 unidentified dolphins, 2 schools of 2 animals of Sperm whale and 1 school of 6 animals of Sei whale. During the second survey, 1004.14 nautical miles (mn) of transect lines were covered. 34 schools for a total of 2498 cetacean species were sighted. In terms of schools and animals sighted, there were 1 school of 15 animals of Bottlenose dolphin, 1 school of 10 animals of Rough-toothed dolphin, 1 school of 1 animal of Bride's whale, 7 schools of 279 animals of Shortfinned pilot whale, 2 schools of 122 animals of Risso's dolphin, 5 schools of 160 animals of Pantropical spotted dolphin, 5 schools of 692 animals of Atlantic spotted dolphin, 5 schools of 27 animals of unidentified dolphins, 4 schools of 540 animals of Pygmy Killer whale, 6 schools of 652 animals of Common dolphin.

## **INTRODUCTION**

The Cetaceans are 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.

From the biological point of view, according to Jefferson T. and al., (1993), the Cetaceans are marine mammals whales, dolphins and porpoises. They belong to the order of the Cetacean according to phylogenetic classification.

This order is divided into two sub-orders the mysticety or whales with baleen whose size varies from 5 m (Pygmy whale) to 33 m (blue whale) and odontocety or Cetacean with teeth whose size varies from 1.5 m (common porpoises) to 18 m for the large sperm whale.

In the East Atlantic, the COMHAFAT zone, the studies on cetaceans are relatively recent.

In Guinea the research on the Cetacean is conducted by the CNSHB that has developed a research program on the Cetacean sighting 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.

From that time, cetacean sighting surveys are organized almost every year, to estimate the abundances and study the distribution of the cetacean species.

The Centre National des Sciences Halieutiques de Boussoura (CNSHB) organized and executed these two 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. These studies on cetacean are very important for African countries. They give a status of the cetacean resources in Africa.

The COMHAFAT funded in 2011 the 6th Cetacean sighting survey in coastal waters of Gabon and in 2013, the 7th Cetacean sighting survey in the gulf of Guinea the coastal waters of Côte d'Ivoire, Ghana, Togo and Benin.

## **OBJECTIVES OF THE SURVEYS**

The main objective of these surveys is to obtain information on the abundance and the distribution of the cetaceans in coastal waters of the COMHAFAT countries.

In the other hand the specific objectives are:

- To train the African researchers on the methods of evaluation of cetacean resources;
- To obtain information on the abundance and the distribution of the cetaceans which are the top predators in the marine ecosystem in the coastal waters of the COMHAFAT countries;
- To observe the behavior of the schools and record if possible the sounds emitted by the cetaceans;
- To collect data on marine environment and on the sighting activities, used for cetacean resources assessment
- To take photographs and films of the species, for their identification.

## MATERIAL AND METHOD

The N/O GENERAL LANSANA CONTE research vessel from Guinea was used for the surveys. The vessel has 29.93 m in length, 3.25 m draught, 1400 CV horse-power, 198 tons GRT, and 19 people cruise members and scientists.

Other material is used such as:

- Binoculars: CANON ® 8 X 32 XP with 7.5° and NIKON ® 7 X 50 with 7.3°;
- Identification Keys for cetaceans of Carwardine (1995) and Jefferson et al., (1993);
- Classical and digital cameras;
- Video camera;
- Reporters allowing reading the angles of sightings;
- Action and weather forms.

## SURVEY DESIGN AND METHODOLOGY.

The surveys were carried out in accordance with the *line transect method* (Burnham *et al.* 1980) that is authorized by the Scientific Committee of the IWC. The search for cetaceans was carried out by following the procedure and protocol used in the IWC/SOWER cruise.

The surveys were conducted on days with good weather conditions (Beaufort wind scale of 4 or less and greater than 2 nautical miles in visibility). The daily survey was commenced at 30 minutes after sunrise (around 08:00). When the weather condition is bad, the survey is not started. The research vessel drifted or anchored and waits for good weather, or sails under no searching effort. If the condition turned to be good, the survey is started. When the condition deteriorated, the vessel stopped. The daily survey is ended at 30 minutes before sunset (around 18:00) and then the vessel drifted or anchored. Next morning, if the weather condition is good, the vessel resumed the survey from the position where it ended the survey in the preceding day.

During the surveys, the research vessel followed the predetermined track lines at 8 to 10 knots. Scientists searched the sea surface for cetaceans from the upper deck of the vessel (height of around 6 m from the sea surface). The search was conducted with naked eyes. Binoculars were also used to identify species and to count the number of animals in a school. When cetaceans were detected, the vessel approached to animals in order to identify species, count school size, observe surface behavior, and take photographs for identification of species or individual.

