Final Report

Ornithological Survey in Niokolo-Koba National Park, Senegal

(August 2015 to October 2016)

Submitted to the African Bird Club

Dr. Moussa Séga DIOP, Consultant to GIE NIOKOLO and John Rose, COMETE International

September 2017
# Table of Contents

Introduction ......................................................................................................................................................... 3

1. Objectives .......................................................................................................................................................... 5

2. Methodology ...................................................................................................................................................... 6
   2.1 Training and Support Mission ....................................................................................................................... 6
   2.2 Inventories ................................................................................................................................................... 7

3. Results ............................................................................................................................................................... 10

4. Evaluation and follow-up .................................................................................................................................. 12

Acknowledgements .............................................................................................................................................. 15

5. Annexes ............................................................................................................................................................ 16
   5.1 Schedule of the Training and Support Mission ............................................................................................. 16
   5.2 List of Participants in the Training Sessions .................................................................................................. 17
   5.3 Poster presented at 14th PAOC, 16–21 October 2016 .................................................................................... 18

6. Photo Gallery ................................................................................................................................................... 19
INTRODUCTION

In the face of ever growing human pressures on biodiversity, protected areas are essential to ensure the conservation of habitats, animals and plants. Senegal is relatively rich in flora and fauna with varied ecosystems and biotopes ranging from the Sahelian to the Sudano-Guinean. In order to preserve that major biodiversity, the Government of Senegal put in place very early on a network of protected areas representing the different national ecosystems - including national parks, gazetted forests and marine reserves.

Figure 1: Localisation of Niokolo-Koba National Park

Niokolo-Koba National Park (NKNP), situated in southeast Senegal with its area of 913,000 ha (Figure 1), is the largest protected area of Senegal and one of the largest and most important nature sanctuaries in West Africa.

Report on Ornithological Survey in NKNP by M.S. Diop & J. Rose
The exceptional diversity of the Park (mammals, reptiles, birds, fish and plants) was recognized in 1981 with its designation as a Biosphere Reserve and as a World Heritage site. But since then the Park has been increasingly affected by human activities. In 2007 it was listed as a World Heritage site in danger as a result of the pressures of poaching, invasion of ponds by exotic plants, incursion of livestock and degradation of tourist infrastructures. In the framework of the integrated management of the Park, the G.I.E. (cooperative) of the guides of Niokolo-Koba (acronym: GIE NIOKOLO) is responsible for guiding visitors and supports the park personnel in various activities including monitoring and sensitisation. However, these eco-guides need support in building up their capacities. Thus in November 2012 the French association "COMETE international" launched a project of cooperation with GIE NIOKOLO. This project emphasizes training of the guides in the use of basic information technology and support for their efforts to improve their tourist services and to monitor animal and plant populations, particularly in the domain of ornithology. The ultimate object is to contribute to sustainable and participatory development of the Park by involving the surrounding populations in support of environmental preservation.

ABC provided early and strong support for this effort by granting £1,550 to GIE NIOKOLO to organise an ornithological training workshop for 11 eco-guides and 3 park rangers in June 2014 (report at https://www.africanbirdclub.org/sites/default/files/2014_Niokolo_training_English_0.pdf). Using the protocol developed in the training workshop, GIE NIOKOLO was able to begin to survey the birdlife in the Park by organising three 3-day surveys in November 2014, December 2015 and January 2015, taking advantage of the transportation provided by tourist visits to the Park and by maintenance work mandated by the Park authorities. These surveys observed a total of 153 bird species in 32 site visits.

Because it was not possible to continue the survey programme due to lack of funding to rent a vehicle and to pay the honoraria of the participating guides (who are not financially in position to donate their time to the project), the present second grant of £2,000 was requested from ABC, foreseeing the conduct of six
bimonthly inventories in the same areas starting in August 2015. It was specified that the resultant data would be made available internationally on an open access basis.

1. OBJECTIVES

The project plan foresaw that the research team (the scientific director and the three members of the GIE NIOKOLO Ornithological Commission) would computerise the results of the inventories and post them regularly on the eBird website (http://ebird.org). The sightings of raptors would be posted to the African Raptor Databank (http://www.habitatinfo.com/african-raptor-databank/). The results would be analysed, and the main statistical individual findings summarised in a joint scientific communication of the research team to be presented at the 14th Pan-African Ornithological Congress in Dakar in October 2016 and if possible published in a peer-reviewed journal. Data would be regularly shared with the Park authorities who would be invited to advise on the progress of the work.

