SC/69B/SM/15

Sub-committees/working group name: SM

Atlantic humpback dolphin (Sousa teuszii) in Guinea, West Africa

T. Genov, A. Malapert, A. Sane, A. Souma, M. Sangare, A.M. Camara, Y.S. Camara, P. Cueto, Marine Marc , Tim Collins, Gianna Minton

Atlantic humpback dolphin (*Sousa teuszii*) in Guinea, West Africa

Tilen GENOV[1,2], Aurore MALAPERT[3], Aboubacar SANÉ[4], Aminata SOUMAH[5], Mamoudou SANGARÉ[6], Aboubacar Mabinty CAMARA[6], Yamoussa Salifou CAMARA[4], Pauline CUETO[6], Marine MARC[6], Tim COLLINS[1,7], Gianna MINTON[1,8]

Contact e-mail: tilen.genov@gmail.com

1) Consortium for the Conservation of the Atlantic Humpback Dolphin (CCAHD)
2) Morigenos – Slovenian Marine Mammal Society, Piran, Slovenia
3) Biotope International, Montpellier, France
4) Centre National des Sciences Halieutiques de Boussoura (CNSHB), Conakry, Guinea
5) Guinée Ecologie, Conakry, Guinea
6) Biotope Guinée, Conakry, Guinea
7) Global Program, Wildlife Conservation Society, New York, USA
8) Megaptera Marine Conservation, Wassenaar, Netherlands

ABSTRACT

The Critically Endangered Atlantic humpback dolphin (*Sousa teuszii*) is one of the four most threatened cetaceans globally, and the second most threatened small cetacean species. Endemic to a very narrow strip of coastal waters along western Africa, the ecology of this species is extremely poorly known, with little information on abundance, population structure, vital rates or mortality. Even the occurrence of this species in several countries within its known range remains uncertain. The leading threat is bycatch in artisanal fishing gear, but coastal development, including mining, port construction and associated coastal development projects, is also increasingly degrading habitats. These threats will continue to drive the species to extinction in the near future unless effective conservation measures are identified and implemented. To address some of the vital knowledge gaps hindering effective conservation, the occurrence, abundance and habitat use of this species was studied in the waters of the Republic of Guinea in West Africa during 2022-2023. The work, which included capacity building and community engagement, was implemented by a collaboration of national and international scientists. Boat surveys were carried out in three different areas along the Guinean coast, combining line-transect surveys, photo-identification, drone imaging and sampling of water parameters. Unlike in many other parts of the species' range, humpback dolphins were observed relatively far from shore on several occasions, though always within the species' known preferred depth ranges. Females with calves were observed in most groups. Photo-identification across different seasons provided evidence of site fidelity. While surveys were challenging, and required excellent teamwork to persevere, they also highlight the scarcity of resources and opportunities available to scientists and conservationists in Guinea and the wider region.

KEYWORDS: ATLANTIC HUMPBACK DOLPHIN; *SOUSA TEUSZII*; PHOTO-ID; SURVEYS; SITE FIDELITY; WEST AFRICA; GUINEA

INTRODUCTION

The Critically Endangered Atlantic humpback dolphin (*Sousa teuszii*) is one of the four most threatened cetaceans globally, and the second most threatened small cetacean species (Collins, 2015; Collins *et al.*, 2017; Braulik *et al.*, 2023). Endemic to a very narrow strip of coastal waters along western Africa (Van Waerebeek *et al.*, 2004; Weir & Collins, 2015), the ecology of this species is extremely poorly known, with almost no detailed information on abundance, population structure, vital rates or mortality (Collins *et al.*, 2017). Even the occurrence of this species in several countries within its known range remains uncertain (Collins, 2015; Weir & Collins, 2015). The leading threat is bycatch in artisanal fishing gear (Collins, 2015; Collins *et al.*, 2017; Brownell *et al.*, 2019), but coastal development, including mining, port construction and associated coastal development projects, is also increasingly degrading habitats (Collins *et al.*, 2017). These threats will continue to drive the extirpation of local populations and the species towards extinction in the near future unless effective conservation measures are identified and implemented.