### Cetacean sighting survey in Gabon coastal waters

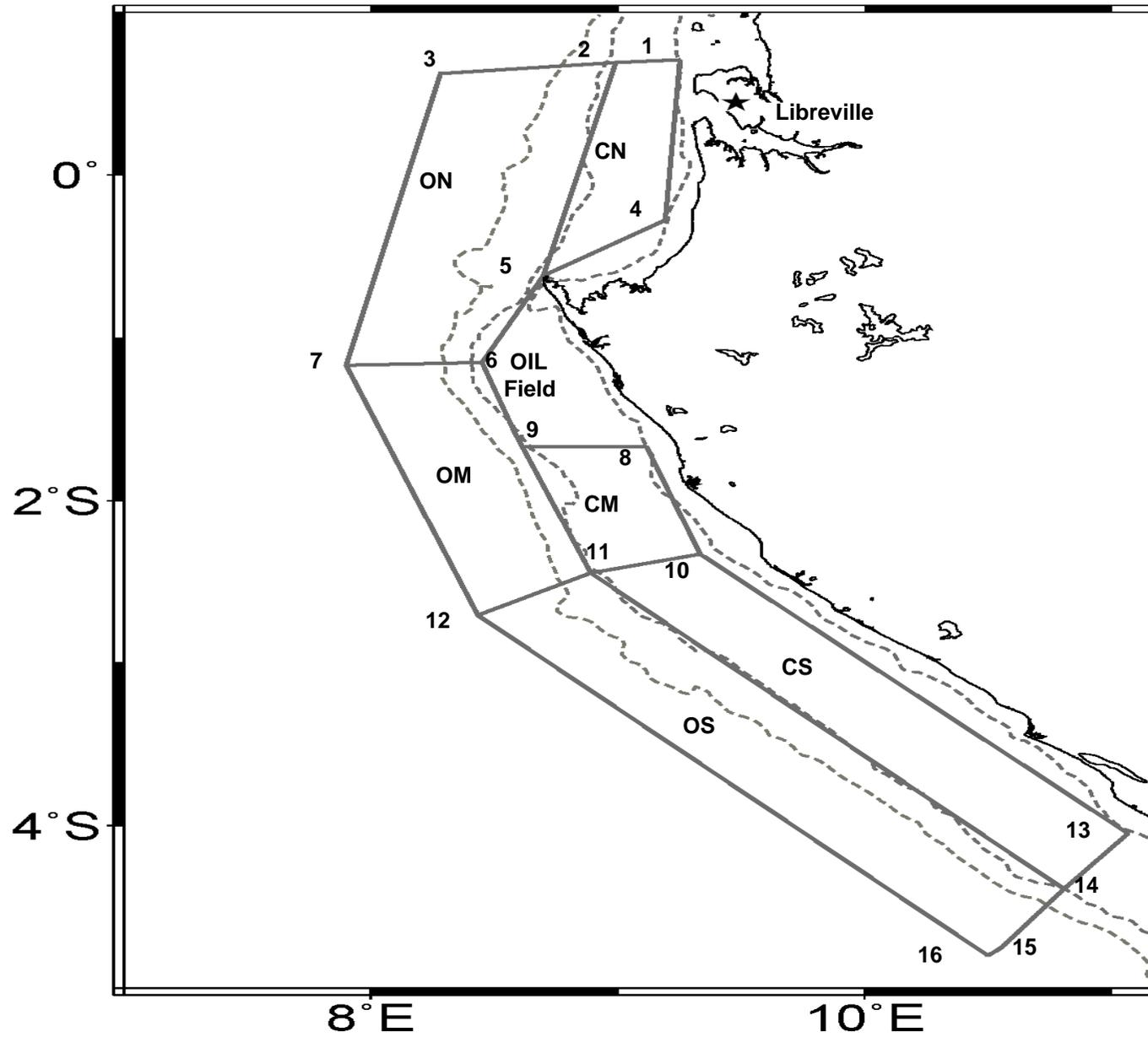
The present survey is conducted to obtain information on distribution and density of cetaceans, inhabiting Gabonese waters, the member state of the COMHAFAT.

Before the survey, the research vessel, N/O GLC, was brought from Conakry to Libreville. The vessel arrived at Libreville on the night of 02 September 2011. In the next day afternoon, all scientists were on board and then the vessel left Libreville to the starting point and started the survey on the 4<sup>th</sup> September 2011.

The study area is set in Gabonese EEZ (Fig. 1). In the cetacean sighting surveys conducted in Northwestern Africa from 2002-2008, many sightings were recorded at waters along isobaths of 200 m and 1,000 m. Thus, the study area included the isobaths. Shallow waters and oil fields are excluded from the area, for safe sailing. In the area, six survey blocks are placed

(Fig. 1). Three are offshore blocks (ON, OM, OS) and others are coastal (CN, CM, CS). Offshore blocks were primarily searched, because more cetacean species would be encountered. In the blocks, zigzag track lines with 878.0 nm of length are set (Fig. 2). The research vessel, GENERAL LANSANA CONTE of Guinea (198 tons), follows the lines at 8 to 10 knots. Guinean researchers conduct the survey, A researcher from each of the 7 African countries (Mauritania, Senegal, Ghana, Benin, Togo, Gabon and Cameroon) participated in the survey.

A 10-days survey period was set in September. In this time, it is dry season in winter. Rain is scarce and wind is not so strong. Many large cetacean species migrate between the warm tropical and temperate waters and higher latitudinal waters seasonally and they are distributed in the warm waters in winter. Thus, this season is thought to be suitable for cetacean sighting survey in the waters off Gabon.



### RESEARCHG AREA

Figure:1 Survey blocks set for the 2011 cetacean sighting survey conducted by COMHAFAT. Shallow waters less than 50 m are excluded from the blocks, for safe cruising.