In addition to the scientific value of the project results, a training component was included to ensure transfer of additional theoretical and methodological knowledge from the scientific director to the local research team, and from the local research team to the other eco-guides of the Park.

The following capacity-building objectives were expected to be attained at the conclusion of the project:

1. The trained eco-guides will have gained experience and recognition in high-level scientific work, and will be able to participate at a higher technical level in the regular wildlife surveys of the Directorate of National Parks and will also be available to provide technical support to external scientific research on birdlife in the Park.

2. GIE NIOKOLO will be in position to provide better support for ornithological tourism in and around the Park. This will improve the visibility and revenues of the Park, and also the lives of the local population, which will both in turn lead to more effective conservation efforts in the area.
3. It is hoped that the Directorate of National Parks will be in position to sponsor a continuing programme of birdlife surveys in the Park, drawing on the skills and experience of GIE NIOKOLO, in the same way that it conducts regular surveys of the large fauna of the Park.

2. METHODOLOGY

2.1 TRAINING AND SUPPORT MISSION

The project was initiated with a 3-day training and support mission from 8 to 10 August 2015, organised in collaboration with the Senegalese association Nature-Comunautés-Développement (NCD). Two distinct activities were conducted:

1. Ornithological inventory
   3 eco-guides of the GIE NIOKOLO Ornithological Commission were accompanied by the scientific director of the project, Dr. Moussa Séga Diop, in undertaking 6 surveys of birdlife within and immediately outside the NKNP, during which 70 species were observed (55 within the Park and 48 outside, representing respectively 548 and 414 individual birds). This activity was designed to hone the identification skills of the lead ornithology guides and to refine the list the trajectories and fixed observation sites to be surveyed during the project.

2. GPS usage in natural resources surveys
   5 eco-guides were trained by Babacar Diouf of NCD in the theory and practice of use of GPS for electronic cartography and natural resources surveys, employing the Android app OsmAnd with two Samsung entry-level smartphones which had been donated by COMETE International.

The schedule of the mission and the list of participants are presented in Annexes 1 and 2.
2.2 Inventories

For the purpose of analysis the study zone was subdivided into five sectors shown in Figure 2 (West=Ouest, Middle=Milieu, South=Sud, North=Nord and East=Est):

Figure 2: Sectors and study area (hashed)

Conforming with the rules of in the NKNP, observations were carried out while driving along the tracks, by boat on the Gambia River, and from designated observation points, as well as in the close neighbourhood of the Park. The data for this pilot project were collected at nine fixed observation sites (designated as between F01 and F18) and twelve zones (T01 to T12) of moving survey (Figure 3 and Table 1).

The sites and survey zones were mainly situated in the main tourist area in the central and northern parts of the Park (a zone of approximately 20 x 15 km) which is the richest in wildlife, and presents a rich variety of habitats: wooded savannah, riverine forest and wetlands. These parts are easily accessible in a day, making it possible to complete up to 15 site/zone visits in three days, while the peripheral areas in the south and the west of the Park are much more difficult to reach.
because of the distances to be covered, and are often inaccessible because of the condition of the tracks or impassible fords, especially during and just after the rainy season.

Eleven additional fixed observation sites visited during the moving surveys were identified late in the study; they have not been included in the statistical analysis in order to ensure consistency of the data, but will be used for future data input.
Table 1: Observation sites (fixed) and survey zones (moving)

In all, 12 inventories of between one and three days were conducted (Table 2):

- 5 inventories organised by GIE NIOKOLO with its own funding, including three preceding the present grant and two in conjunction with a group birding tour of Senegal and The Gambia organised by GIE NIOKOLO in February 2016.

- 2 inventories (August 2015 and June 2016) organised entirely with ABC funding.