To date, relatively few studies have focused on Atlantic humpback dolphins in Guinea. Cadenat (1956) observed the species (then described as *Sotalia teuszii*) in 1953 in the "silt-laden inshore waters of French Guinea, south of Conakry". Bamy (2011) sighted about 25 Atlantic humpback dolphins in shallow waters near the Tristão Islands in September 2011. Van Waerebeek et al. (2017) describe a sighting in June 2012 of a large scattered mixed-age group (including a calf) of *ca*. 40 (30-45) Atlantic humpback dolphins near Katfoura Island, Tristão Islands. During October-November 2013, Weir (2015) reported five sightings containing a minimum of 47 animals (based on photo-identification), including calves, around the Río Nuñez Estuary. A 2017 boat- and beach-based survey in the Tristão Islands documented the continued presence of the species, with 2 live sightings and the beached remains of a further 4 individuals (Bamy *et al.*, 2021).

To address some of the vital knowledge gaps hindering effective conservation, the occurrence, abundance and habitat use of this species in the waters of the Republic of Guinea in West Africa was studied during 2022-2023. The work, which included capacity building and community engagement, was implemented within a collaborative project developed under the umbrella of the Consortium for the Conservation of the Atlantic humpback dolphin (CCAHD), and involving Biotope Guinée, Centre National des Sciences Halieutiques de Boussoura (CNSHB) and Guinée Ecologie, and supported by Mubadala Investment Company and its asset Guinea Alumina Corporation, and managed by the Mohamed Bin Zayed Species Conservation Fund (MBZ Fund).

METHODS

Study Areas and field procedures

Surveys were carried out in three study sites: 1) around the Tristão Islands and off the Río Nuñez Estuary, 2) the Boffa area, 3) the Iles de Loos islands - Conakry (Fig. 1). The areas off Río Nuñez Estuary and the Tristão Islands were targeted based on previous work by Weir (2015) and Bamy et al. (2021), respectively. Surveys were carried out in June 2022 and November 2022 around the Tristão Islands and off the Río Nuñez Estuary, and in June 2023 in the area of Boffa and the Iles de Loos - Conakry. Surveys were carried out from various vessels, including a ~8m pirogue with 15-40 horse power (HP) outboard engines, ~5-6m fiberglass boats with 150-250 HP outboard engines and a ~7m aluminium steel boat with two 75 HP outboard engines. Surveys were preferentially carried out in good sighting

conditions (no precipitation and Beaufort sea state up to 2), although some were conducted in less ideal conditions (Beaufort 3–4 and occasional rain). A total of 3–5 observers participated in the surveys, accompanied by 2–3 local fishermen/guides/crew. The survey design consisted of a mixture of pre-determined transects (in the open sea) and ad libitum surveys (inside channels), but the surveys were often carried out according to local weather conditions, logistical considerations, tides and local bathymetric features (especially sand banks), some of which were not visible on charts and Google Earth images consulted when planning transects. Navigation speeds during dedicated search effort varied between 7 and 20 km/h, depending on the boat, sea conditions and local features. Information on time, GPS position, sea conditions, visibility and speed were collected at regular intervals. Boat navigation tracks and dolphin positions were recorded using a GPS. When sea conditions allowed, habitat readings (depth, temperature, salinity and turbidity) were collected with a YSI meter periodically and when dolphins were sighted. Temperature, salinity and turbidity were recorded at 1 m, 3 m and 5 m depths, water depth allowing.

When dolphins were sighted, search effort was suspended and focal follows commenced. Information on behaviour, group size, group composition (including presence or absence of calves) was recorded. An attempt was made to photograph dorsal fins of all members of the group for individual photo-identification. Groups were followed for variable amounts of time, depending on their approachability, behaviour, sea conditions, time of day and the amount of data already collected on the group. Aerial footage using an unmanned aerial vehicle DJI Mini 2 was collected during some encounters.

RESULTS

A total of 2077 km and 141 hours were spent navigating at sea (561 km in June 2022, 1034 km in November 2022, 483 km in June 2023), with 1163 km and 79 hours spent on search effort (Table 1, Fig. 1–4).

Table 1. Summary of survey effort and sighting of Atlantic humpback dolphins.