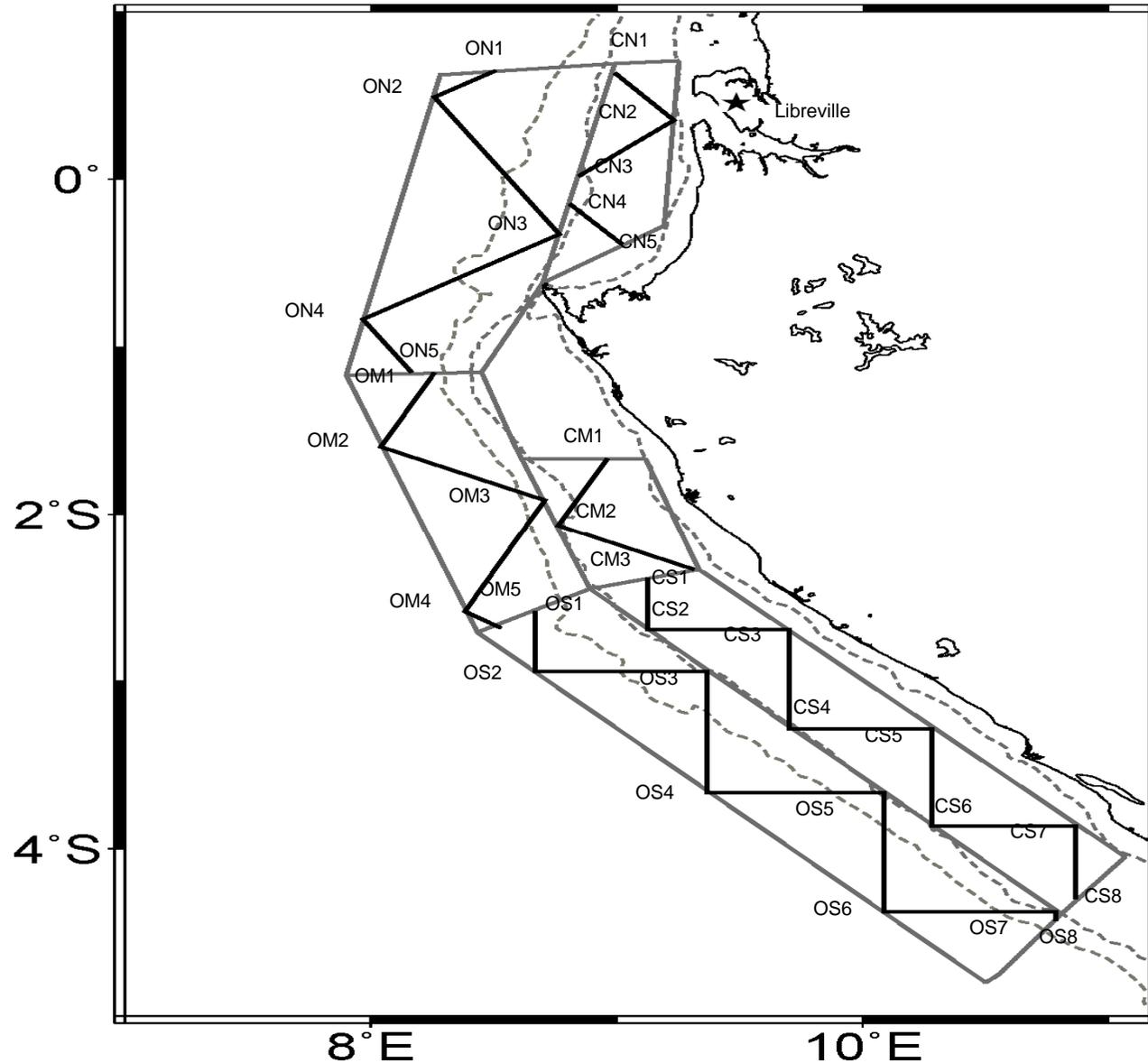


Fig 2: Survey track lines with around 1200 nm of length set in the survey blocks

Table 1. Coordinates of survey blocks set for the 2011 cetacean sighting survey in COMHAFAT zone.

Point No.	Lat.	Long
1	42.5 N	915.1 E
2	41.5 N	859.5 E
3	37.5 N	817.0 E
4	16.5 S	911.5 E
5	37.0 S	842.0 E
6	109.0 S	827.0 E
7	110.0 S	754.0 E
8	140.0 S	907.0 E
9	140.0 S	836.5 E
10	220.0 S	920.0 E
11	227.0 S	853.5 E
12	242.5 S	826.0 E
13	403.0 S	1104.0 E
14	423.5 S	1048.5 E
15	445.1 S	1033.2 E
16	448.0 S	1030.0 E

Table 2. Coordinates of track lines set in the survey blocks.

Turning points	Lat.	Long	Distance (nm)
ON 1	39.0 N	830.5 E	17.8
ON 2	29.5 N	815.5 E	57.8
ON 3	19.5 S	846.0 E	57.1
ON 4	50.0 S	758.0 E	22.5
ON 5	109.0 S	810.0 E	
OM 1	109.2 S	815.5 E	29.6
OM 2	135.7 S	802.5 E	44.6
OM 3	155.0 S	842.5 E	44.6
OM 4	235.0 S	823.0 E	10.6
OM 5	241.0 S	831.7 E	
OS 1	235.0 S	840.0 E	21.5
OS 2	256.5 S	840.0 E	41.9
OS 3	256.5 S	922.0 E	43.5
OS 4	340.0 S	922.0 E	42.9
OS 5	340.0 S	1005.0 E	42.5
OS 6	422.5 S	1005.0 E	41.9
OS 7	422.5 S	1047.0 E	3.5
OS 8	426.0 S	1047.0 E	
CN 1	38.2 N	859.5 E	22.4
CN 2	21.2 N	914.0 E	30.8
CN 3	1.2 N	850.8 E	
CN 4	8.8 S	848.5 E	19.3
CN 5	23.2 S	901.2 E	
CM 1	140.0 S	857.7 E	26.9
CM 2	204.0 S	845.6 E	37.0
CM 3	220.0 S	918.8 E	
CS 1	223.0 S	907.5 E	18.5
CS 2	241.5 S	907.5 E	34.5
CS 3	241.5 S	942.0 E	35.5
CS 4	317.0 S	942.0 E	34.9
CS 5	317.0 S	1017.0 E	35.0
CS 6	352.0 S	1017.0 E	34.9
CS 7	352.0 S	1052.0 E	26.0
CS 8	418.0 S	1052.0 E	
Total			878.0

### Cetacean sighting survey in the gulf of Guinea

The study area is set in coastal waters of Ivory Coast, Ghana, Togo, and Benin (Fig. 3). As the preceding survey, the study area includes the isobaths. Shallow waters less than 50 m and oil fields are excluded from the study area, for safe sailing. In the area, zigzag track lines with around 1200 nm of length are placed (Fig. 4). In the area, 7 survey blocks are placed from A, B, C, D, E, F to G (Fig. 5). The starting point of the lines is set off Abidjan, Ivory Coast and the survey is finished when the vessel arrived at the end of the lines set off Cotonou, in Benin. The research vessel, GENERAL LANSANA CONTE of Guinea (198 tons) follows the lines at 8 to 10 knots. African researchers conduct the survey.

Figure:3 Study area in coastal waters from Ivory Coast to Benin, where the 2013 cetacean sighting survey is conducted by COMHAFAT.

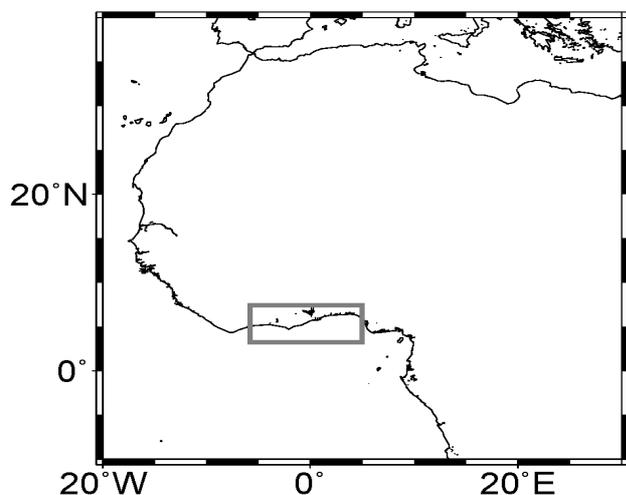
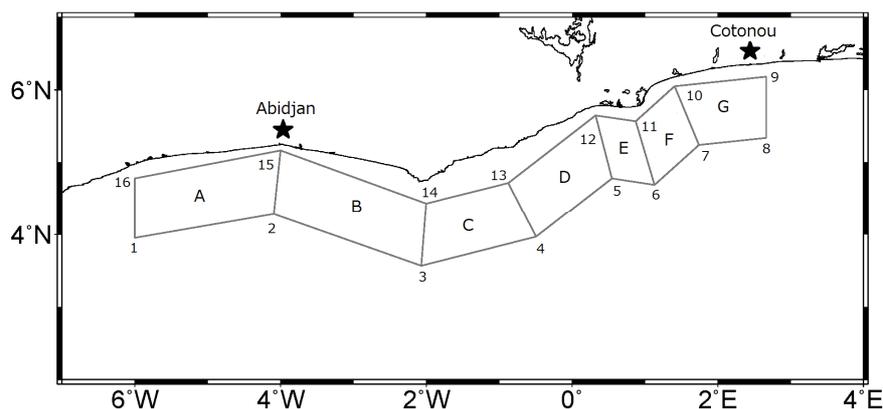


Figure4: Survey blocks set for the 2013 cetacean sighting survey conducted by COMHAFAT. Shallow waters less than 50 m are excluded from the blocks, for safe cruising.