- 5 inventories organised in cooperation with the Directorate of National Parks of which 4 were partially financed by the ABC funds.
Table 2: Dates, participants, and funding of the inventories

<table>
<thead>
<tr>
<th>Inventory #</th>
<th>Start date</th>
<th>End date</th>
<th>GIE NIOKOLO</th>
<th>Other observers</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16/11/2014</td>
<td>18/11/2014</td>
<td>Sitapha Souane, Lamine Diakhité, Ibrahima Kouyaté</td>
<td>John Rose</td>
<td>GIE NIOKOLO</td>
</tr>
<tr>
<td>2</td>
<td>26/12/2014</td>
<td>28/12/2014</td>
<td>Sitapha Souane, Lamine Diakhité, Ibrahima Kouyaté</td>
<td></td>
<td>GIE NIOKOLO</td>
</tr>
<tr>
<td>4</td>
<td>08/08/2015</td>
<td>10/08/2015</td>
<td>Lamine Diakhité, Banna Kanté, Sitapha Souane</td>
<td>M. Séga Diop</td>
<td>ABC</td>
</tr>
<tr>
<td>5</td>
<td>15/09/2015</td>
<td>17/09/2015</td>
<td>Sitapha Souane, Ibrahima Kanté Ansoumane Sonokho</td>
<td>Lt. Amadou Diallo</td>
<td>ABC DPN</td>
</tr>
<tr>
<td>6</td>
<td>15/10/2015</td>
<td>17/10/2015</td>
<td>Banna Kanté, Abdoulaye Kanté, Ibrahima Kouyaté</td>
<td>Lt. Amadou Diallo</td>
<td>ABC DPN</td>
</tr>
<tr>
<td>7</td>
<td>15/11/2015</td>
<td>17/11/2015</td>
<td>Abdoulaye Kanté, Ousmane Baté, Moussa Sane</td>
<td>Lt. Amadou Diallo, Lt. Lamine Diédiou</td>
<td>ABC DPN</td>
</tr>
<tr>
<td>8</td>
<td>15/12/2015</td>
<td>17/12/2015</td>
<td>Ousmane Baté, Kaly Diatta, Lassana Tacourou</td>
<td>Lt. Abdoul Ndiaye, Sgt. Chérif Sidi Ahmed Seydi</td>
<td>ABC DPN</td>
</tr>
<tr>
<td>11</td>
<td>19/02/2016</td>
<td>21/02/2016</td>
<td>Sitapha Souane, Lamine Diakhité</td>
<td>Lt. Salif Camera</td>
<td>DPN</td>
</tr>
<tr>
<td>12</td>
<td>18/06/2016</td>
<td>18/06/2016</td>
<td>Sitapha Souane, Banna Kanté, Ansoumane Sonokho</td>
<td></td>
<td>ABC</td>
</tr>
</tbody>
</table>

3. RESULTS

The project resulted in the observation of 9906 individual birds representing 185 species distributed among 70 families. The most commonly observed species were Helmeted Guineafowl (Numida meleagris) with 809 individuals, White-faced Whistling Duck (Dendrocygna viduata) with 783, Village Weaver (Ploceus
cucullatus) with 607, Long-tailed Glossy Starling (Lamprotornis caudatus) with 531 and Purple Glossy Starling (Lamprotornis purpureus) with 364. 19 species were represented by a single observed individual: Intermediate Egret (Mesophoyx intermedia), Western Reef-Heron (Egretta gularis), Martial Eagle (Polemaetus bellicosus), Booted Eagle (Hieraaetus pennatus), Eurasian Marsh-Harrier (Circus aeruginosus), Black Crane (Amaurornis flavirostra), Black-winged Stilt (Himantopus himantopus), Forbes's Plover (Charadrius forbesi), Feral Rock Pigeon (Columba livia), Shining-blue Kingfisher (Alcedo quadribrachys), European Bee-eater (Merops apiaster), Fine-spotted Woodpecker (Campethera punctuligera), Golden-tailed Woodpecker (Campethera abingoni), Fanti Sawwing (Psalidoprocne obscura), Western Olivaceous Warbler (Iduna opaca), Pale Flycatcher (Bradornis pallidus), White Wagtail (Motacilla alba), Black-faced Firefinch (Lagonosticta larvata), Pin-tailed Whydah (Vidua macroura). Two observations of sufficient rarity to be reported in the scientific literature were those of a Forbes's Plover\(^1\) and of a Shining-blue Kingfisher\(^2\).

The families most highly represented by number of observations were: Columbidae (192), Accipitridae (145), Ardeidae (98), Coraciidae (94) and Bucerotidae (89); those most highly represented by number of individuals were: Anatidae (1,116), Ploceidae (1,021), Columbidae (913), Sturnidae (900), and Numididae (809).