Period	Study site	Total navigation (km)	Total effort (km)	Time on navigation (hh:min)	Time on effort (hh:min)	Dolphin sightings	Sightings per 100 km effort
Jun-2022	Tristão Islands - Río Nuñez Estuary	561	389	50:44	32:28	5	0.257
Nov-2022	Tristão Islands - Río Nuñez Estuary	1034	461	64:38	27:41	2	0.217
Jun-2023	Boffa	200	138	10:50	08:17	0	0
Jun-2023	Iles de Loos - Conakry	283	175	15:03	10:16	0	0

A total of 7 sightings of Atlantic humpback dolphins were recorded (5 in June 2022, 2 in November 2022 and 0 in June 2023). Three of these sightings were recorded while on effort, with the remaining four were recorded off-effort (either in transit or while already observing common bottlenose dolphins, *Tursiops truncatus*), resulting in an overall sighting rate of 0.09 groups per 100 km surveyed across all study areas. A total of 6h 41 min were engaged in focal follows of the species. Six of these sightings were recorded in the Río Nuñez Estuary study site, while one was recorded off the Tristão Islands. No sightings were recorded off Boffa or Iles de Loos - Conakry.

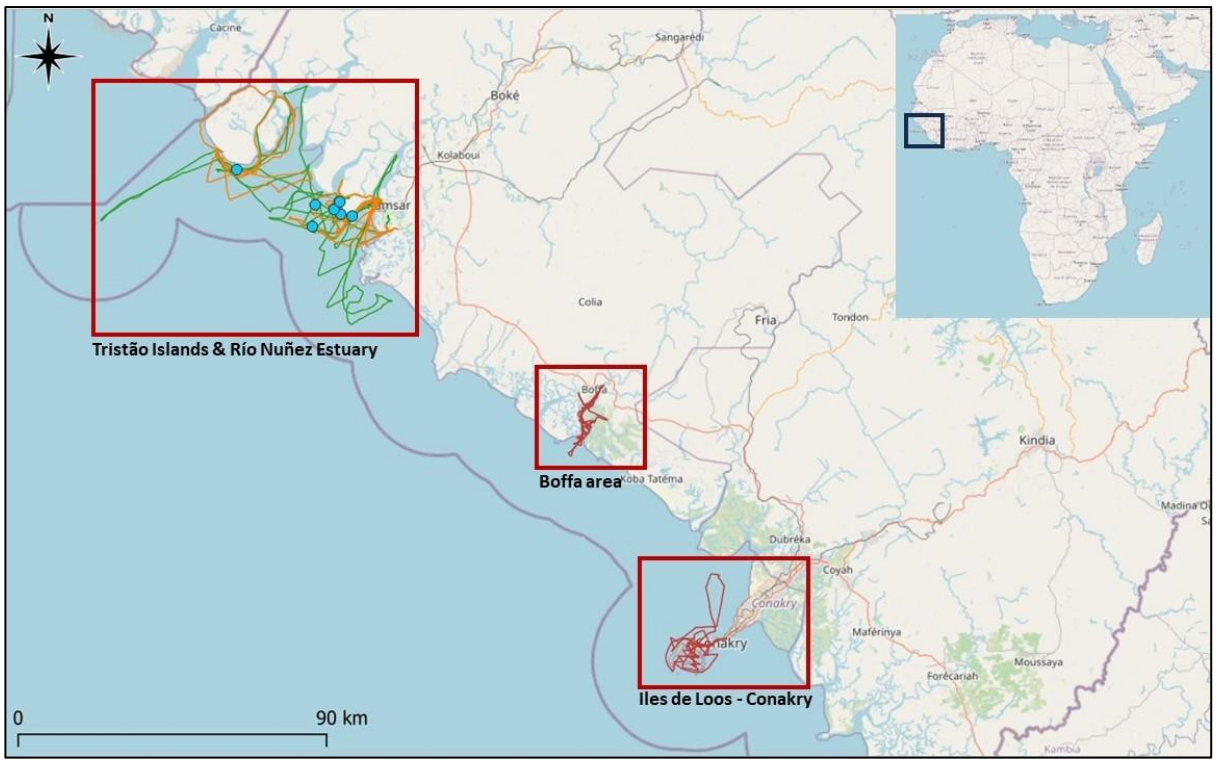

Fig. 1. Survey effort (navigation tracks) and sightings of Atlantic humpback dolphins (•) in four study sites in Guinea during 2022-2023 (— June 2022, — November 2022, — June 2023).