Point No.	Lat.	Long.
1	3 57.0 N	6 0.0 W
2	4 17.0 N	4 5.5 W
3	3 34.0 N	2 4.0 W
4	3 58.0 N	0 29.5 W
5	4 47.0 N	0 33.0 E
6	4 41.5 N	1 8.0 E
7	5 14.5 N	1 44.5 E
8	5 20.5 N	2 40.0 E
9	6 11.0 N	2 40.0 E
10	6 3.0 N	1 24.5 E
11	5 34.0 N	0 52.5 E
12	5 39.0 N	0 19.5 E
13	4 43.0 N	0 52.5 W
14	4 26.0 N	2 0.0 W
15	5 10.0 N	4 0.0 W
16	4 47.0 N	6 0.0 W

Table 3: Coordinates of survey blocks set for the 2013 cetacean sighting survey in COMHAFAT zone (Côte d'Ivoire, Ghana, Togo, and Benin)

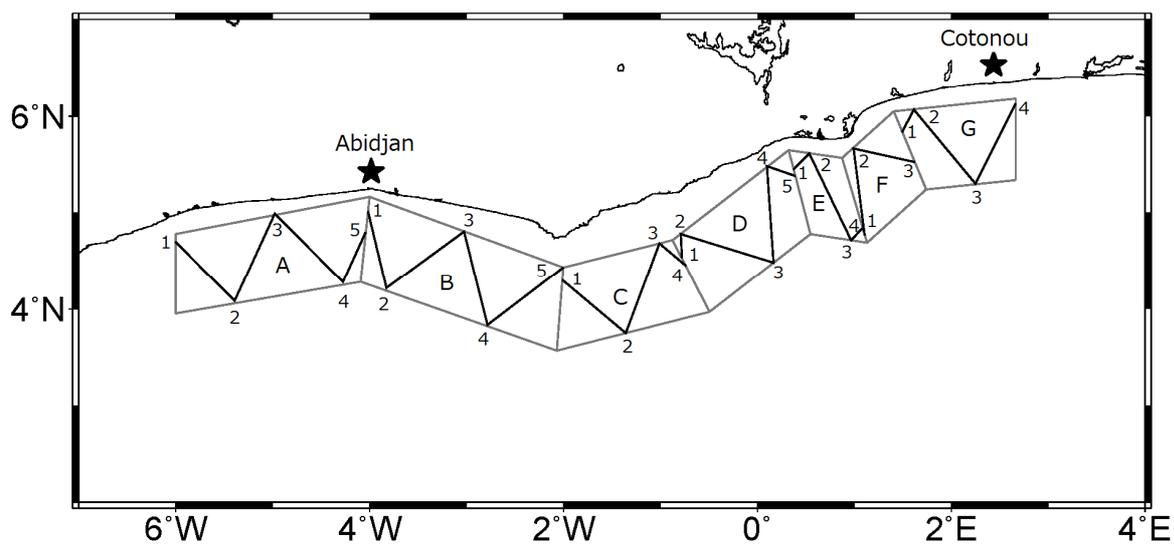


Figure 5: Survey track lines with around 1200 nm of length set in the survey blocks. Coordinates of points are listed in Table 2.

Table 4: Coordinates of track lines set in the survey blocks

Block	Point No.	Lat.	Long.	Dist (nm)
Abidjan		5 20.0 N	4 0.0 W	126.2
A	1	4 42.0 N	6 0.0 W	52.1
	2	4 5.0 N	5 23.5 W	60.0
	3	4 59.5 N	4 58.5 W	59.9
	4	4 17.0 N	4 16.5 W	34.0
	5	4 48.0 N	4 2.5 W	13.1
B	1	5 1.0 N	4 1.0 W	49.4
	2	4 13.0 N	3 49.5 W	59.8
	3	4 48.5 N	3 1.5 W	60.3
	4	3 50.0 N	2 47.0 W	59.4
	5	4 26.0 N	2 0.0 W	8.0
C	1	4 18.0 N	2 0.5 W	51.2
	2	3 45.0 N	1 21.5 W	59.8
	3	4 41.0 N	1 0.5 W	21.7
	4	4 27.0 N	0 44.0 W	5.6
D	1	4 32.0 N	0 46.5 W	15.0
	2	4 47.0 N	0 47.5 W	60.4
	3	4 29.0 N	0 10.0 E	60.1
	4	5 29.0 N	0 6.0 E	18.5
	5	5 23.0 N	0 23.5 E	4.1
E	1	5 27.0 N	0 22.5 E	13.8
	2	5 37.0 N	0 32.0 E	60.0
	3	4 43.0 N	0 58.0 E	10.3
	4	4 50.5 N	1 5.0 E	4.7
F	1	4 46.0 N	1 6.5 E	54.5
	2	5 40.0 N	0 59.5 E	39.0
	3	5 31.5 N	1 37.5 E	20.2
G	1	5 50.0 N	1 29.5 E	15.9
	2	6 4.0 N	1 37.0 E	59.7
	3	5 18.0 N	2 15.0 E	55.9
	4	6 8.0 N	2 40.0 E	19.9
Cotonou		6 21.0 N	2 25.0 E	
Total				1232.5

Before the survey, the research vessel, N/O GLC, was brought from Conakry to Abidjan. The vessel arrived in Abidjan on the morning of 23 March 2013. In the next day afternoon, all scientists were on board and then the vessel left Abidjan to the starting point and started the survey on the 24 March 2013.

A 15-days survey period was set from 23 March to 6 April, 2013. All the researchers embarked at the port of Abidjan and disembarked at the port of Cotonou. After the survey, a post-survey meeting is held in Cotonou, where data collected at the survey and results are discussed.

## RESULTS

The cetacean sighting survey with the N/O GENERAL LANSANA CONTE, in the coastal waters of Gabon, 232.1 nautical miles were searched. For this survey 49 schools for 456 animals were obtained. In primary and secondary sighting types, 22 schools for 135 animals were obtained in primary sighting and 27 schools for 321 animals in secondary sighting.

In terms of species sighted in primary and secondary sighting Humpback whale *Megaptera novaeangliae*, 13 schools for 50 animals were sighted in primary sighting and 17 schools for 141 animals were sighted in secondary sighting.

For Sperm whale *Physeter macrocephalus*, only one (1) school for one (1) animal was sighted for primary sighting and one school for one animal for secondary sighting.

*Balaenoptera borealis* was not sighted in primary sighting it is only one (1) school for 6 animals that was sighted in secondary sighting. Contrary to *Balaenoptera borealis*, *Balaenoptera edeni* was not sighted in secondary sighting, but one school for 2 animals were sighted in primary sighting.