Report on Ornithological Survey in NKNP by M.S. Diop & J. Rose
Figures 4 to 6 show the numbers of observations and of species by geographic sector and by observation site/survey zone. The differences among the sectors would be reduced if the time spent in each sector were taken into account.

Concerning raptors, 302 individual birds were observed belonging to 192 taxons (191 species plus the "Mountain Kestrel" Falco tinnunculus rufescens) in 4 families. The species with the greatest number of birds observed were Bateleur (Terathopius ecaudatus) with 58 individuals, African Fish-eagle (Haliaeetus vocifer) with 55 and White-backed Vulture (Gyps africanus) with 34; in terms of the number of observations per taxon, the most common raptors were Bateleur with 36 observations, African Fish-eagle with 34 and Shikra (Accipiter badius) with 15. Figures 7 and 8 show respectively the numbers of observations and of species by geographic sector and the number of individuals and species observed by family.

![Figure 7: Observations and counts of raptors in the 5 sectors](image1)

4. EVALUATION AND FOLLOW-UP

It was originally proposed to conduct six bimonthly 3-day inventories with the ABC funding and the support of the Directorate of National Parks which would provide for each survey mission a vehicle with driver and a staff member to participate in the scientific team. Six inventories were indeed conducted with ABC support, although two had to be reduced in duration for administrative or financial reasons.

The survey data are available on the publicly accessible eBird and ARDB websites, and have been shared with and highly appreciated by the Park
authorities. The project results were summarised as foreseen in a poster (see Annex 3 presented at the 14th Pan-African Ornithological Congress (PAOC 14) held in Dakar on 16-21 October 2016; this also enabled the project leader for the GIE to experience a scientific conference for the first time, and to improve the visibility of the GIE for the national and international scientific communities.

The inventories almost certainly underestimated the presence of small passerines which the guides were not experienced in identifying. This has been mitigated for future work by training provided by a young French intern whose 5-month mission in 2017 was financed by the GIE and by COMETE International.

Following the termination the ABC project, the GIE conducted two additional inventories in conjunction with tourist voyages in October 2016 and January-February 2017, and starting in February 2017 a UNESCO funded a one-year "citizen science" project has foreseen 6 additional inventories with the support of NCD and the Directorate of National Parks, of which 3 had been completed at the time of writing this report. The "citizen science" project is intended to establish a sustainable, publicly accessible geographic database of the NKNP, including the collected ornithological data.

The inventories carried out by the guides and the park guards show that the NKNP hosts considerable ornithological wealth. However, it will be important to ensure regular monitoring of the observation sites and survey trajectories to enable the comparison of results with a view to analysing population trends and to contributing to determination of the status of bird species. An especially important challenge will be to inventory the thus-far excluded southern and western peripheries of the Park which are difficult and expensive to access, particularly during the rainy season (July to October).

One unforeseen bonus relative to the original ABC project was the inclusion of smartphone based GPS training, which enabled the guides to provide precise geographic data on the survey trajectories and on important observations.

Here are some appreciative comments of the participants in this training:
Ansoumane Sonokho: "The smartphone with its integrated GPS will be very useful in the framework of our guiding and ornithological survey activities. It would be appreciated if each guide could have his own smartphone."

Ousmane Baté: "The GPS tool of the smartphone has been a new discovery for us. We had only notions relative to classic GPS functions, but today we have the opportunity to have an apparatus that we can use regularly, which constitutes a considerable advantage. This will enable us to record our walking circuits [both tourist and ornithological]."

Famara Diawara: "This training has enabled us to master additional facets of portable telephones. Field surveys with GPS will permit us to easily share data with our different collaborators."