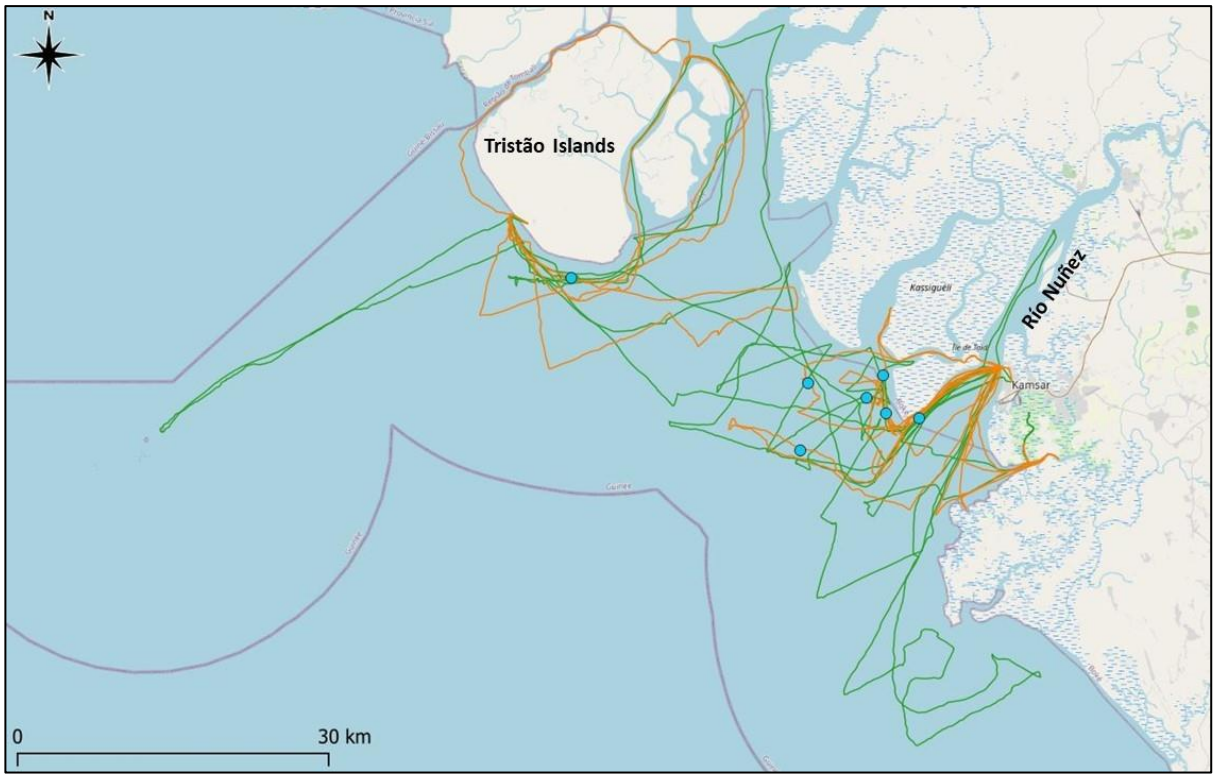

Fig. 2. Survey effort (navigation tracks) and sightings of Atlantic humpback dolphins (•) in the Tristão Islands and the Río Nuñez Estuary study site (— June 2022, — November 2022).

