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Ministry of Environment and Sustainable Development
General Board of Waters and Forests
Directorate of Fauna, Hunting and Protected Areas

GIRAFFE CENSUS IN NIGER – 2016 REPORT



October 2016

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Acronyms

AVEN	Association pour la Valorisation de l'Ecotourisme au Niger (Association for the Development of Ecotourism in Niger)
AWP	Annual Work Plan
BFH/PA	Directorate of Fauna, Hunting and Protected Areas
ND	Non Determined
NGO	Non-Governmental Organization
OC	Old Code
PAPE	Programme d'Appui aux Parcs de l'Entente (Concord Parcs Support Program)
USC	Undetermined sex of calf



Giraffe Census Team – 2016

Introduction

Niger's West African giraffe are the last of the subspecies *Giraffa camelopardalis peralta* in West Africa. Currently, these giraffe are located in the areas of Kouré and Dallol_Bosso (central zone), about 60km south-east of Niamey – Niger's capital, as well as in remote Fandou and Dingazi Banda regions located ~100km north of the central zones. Some individuals are found in the south central area of the country, particularly in the Illéla, Konni and Doutchi.

The Directorate of Fauna, Hunting and Protected Areas (BFH/PA), in collaboration with several partners, works for the conservation of this tall herbivore through the implementation of action plans and ecological monitoring of the species. In the context of giraffe population monitoring, the Directorate plans an annual census in order to study its dynamics. As with previous censuses, this year the census included the physical and/or financial participation of several partners including the Programme d'Appui aux Parcs de l'Entente (PAPE), Giraffe Conservation Foundation, Born Free Foundation, the guides association of Kouré (AVEN), the local environmental technical teams and the local community. These participations coordinated by the Directorate allowed the completion of this operation, which lead to conclusive results summarised in this document.

I. Specific objectives of the census

This activity was part of the government mandate for wildlife and habitat management assigned to the Directorate of Fauna, Hunting and Protected Areas. The targeted goal of this census was to study the dynamics and the evolutionary trend of the West African giraffe population.

II. Census operations process

The yearly giraffe census is a key part of the action plan of the Directorate of Fauna, Hunting and Protected Areas. Its implementation requires several planning phases.

2.1. Phase 1: Financial partners

The search of funds needed for the implementation of this project is mostly geared towards traditional partners supporting the Directorate to reach its conservation goals. This was done thanks to two main partnerships:

- **Programme d'Appui aux Parcs de l'Entente:** This program is supervised by the Directorate of Fauna, Hunting and Protected Areas. It included the giraffe census program in its 2016

annual action plan. This is why it was decided to fund the expenses of the State agents involved in this project;

- **Born Free Foundation:** This foundation is dedicated to wildlife conservation, such as West African giraffe. Through the Giraffe Conservation Foundation (GCF) it covered the cost of gasoline, guide support, interns, data analysis and printing of the giraffes' photo identification albums;
- **Giraffe Conservation Foundation (GCF):** This foundation provides expert and specialised support in giraffe conservation. They facilitated the support for financing of the 2016 giraffe census; and
- **Association pour la Valorisation de l'Ecotourisme au Niger (AVEN):** each year, guides participate in the data collection and analysis phases of the survey.

2.2. Phase 2: Official meeting for launching activities

After completion of the first step, the Directorate organised a meeting with its partners and staff to decide collectively the start date of field data collection activities. During this meeting the Colonel Issa Mariama Ali Omar, Director of Fauna, Hunting and Protected Areas, welcomed the participants and expressed her delight regarding the journey to get to this step. She complimented the technical and financial partners who support them to reach its conservation goals, for all the wildlife and more especially for the West African giraffe. Then, she exhorted technicians to be brave and patient for the census operation success. At the end of the meeting, she asked to make arrangements in order for the technical teams to get all the necessary material for the proceedings of field data collection.

2.3. Phase 3: Technical meetings of data collection teams

In this phase, the participants discussed technical preparation, equipment and activity practices on the field. The items broached during these meetings are summarised below:

- Instructions about the census method, to update the new census team members;
- A review of the field data collection procedure;
- A presentation and validation of census data collection sheets; and
- An inventory and a reconstitution of field work equipment.