*Stenella attenuata* was sighted only in secondary sighting with one (1) school for 150 animals whereas *Stenella frontalis* has been sighted in primary sighting with one (1) school for 40 animals. *Tursiops truncatus* also was sighted only in primary sighting with one (1) school for 25 animals (table 5).

Humpback whale *Megaptera novaeangliae* which was the most frequently sighted with 41.89%, and the Pantropical spotted dolphin *Stenella attenuata* comes with 32.89%. Atlantic spotted dolphin *Stenella frontalis* comes in the third position with 8.77%,. The unidentified dolphins represent 5.48% as they were fleeing the ship as soon as they are detected.

Bottlenose Dolphin *Tursiops truncatus* represents 5.48% of the sighted species. The unidentified whales come with 3.29%. Those as the unidentified dolphins run away from the vessel as soon as they are detected. The Sperm whale *Physeter macrocephalus* and the Bride's whale *Balaenoptera edeni* were sighted with 0.44% each. Sei whale *Balaenoptera borealis*, represent only 1.32% of the sighted species (table 6).

The unidentified whales were sighted in primary sighting with 2 schools for 2 animals and in secondary sighting with 6 schools for 13 animals. The unidentified dolphins were also sighted in primary sighting with 3 schools for 15 animals and in secondary sighting with 1 school for 10 animals.

Regarding to the distribution of the sighted species, it is noted that all these species are found in the northern part of the study zone. The sighting survey did not cover the entire study zone because the survey time was not enough (figure 7).

Table 5 : Cetacean species sighted in september 2011

Common Names	Noms scientifiques	Primary Sighting		Secondary sighting		Total	
		Schools	animals	Schools	animals	Schools	animals
Humpback whale	<i>Megaptera novaeangliae</i>	13	50	17	141	30	191
Sperm whale	<i>Physeter macrocephalus</i>	1	1	1	1	2	2
Sei Whale	<i>Balaenoptera borealis</i>	0	0	1	6	1	6
Bryde's whale	<i>Balaenoptera edeni</i>	1	2	0	0	1	2
Pantropical spotted dolphin	<i>Stenella attenuata</i>	0	0	1	150	1	150
Atlantic spotted dolphin	<i>Stenella frontalis</i>	1	40	0	0	1	40
Bottlenose dolphin	<i>Tursiops truncatus</i>	1	25	0	0	1	25
Unidentified whale	<i>Balaenoptera spp</i>	2	2	6	13	8	15
Unidentified Dolphin	<i>Dauphin spp</i>	3	15	1	10	4	25
Total		22	135	27	321	49	456

**Table 6 : Cetacean species sighted in September 2011**

Noms Communs	Scientific names	Initiaux des noms	Effectif	%
Bottlenose dolphin	<i>Tursiops truncatus</i>	TT	25	5.48
Atlantic spotted dolphin	<i>Stenella frontalis</i>	SF	40	8.77
Pantropical spotted dolphin	<i>Stenella attenuata</i>	SA	150	32.89
Unidentified dolphin	- spp	DI	25	5.48
Bryde's whale	<i>Balaenoptera edeni</i>	BE	2	0.44
Unidentified whale	- spp.	BI	15	3.29
Humpback whale	<i>Megaptera novaeangliae</i>	MN	191	41.89
Sei whale	<i>Balaenoptera borealis</i>	BB	6	1.32
Sperm whale	<i>Physeter macrocephalus</i>	PM	2	0.44
<b>TOTAL</b>			<b>456</b>	<b>100</b>

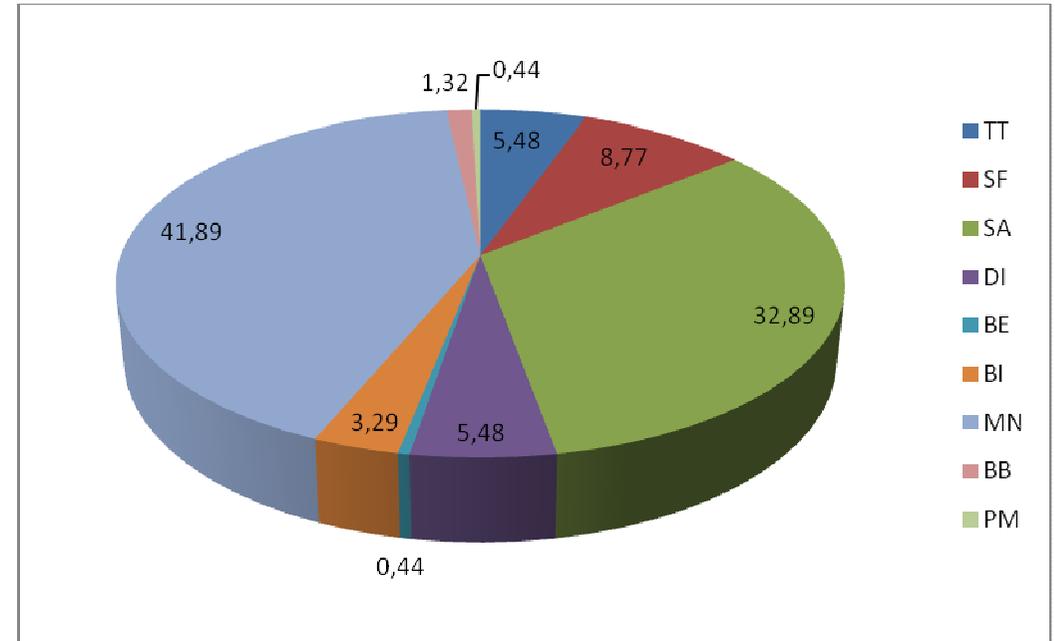
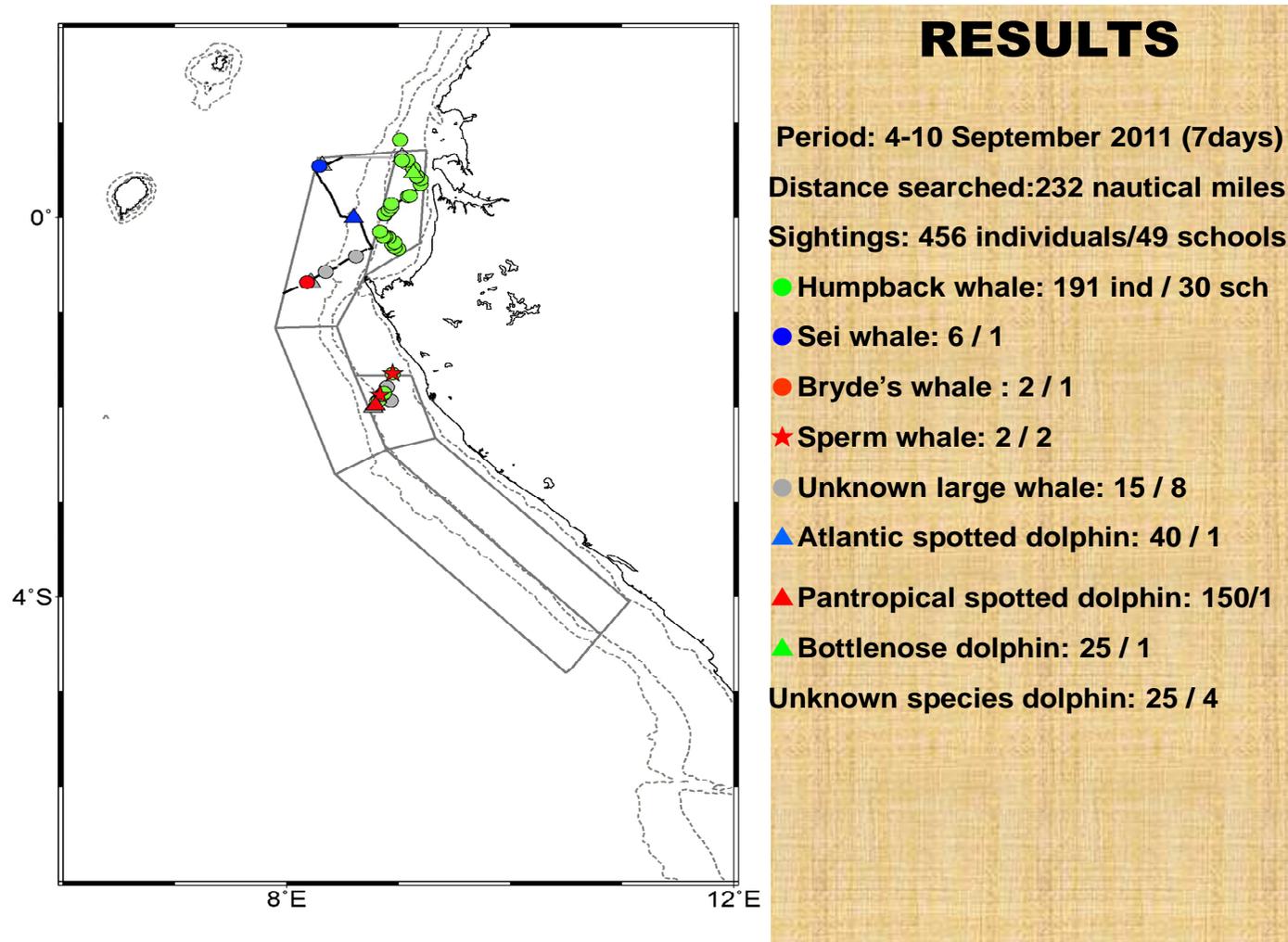