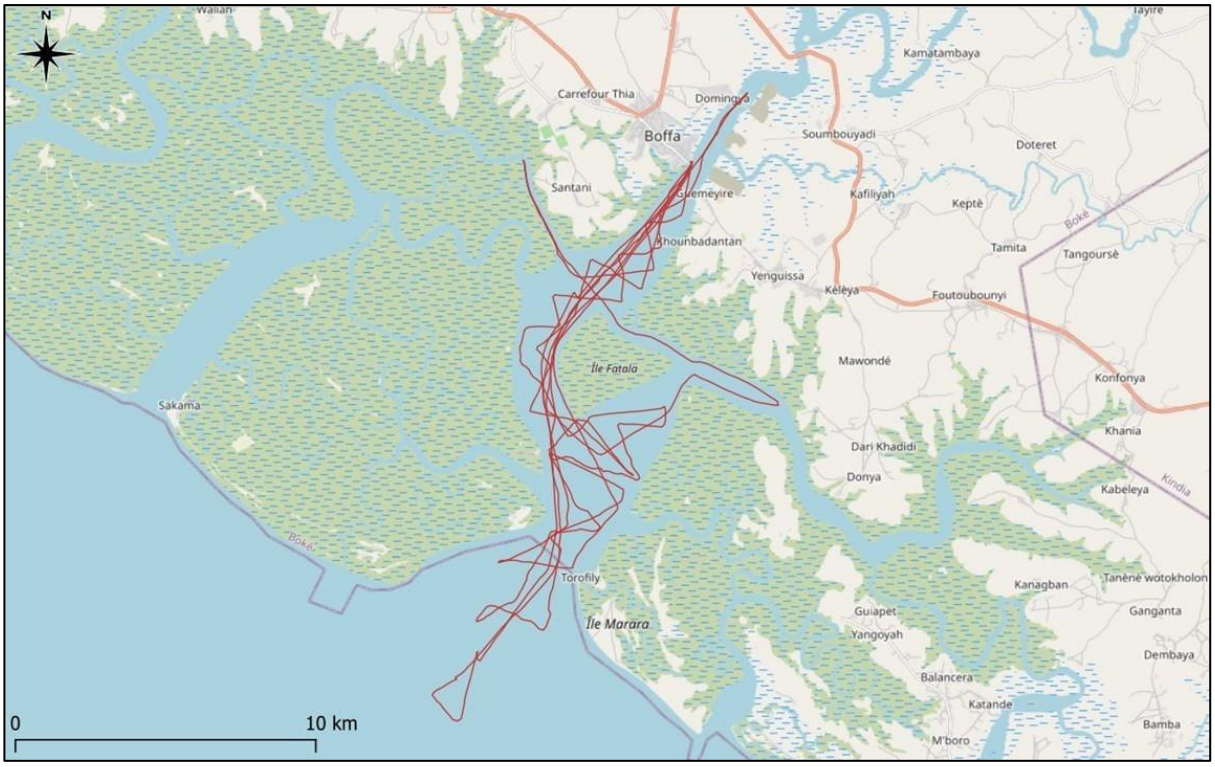

Fig. 3. Survey effort (navigation tracks) in the Boffa study site.

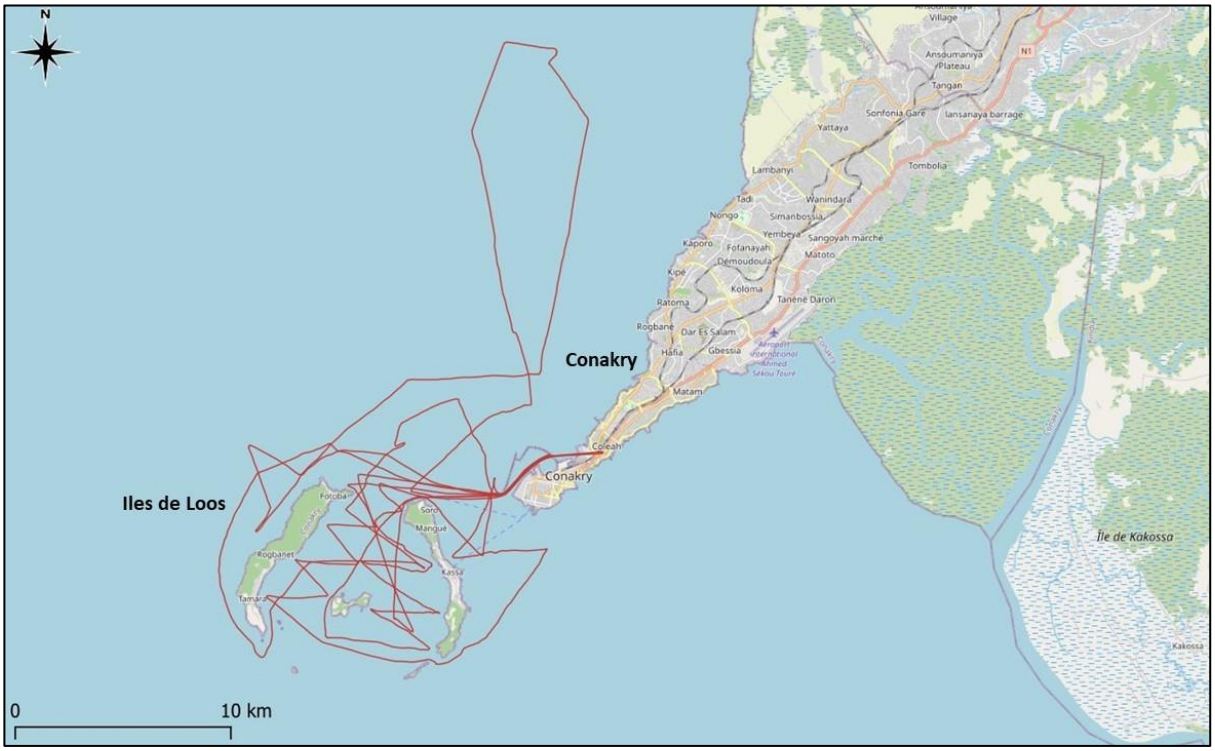

Fig. 4. Survey effort (navigation tracks) in the Iles de Loos - Conakry study site.