Abdoulaye Kanté: "Today there is no excuse for losing our way. With this application it becomes possible to exchange circuits with other guides. For example, a guide can record a circuit in The Gambia and share it with us. In that way we will have much less difficulty in our circuits and the distances covered will be precisely known."
ACKNOWLEDGEMENTS

The G.I.E. of the guides of Niokolo-Koba expresses its sincere gratitude to:

- African Bird Club (ABC) whose financial support permitted the organisation of this project
- COMETE International which provided advice and essential equipment (two smartphones and an entry-level spotting scope)
- Nature-Communautés-Développement which provided the GPS training
- the Warden of the Niokolo-Koba National Park and the Directorate of National Parks of Senegal for their major support in the execution of the project
- Dr. Moussa Séga Diop and Babacar Diouf for their dedicated contributions during the Training and Support mission and in its follow-up
- Dr. Oliver J.L. Fox for his continual professional advice on identification of birds and on the conduct of the project.
## 5. ANNEXES

### 5.1 Schedule of the Training and Support Mission

<table>
<thead>
<tr>
<th>Date</th>
<th>Activities</th>
<th>Details</th>
</tr>
</thead>
</table>
| 07 August  | • Travel Dakar - Dialacoto (Moussa & Babacar).  
       2015                                                                                                                                  | Overnight in Dialacoto (Campement des Amis de la Nature)                |
|            | • Moussa & Babacar meet the members of the GIE to discuss and agree on the agenda and plans for the mission.  
       | • Transfer to the GIE of the smartphone offered by COMETE International.                                                                       |                                                                        |
| 08 August  | • Journey Dar Salam - Mare de Kountadala - Hotel Simenti.  
       2015                                                                                                                                  | Surveys carried out by Sitapha, Lamine, Banna, Babacar et Moussa; overnight in Dialacoto. |
|            | • Journey Mare de Simenti - Gué de Damatan - Camp du Lion.  
       | • Journey Camp du Lion - Dar Salam - Dialacoto                                                                                                  |                                                                        |
| 09 August  | • Babacar trains 5 guides on GPS techniques using the OsmAnd smartphone app.  
       2015                                                                                                                                  | Training at the Campement des Amis de la Nature (Dialacoto); morning survey by Sitapha, Banna, Lamine et Moussa; overnight in Dialacoto. |
|            | • Journey Dar Salam - Camp du Lion - Point de vue des Hippo - Carrefour Bafoulabé - Mare de Dalafouranté.  
       | • No afternoon circuit due to a message requesting the ornithology team to leave the Park and to meet the Warden in Tambacounda.  
       | • Journey Camp du Lion - Dialacoto under intermittent heavy rain.                                                                            |                                                                        |
| 10 August  | • Second day of training on GPS by smartphone around the Campement des Amis de la Nature.  
       2015                                                                                                                                  | Banna et Ansoumane go to Tambacounda in response to the convocation of the Warden; they return with a signed authorisation to continue the surveys in the Park; overnight in Dialacoto. |
|            | • Ornithological survey outside the Park: Dialacoto - Pont Niériko - Niériko stream - Mare de Léba - Wassadou in the morning by Lamine, Sitapha & Moussa; in the afternoon, Dialacoto - Kobokoto - Bantacoly by Lamine, Sitapha, Moussa & Babacar.  
       | • Meeting for synthesis and evaluation of the mission with Babacar, Moussa and GIE members.                                                                 |                                                                        |
| 11 August  | • Departure of Babacar, Banna et Moussa from Dialacoto to Tambacounda.  
       2015                                                                                                                                  |                                                                        |
|            | • Meeting with the Warden Colonel Ousmane Kane and his deputy Major Mandian for a debrifing on the mission and its perspectives.  
       | • Return of Banna to Dialacoto  
       | • Babacar et Moussa return to Dakar.                                                                                                           |                                                                        |
### 5.2 List of Participants in the Training Sessions

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
<th>Function</th>
<th>Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ousmane Baté</td>
<td>GIE NIOKOLO</td>
<td>Responsible for ecotourism</td>
<td>Geolocalisation/smartphone</td>
</tr>
<tr>
<td>Lamine Diakité</td>
<td>GIE NIOKOLO</td>
<td>Treasurer</td>
<td>Ornithology</td>
</tr>
<tr>
<td>Famara Diawara</td>
<td>GIE NIOKOLO</td>
<td>Organisational Secretary</td>
<td>Geolocalisation/smartphone</td>
</tr>
<tr>
<td>Abdoulaye Kanté</td>
<td>GIE NIOKOLO</td>
<td>Comptroller, webmaster</td>
<td>Geolocalisation/smartphone</td>
</tr>
<tr>
<td>Banna Kanté</td>
<td>GIE NIOKOLO</td>
<td>Vice-president</td>
<td>Ornithology</td>
</tr>
<tr>
<td>Ansoumane Sanokho</td>
<td>GIE NIOKOLO</td>
<td>President</td>
<td>Geolocalisation/smartphone</td>
</tr>
<tr>
<td>Sitapha Souané</td>
<td>GIE NIOKOLO</td>
<td>General Secretary</td>
<td>Ornithology</td>
</tr>
<tr>
<td>Seydou Tandian</td>
<td>GIE NIOKOLO</td>
<td>Manager, Camp du Lion</td>
<td>Geolocalisation/smartphone</td>
</tr>
<tr>
<td>Babacar Diouf</td>
<td>NCD</td>
<td>Consultant/Formateur</td>
<td>Geolocalisation/smartphone</td>
</tr>
<tr>
<td>Moussa Séga Diop</td>
<td>AfriWet consultants</td>
<td>Consultant/Formateur</td>
<td>Ornithology</td>
</tr>
</tbody>
</table>