2.4. Phase 4: Composition of census teams

Three (3) teams were created to collect data in the field. These multidisciplinary teams each included people with the following responsibilities, and each member was selected by their abilities and aptitudes regarding a specific duty:

- One (1) team leader;

- One (1) photographer (left and right sides of giraffe);
- One (1) scribe for filling the data sheets;
- Two (2) observers (one being a giraffe guide and the other an experienced person). Their role was to also identify the giraffe using the photo albums; and
- One (1) driver per team.

Throughout these meetings, all the participants were updated on the census process with clear and precise answers to their questions.

2.5. Phase 5: Field data collection

The field data collections was undertaken from mid-August through September 2016. Unlike the year before, the giraffe census activities started on time. Indeed, acquired experience in the giraffe census showed that most of the giraffe live in large groups in the Kouré, Fandou and Ouallam plateaus from July to August. Beyond this period, giraffe move in small herds in agricultural lands where their observation is very uncertain because of the challenge the teams face accessing these lands. Therefore, census teams focused the data collection on the major areas of giraffe concentration. Two main missions were performed:

- **The first mission** lasted for fifteen (15) days, from 15-30 August. The three (3) census teams were mobilised in the Kouré area (central area), where the main giraffe population is located, in order to collect as much data as possible. This area was divided into four (4) sub-areas which the three teams taking turns crossing to maximise the capture rate considering the number of giraffe individuals living there. The preferred area is wide and some giraffe do not use the central area anymore, hence a second field mission into the further areas of Fandou and Dingazi areas was needed to complete the data collection.
- **The second mission** consisted of a small team who went to the isolated areas of Dingazi Banda (Ouallam) and Fandou (Filingué) for a total of five (5) days, from 30 August to 4 September 2016 to add to the first mission's data.

It is important to highlight that the areas of Fandou and Dingazi Banda are newer habitats for giraffe who settled there a few years ago. These areas are vast and poorly mapped, thus the giraffe observations can be quite difficult with no verified information of their presence. The individuals who live there are very mobile and the team only went to areas when they had information from local informers.

III. Methodology

3.1. Census methods

The method used for field data collection was counting from 4x4 vehicles and photo-identification of each giraffe individual encountered. This method is traditionally used for the West African giraffe surveys. It allows us to index and count the majority of the population. The method was inspired from the Mark-Capture-Re-capture method.

The central area of giraffe concentration (Kouré) was divided into 4 smaller areas to facilitate data collection and prevent an overlap of the 3 teams routes, thus decreasing the “recapture rate”. During the data collection, the 3 teams covered all the selected 4 sub-areas. When a team encountered a giraffe or a herd of giraffe they would stop and begin data collection, and record:

- GPS coordinates of the location the individual was observed;
- Number of giraffe observed;
- Sex and age group of each individual;
- Type of habitat;
- Photo numbers of the 2 profiles of each individual to find the individual photos during the data analysis and create individual identity cards.

To identify the giraffe, the teams used photo-identification albums from previous years, in which all the individuals previously observed were indexed. Indeed every giraffe has its own unique spot pattern, just like human fingerprints. In particular, the calves and juveniles were always photographed because they may not have been observed in the past.

3.2. Mobilised resources for the 2016 census

The 2016 giraffe census was mobilised, for financial resources, human and equipment resources.

3.2.1. Human resources

Twenty two (22) people total, including nine (9) technicians, three (3) guides, three (3) drivers, six (6) eco-guardians (local informers) and support staff were:

- Six (6) representatives of the Directorate of Fauna, Hunting and Protected Areas;
- One (1) CSPS representative;
- Three (3) representatives of the Kouré guides association (ADEN);
- Two (2) head local forest rangers (Kouré and Fandou);
- One (1) cook;
- One (1) guard;
- Three (3) Eco-guardians;

- Three (3) drivers; and
- Two (2) interns.