Mean group size, as estimated in the field, was 6 animals (SD = 3.9, median = 6, range = 1–12). However, photo-identification data showed that some of the field estimates were underestimates, particularly for larger and more dispersed groups. Accordingly, the mean group size, based on the minimum number of individuals (either estimated in the field or identified from photographs), was 8.9 animals (SD = 8.2, median = 6, range = 1–21). Calves were recorded in 85.7 % of all sightings.
A total of 43 individuals could be distinguished from photographs. Several individuals off Río Nuñez Estuary were re-sighted across different days in June 2022, while two individuals photographed there in June 2022 were re-sighted in the same area in November 2022 (Fig. 5–6).

Figure 5. Two photo-identified Atlantic humpback dolphins sighted in June 2022 (left) and November 2022 (right). Photographs: Tilen Genov, CCAHD.

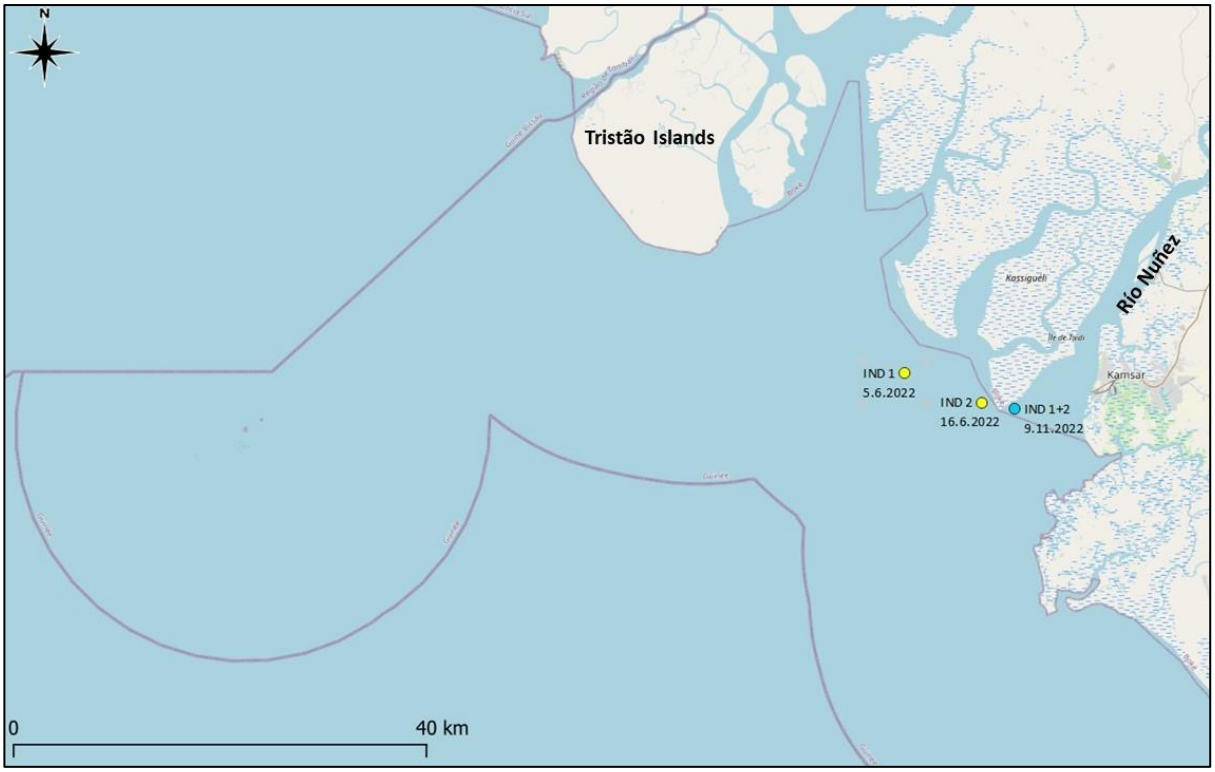

Figure 6. Sighting locations of individuals re-sighted between June and November 2022. Two individuals, initially photographed on 5 June 2022 and 16 June 2022, respectively, were both observed in the same group on 9 November 2022.