Figure 6 : Distribution in percentage of the sighted species



**Figure 7 :** Map of the study zone showing the blocks and the line transects cover during the survey and the results obtain

### **Cetacean sighting survey in the gulf of Guinea**

As for the first sighting survey in the Gabon coastal waters, two types of sightings have been also used for this cetacean sighting survey: the primary sighting and the secondary sighting. For all species, 34 schools, for 2498 animals were sighted. Among those, 28 schools for 2213 were obtained in primary sighting and 6 schools for 285 animals in secondary sighting

Regarding the species sighted, Bottlenose dolphin *Tursiops truncatus* with one (1) school and 15 animals, and Rough-toothed dolphin *Steno bredanensis* with 1 school and 10 animals were obtained with the primary sighting type. Those two species were not sighted with the secondary sighting type.

For the shortfinned pilot whale *Globicephala macrorhynchus*, 6 schools for 269 animals were sighted in primary sighting and 1 school for 10 animals in secondary sighting. In total for this species 7 schools for 279 animals were obtained.

With the Risso's dolphin *Grampus griseus*, 2 schools for 122 animals were sighted in primary sighting only. There were no sightings with the secondary sighting type.

For the Bride's whale *Balaenoptera edeni*, there was only 1 school for 1 animal sighted in primary sighting, there was no secondary sighting made for this species like *Grampus griseus*.

The Pantropical spotted dolphin *Stenella attenuata*, 4 schools for 160 animals there were 3 schools for 125 animals sighted in primary sighting and 1 school for 35 animals sighted in secondary sighting.

For Atlantic spotted dolphin *Stenella frontalis*, there were in total 5 schools for 692 animals obtained. Among them, 4 schools for 677 animals were sighted in primary sighting, and 1 school for 15 animals sighted in secondary sighting.

For the Pygmy Killer whale, *Feresa attenuata*, there were in total 4 schools for 540 animals obtained. Among them, 2 schools for 320 animals were sighted in primary sighting, and 2 schools for 540 animals sighted in secondary sighting

Regarding the Common dolphin *Delphinus delphis*, there were 6 schools for 652 animals sighted in primary sighting. There was no secondary sighting.

The unidentified dolphins were sighted, 3 schools for 22 animals in primary sighting and 2 schools for 5 animals in secondary sighting. That made in total of 4 schools for 27 animals.

In terms of species distribution, it has been noted that *Delphinus delphis*, *Stenella frontalis*, *Globicephala macrorhynchus* and the unidentified dolphins are largely distributed in the study zone whereas *Feresa attenuata* and *Grampus griseus* are weakly distributed. Those are found in two areas in the Ghanaian EEZ.

*Steno bredanensis* and *Tursiops truncatus* have been sighted one time in the Côte d'Ivoire EEZ. *Balaenoptera edeni* also has been sighted only for one time in the Ghanaian EEZ. These 3 species are weakly distributed in the study area (table 7) and (figure 9 a, b).

The thing that has to be remembered that is all the sightings have been made in the Ghanaian and Côte d'Ivoire EEZ. In Togo and Benin EEZ, the meteorological conditions were not so good to allow cetacean sightings.

So for this cetacean sighting surveys in the gulf of Guinea, with a search of 1004.14 nautical miles, 34 schools and 2498 individuals all cetacean species mixed were obtained with a predominant Atlantic spotted dolphin *Stenella frontalis* with 27.70% and comes the Common dolphin *Delphinus delphis* with 26.10% and Pygmy killer whale *Feresa attenuata* with 21.62%.

The shortfinned pilot whale *Globicephala macrorhynchus* has 11.17%. and the Pantropical spotted dolphin *Stenella attenuata* comes with 6.41% and the Risso's dolphin with 4.88%

The unidentified dolphins with 1.08%, Bottlenose dolphin *Tursiops truncatus* with 0.6% and Rough-toothed dolphin *Steno bredanensis* with 0.4% are weakly represented in the sightings as well as the Bride's whale *Balaenoptera edeni*, with 0.04 % (table 8).