Report on Ornithological Survey in NKNP by M.S. Diop & J. Rose
Monitoring of Birdlife by the Guides and the Guards of Niokolo-Koba National Park, Senegal

Sibeth Souare1, Ibrahimou Kouyate1, Lamine Diakhate1, Moussa Sègà Diop1, John Rose1 & Olivier Fox2

1. Introduction Niokolo-Koba National Park is one of the most important nature sanctuaries in West Africa. Its exceptional biological (mammals, birds, reptiles, fish and plants), were recognized in 1981 with its designation by UNESCO as a Biosphere Reserve and as a World Heritage site. However, the Park is facing ever more critical anthropogenic stresses; thus in 2007 it was designated as a world heritage site in danger due to the pressures of poaching, encroachment on wetlands by invasive plants, invasion of livestock and a degradation of visitor infrastructure.

Within the framework of integrated management of the Park, the GIE (cooperative) of the guides of Niokolo-Koba organizes the guiding of visitors and supports the park personnel in different activities such as monitoring and sensitization. With the support of partners, notably the African Bird Club and the Directorate of National Parks of Senegal, the guides have received training and financial and material assistance enabling them to carry out 12 inventory missions in the Park totaling 147 hours of observation between November 2014 and June 2016. We present in the following sections the data collection methodology, the results obtained and the conclusion.

2. Methodology Conforming with the rules of in Niokolo-Koba National Park (NKNP), observations were carried out while driving along the tracks, by boat on the Gambia River, and from designated observation points, as well as in the close neighborhood of the Park. Our study zone was subdivided into five sectors (West, Middle, South, North and East), mainly situated for this pilot project in the central and northern parts of the Park. These parts are easily accessible in a day while the peripheral areas in the south and the west of the Park are much more difficult to reach because of the distances to be covered, and are often inaccessible because of the condition of the tracks or impassable forests, especially during and just after the rainy season. The data were thus collected at nine fixed observation sites (designated as between T01 and F18) and twelve zones of moving survey (T01 to T12).

3. Results The monitoring permitted the observation of 188 bird species distributed among 70 families. The data collected have already been incorporated into the eBird database. (Figures 5 et 6)

4. Conclusion The inventories carried out by the guides and the park guards show that the NKNP hosts considerable ornithological wealth. However, it will be important to ensure regular monitoring of the observation sites and survey trajectories to enable the comparison of results with a view to analysing population trends and to contributing to determination of the status of bird species.

Acknowledgments: We thank the African Bird Club for providing financial support to our project and the Directorate of National Parks of Senegal for its overall important contributions.

Presented at PAOC 14, Dakar, October 2016

Report on Ornithological Survey in NKNP by M.S. Diop & J. Rose
6. PHOTO GALLERY

Photo 1: Walking towards the Mare de Kountadala
Photo 2: Observatory of the Mare de Kountadala

Photo 3: Walking towards Gué de Damatan
Photo 4: Vérification of observed species

Photo 5: Theoretical training on the smartphone
Photo 6: A practical case with Ousmane Baté

Report on Ornithological Survey in NKNP by M.S. Diop & J. Rose
Photo 7: Recording of a trace by Abdoulaye

Photo 8: Recording of a POI by Ansou

Photo 9: Recording of a POI by Abdolaye

Photo 10: Transfer of data from smartphone to computer

Photo 11: Tandian recording a POI

Photo 12: Famara recording a POI

Photo 13: The group of guides following a circuit