The project also included three half-day class-room based training sessions on cetacean biology and ecology and cetacean survey techniques. During the course of the boat-based fieldwork XX Guinean scientists (2 from the national marine and aquatic research institute – CNHSB, and 2 from Biotope Guinée, and 1 from the local NGO, Guinee Guinée) were involved in data collection, entry and analysis.

DISCUSSION

Despite relatively challenging weather and logistical conditions, the seven sightings of Atlantic humpback dolphins, including mothers with calves, are encouraging. Work carried out by Weir (2015), began the process of describing the importance of the Río Nuñez Estuary for this species, with 6 sightings of 47 individuals. Even though our small sample size is relatively small, these results further suggest that the waters off the Río Nuñez Estuary, and particularly west of the island of Taidi, may provide very important habitat for this species. The available photo-identification evidence suggests that several animals displayed site fidelity to this area at least across different days and some across different seasons. Collection of further photo-identification data will help to elucidate any long-term patterns, including residency. Given the proximity of Atlantic humpback dolphin sightings to Guinea-Bissau, and the documented presence of the species there (Leeney *et al.*, 2016), further work should also focus on potential movements and connectivity of animals between the two countries, possibly via transboundary efforts.

As part of the wider project, new collaborations, partnerships and synergies were also developed with local fishers, fisheries authorities and marine protected area managers. Over 600 structured interviews were conducted with fishers in three separate provinces in Guinea to gain insight into

fishing practices and coastal community members' local ecological knowledge of the diversity and occurrence of whales and dolphins in the area. The results of these surveys are undergoing analysis and, together with the results of these preliminary surveys, will help guide further research efforts. The final boat-based survey under the current funding framework will be conducted in the Río Nuñez Estuary and Tristão Islands area in May 2024. It is hoped that this will yield more Atlantic humpback dolphin sightings and photographs that can be used to augment the photo-identification catalogue and conduct mark-recapture abundance estimates, as well as to refine insight into the population's ranging patterns.

Furthermore, relationships forged with fishers, port authorities and other community members during both boat-based and interview surveys have led to the formation of a stranding and sighting reporting network that will help augment the collection of data of Atlantic humpback dolphins beyond the lifespan of the three-year funded project. From May 2024 the project will also initiate a series of community outreach and education events, using the results of surveys, as well as a children's picture book that has been created under the wider project to raise awareness of the species and its conservation needs among fishers, fishmongers, port authorities, marine protected area managers and schoolchildren.

The boat surveys encountered numerous logistical difficulties, most of them related to the limited availability of vessels suitable for dolphin survey work. Daily rental fees for the one vessel with an appropriate deck and hull configuration and engines powerful and reliable enough for safe navigation over long distances in open water were 3–6 times higher than a similar vessel would cost in other countries in the region. Additionally, even in the large port area of Kamsar and with the full collaboration of government research agencies, docking facilities are limited, leaving the vessel stranded at low tides. Future surveys need to take into account these logistical challenges and ensure sufficient budget and support to manage them.

The current funding framework for this project will come to an end in August 2024, with field surveys ending in May 2024, after which all of the data collected will be compiled into a final report and prepared for a minimum of two manuscripts for submission to peer-reviewed journals. The project partners are seeking funding and support for continuation of the project, and request the IWC SC to recommend the continuation and extension of the work presented here to include:

- Boat-based survey work in the areas that were already surveyed in 2022 and 2023, as well as new areas (e.g., the Forecariah province further south near the border with Sierra Leone, where fishers report seeing dolphins frequently, but were not able to distinguish between Atlantic humpback and bottlenose dolphins).
- Continued support for Guinean scientists and trainees involved in the project to ensure that they can continue to collect, archive and analyse data.
- Support for the Guinean scientists and/or organisations that will continue to manage the reporting network to ensure that reports are centrally archived and can be used for analysis of cetacean distribution and threats. Ideally, this will include the use of the SIREN smartphone App developed by AAMCO in Cameroon (see https://www.sousateuszii.org/2024/03/07/smartphone-app-promotes-citizen-science-to-address-data-gaps-in-cameroon-and-beyond/), which includes a database and reporting system and support for database managers, or a national database model similar to that used by researchers in Ghana (see SC/69B/HIM/17).
- The use of passive acoustic monitoring to assess Atlantic humpback dolphin presence in and around the Kamsar Port, as well as the levels of underwater noise and shipping traffic that may pose a threat to the population that has been documented in this area.