In conclusion, during the two cetacean sighting surveys it has been noted that the whales were weakly sighted in the gulf of Guinea. *Balaenoptera borealis*, *Physeter macrocephalus* and *Megaptera novaeangliae* were not sighted. Dolphins were mostly sighted during the two surveys. In the Gabon survey the species *Feresa attenuata*, *Globicephala macrorhynchus*, *Grampus griseus*, *Steno bredanensis* and *Delphinus delphis*, were no sighted. (table 9).

Table7 : Cetacean species sighted in 2013

Common names	Scientific names	Primary sighting		Secondary sighting		Total	
		Schools	Animals	Schools	animals	Schools	animals
Bottlenose dolphin	<i>Tursiops truncatus</i>	1	15	0	0	1	<b>15</b>
Rough-toothed dolphin	<i>Steno bredanensis</i>	1	10	0	0	1	<b>10</b>
Shortfinned pilot whale	<i>Globicephala macrorhynchus</i>	6	269	1	10	7	<b>279</b>
Risso's dolphin	<i>Grampus griseus</i>	2	122	0	0	2	<b>122</b>
Bryde's whale	<i>Balaenoptera edeni</i>	1	1	0	0	1	<b>1</b>
Pantropical spotted dolphin	<i>Stenella attenuata</i>	3	125	1	35	4	<b>160</b>
Atlantic spotted dolphin	<i>Stenella frontalis</i>	4	677	1	15	5	<b>692</b>
Unidentified Dolphin	<i>Stenella spp.</i>	3	22	2	5	5	<b>27</b>
Pygmy killer whale	<i>Feresa attenuata</i>	2	320	2	220	4	<b>540</b>
Common dolphin	<i>Delphinus delphis</i>	6	652	0	0	6	<b>652</b>
<b>TOTAL</b>		<b>28</b>	<b>2213</b>	<b>6</b>	<b>285</b>	<b>34</b>	<b>2498</b>

Table 8 : Cetacean species sighted in 2013

Scientific names	Nik names	Effectif	%
<i>Tursiops truncatus</i>	TT	15	0.60
<i>Stenella frontalis</i>	SF	692	27.70
<i>Stenella attenuata</i>	SA	160	6.41
- spp	DI	27	1.08
<i>Balaenoptera edeni</i>	BE	1	0.04
<i>Steno bredanensis</i>	SB	10	0.40
<i>Globicephala macrorhynchus</i>	GM	279	11.17
<i>Grampus griseus</i>	GG	122	4.88
<i>Feresa attenuata</i>	FA	540	21.62
<i>Delphinus delphis</i>	DD	652	26.10
<b>TOTAL</b>		<b>2498</b>	<b>100</b>

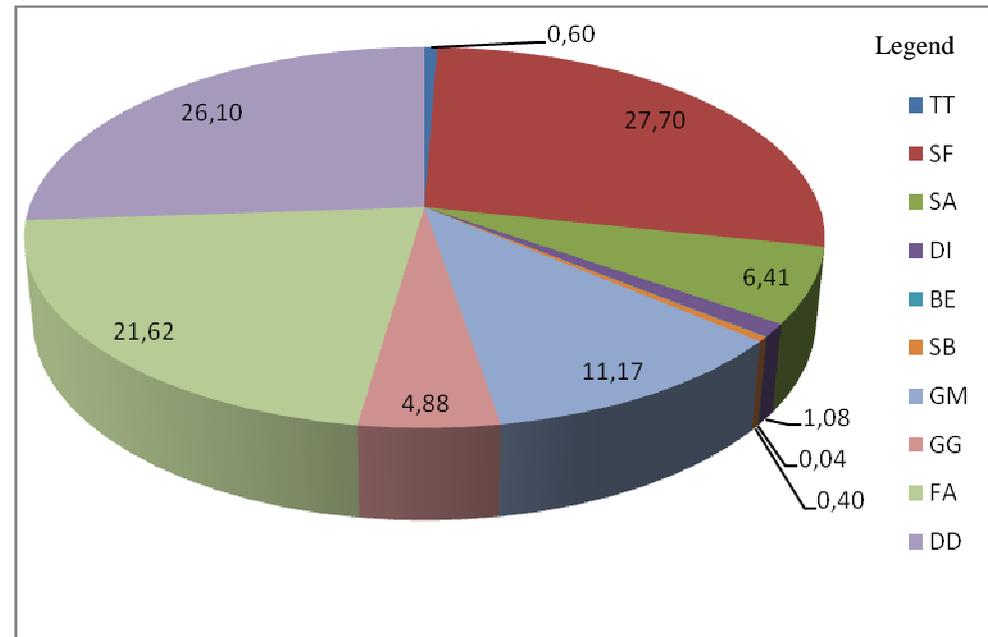


Figure 8 : Distribution in percentage of the sighted species

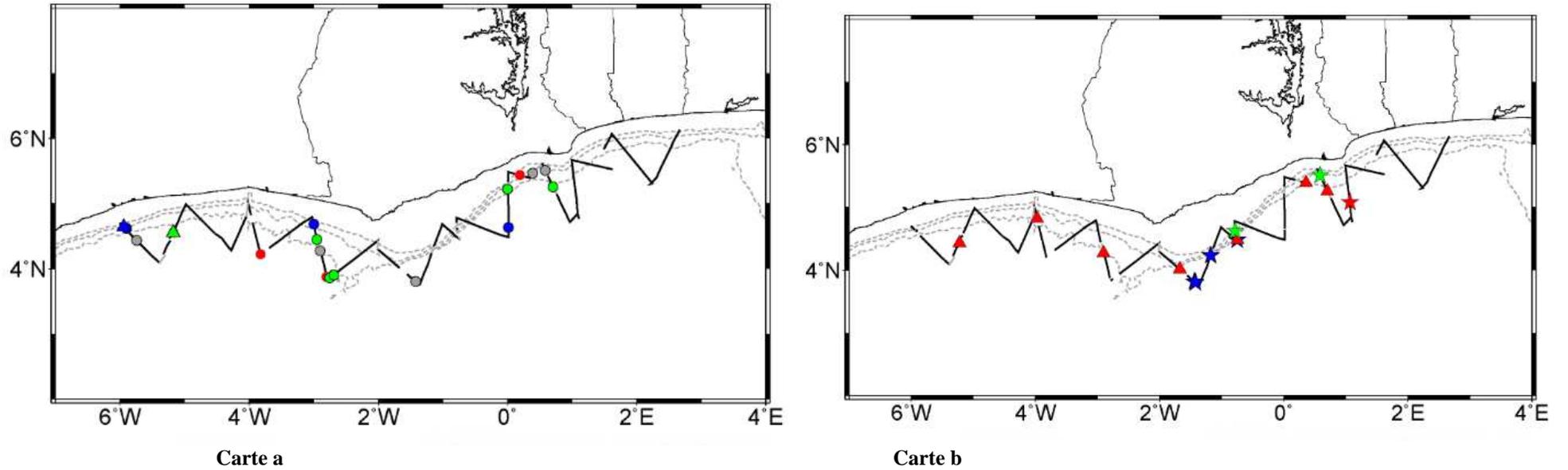


Figure9 a et b : Map of the gulf of Guinea showing the zigzag tracks lines and cetacean sightings made during the survey.

● *Stenella frontalis* 692 ind / 5 sch

● *Stenella attenuata* 160 / 4

▲ *Tursiops truncatus* 15 / 1

● *Delphinus delphis* : 652 / 6

● Unidentified dolphin : 27 / 5

▲ *Steno bredanensis*: 10 / 1

▲ *Globicephala macrorhynchus*: 29 / 7

★ *Balaenoptera edeni* 1 / 1

★ *Feresa attenuata* 540 / 4

★ *Grampus griseus* 122 / 2

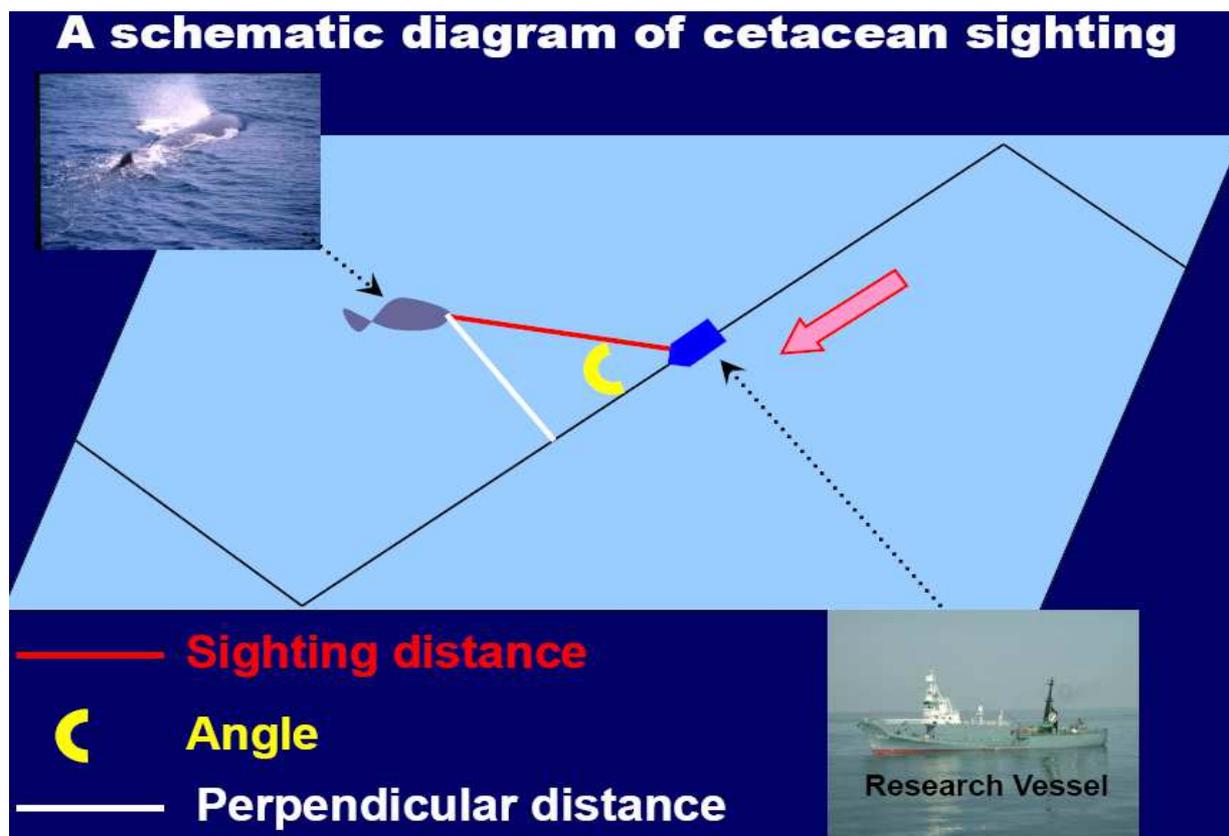
Table 9 : Cetacean species sighted in September 2011 and March-April 2013

Scientific names	Nick names	Effectif	
		Gabon	Golfe de Guinée
<i>Tursiops truncatus</i>	TT	25	15
<i>Stenella frontalis</i>	SF	40	692
<i>Stenella attenuata</i>	SA	150	160
<i>Dolphins- spp</i>	DI	25	27
<i>Balaena - spp</i>	BI	15	0
<i>Balaenoptera edeni</i>	BE	2	1
<i>Megaptera novaeangliae</i>	MN	191	0
<i>Steno bredanensis</i>	SB	0	10
<i>Globicephala macrorhynchus</i>	GM	0	279
<i>Grampus griseus</i>	GG	0	122
<i>Feresa attenuata</i>	FA	0	540
<i>Delphinus delphis</i>	DD	0	652
<i>Balaenoptera borealis</i>	BB	6	0
<i>Physeter macrocephalus</i>	PM	2	0
<b>TOTAL</b>		<b>456</b>	<b>2498</b>

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## Annexes



## Sighting Position tour



**Upper deck sighting position**





Sighting record form

Sighting record form																				
Vessel			Date			Time			Sighting No.			Type		Recorder						
			05																	
			Year Month Day			Hour Min.														
R/L	Angle	Distance	Unit of distance	Cue at	Seen by	Swimming direction		Position of vessel						Event	Course	C/T	Closest distance	Unit of distance	Time Let	
						R/L	Angle	Latitude			Longitude								Hour	Min.
								Deg.	Min.	WS	Deg.	Min.	EW							
Species					Pod size					No. of	No. of									
Name					Code	Best	Min.	Max.	Calves	photos										
1																				
2																				
3																				
Comments																				



Baleine à bosse *Megaptera novaeangliae*



*Megaptera novaeangliae*



Tête de *Megaptera novaeangliae*



Queue de *Megaptera novaeangliae*

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**Photo :** Après une séance d'identification des cétacés en mer  
Wagué (Mauritanie), Diallo (Guinée), Quarter (Ghana) et Touré (Guinée, Commandant du navire GLC)





**Family photo during the 2011 surey in Gabon**