REFERENCES

Bamy, I., Djiba, A. and Van Waerebeek, K. 2021. Recent survey for delphinids at Tristao Islands, Guinea, reinforces concern for bycatches and marine bushmeat use. Preprints 2021, 2021040094. https://doi.org/10.20944/preprints202104.0094.v1.

Bamy, I.L. 2011. Inventaire des cétacés dans la zone des Iles Tristao. Projet de Gestion Côtière et Marine de la Biodiversité. Ministère de la Pêche et de l'Aquaculture, Conakry, Guinée.

Braulik, G.T., Taylor, B.L., Minton, G., Notarbartolo di Sciara, G., Collins, T., Rojas-Bracho, L., Crespo, E.A., Ponnampalam, L.S., Double, M.C. and Reeves, R.R. 2023. Red-list status and extinction risk of the world's whales, dolphins, and porpoises. Conservation Biology 375: e14090.

Brownell, R.L.J., Reeves, R.R., Read, A.J., Smith, B.D., Thomas, P.O., Ralls, K., Amano, M., Berggren, P., Chit, A.M., Collins, T., Currey, R., Dolar, M.L.L., Genov, T., Hobbs, R.C., Kreb, D., Marsh, H., Zhigang, M., Perrin, W.F., Phay, S., Rojas-Bracho, L., Ryan, G.E., Shelden, K.E.W., Slooten, E., Taylor, B.L., Vidal, O., Ding, W., Whitty, T.S. and Wang, J.Y. 2019. Bycatch in gillnet fisheries threatens Critically Endangered small cetaceans and other aquatic megafauna. Endangered Species Research 40: 285-296.

Cadenat, J. 1956. Un delphinidae encore mal connu de la côte occidentale d'Afrique: *Sotalia teuszii* Kükenthal 1892. Bulletin de l'Institut Français d'Afrique Noire 18: 555-566.

Collins, T. 2015. Re-assessment of the conservation status of the Atlantic humpback dolphin, *Sousa teuszii* (Kükenthal, 1892), using the IUCN Red List criteria. In Jefferson, T.A. and Curry, B.E. (eds) *Advances in Marine Biology, Vol. 72 - Humpback Dolphins (Sousa spp.): Current Status and Conservation, Part I.* Oxford: Academic Press, pp 47-77.

Collins, T., Braulik, G.T. and Perrin, W. 2017. *Sousa teuszii* (errata version published in 2018). *The IUCN Red List of Threatened Species 2017: e.T20425A123792572. https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T20425A50372734.en.*

Leeney, R.H., Weir, C.R., Campredon, P., Regalla, A. and Foster, J. 2016. Occurrence of Atlantic humpback (*Sousa teuszii*) and bottlenose (*Tursiops truncatus*) dolphins in the coastal waters of Guinea-Bissau, with an updated cetacean species checklist. Journal of the Marine Biological Association of the United Kingdom 964: 933-941.

Van Waerebeek, K., Barnett, L., Camara, A., Cham, A., Diallo, M., Djiba, A., Jallow, A., Ndiaye, E., Bilal, A. and Bamy, I. 2004. Distribution, status, and biology of the Atlantic humpback dolphin, *Sousa teuszii* (Kukenthal, 1892). Aquatic Mammals 301: 56-83.

Van Waerebeek, K., Uwagbae, M., Segniagbeto, G., Bamy, I.L. and Ayissi, I. 2017. New records of Atlantic humpback dolphin (*Sousa teuszii*) in Guinea, Nigeria, Cameroon and Togo underscore pressure from fisheries and marine bushmeat demand. Revue d'Ecologie (Terre et Vie) 722: 192-205.

Weir, C. 2015. Photo-identification and habitat use of Atlantic humpback dolphins *Sousa teuszii* around the Río Nuñez Estuary in Guinea, West Africa. African Journal of Marine Science 373: 325-334.

Weir, C.R. and Collins, T. 2015. A review of the geographical distribution and habitat of the Atlantic humpback dolphin (*Sousa teuszii*). In Jefferson, T.A. and Curry, B.E. (eds) *Advances in Marine Biology, Vol. 72 - Humpback Dolphins (Sousa spp.): Current Status and Conservation, Part I.* Oxford: Academic Press, pp 79-118.