3.2.2. Equipment resources

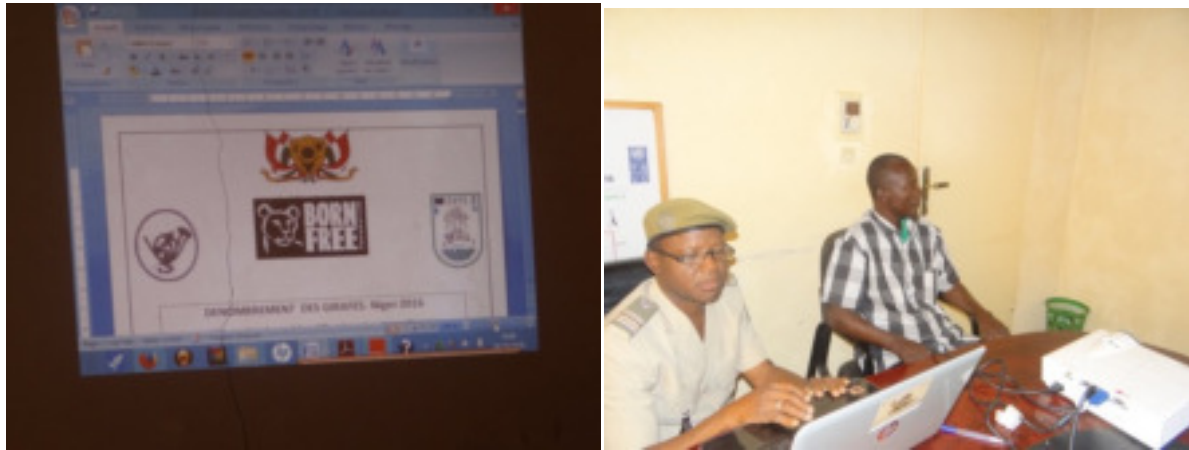
Equipment used during this census operation were:

- Three (3) 4x4 vehicles, all from the Directorate of Environment, with fuel
- Three (3) GPS devices;
- Three (3) digital cameras;
- Data collection sheets;
- Three (3) pairs of binoculars;
- Three (3) lots of giraffe identification photo albums (2012, 2013, 2014 and 2015 editions);
- Short albums of giraffe not observed during some years;
- Three (3) laptop computers;
- Batteries for GPS devices and cameras;
- Two (2) generators;
- One (1) projector;
- One (1) power stabiliser; and
- Two (2) power cords.

IV. Data collection and analysis

The data were then analysed appropriately. A pre-counting involving all the teams was initiated in the field before the main counting at the office. The analysis consisted in reviewing all the photos taken and compared to avoid duplication, which could lead to double-counting individuals and in the end, an overestimate of the population.

This activity took place in the Directorate of Fauna, Hunting and Protected Areas office and lasted about two (2) months. A tremendous amounts of insight, experience, availability and determination were required for the success of this step. During this operation, all the reports and classification errors of individuals in the wrong sex or age groups were corrected, both in the giraffe datasheets (albums) as well as in the database.



Figures 1 & 2. Data analysis at the DFC/AP

V. Census results

The results obtained during the survey are be divided in different groups – see below.

5.1. Newly observed giraffe

These giraffe had never been observed before. This category of giraffe contains adults, calves, juveniles and sub-adults that were born after the 2015 census, or not observed previously. The following table shows the numbers and distribution of the newly observed giraffe by age group and sex.

Table 1. Distribution of newly observed giraffe in 2016

Sex \ Age groups	Adults	Sub-adults	Juveniles	Calves	TOTAL
Males	0	17	4	14	35
Females	3	5	15	22	45
TOTAL	3	22	19	36	80

In total, 80 new indexed individuals, 35 males including 17 sub-adults and 45 females among which 3 adults and 6 sub-adults. The observation of adults and sub-adults proves that there are among the giraffe population some individuals that are never observed previously.

5.2. Observed indexed giraffe

The following table summarises the numbers, sex and age structure of giraffe already indexed in previous albums and observed during this census.

Table 2. Distribution of giraffe observed and previously indexed in 2016

Sex \ Age groups	Adults	Sub-adults	Juveniles	TOTAL
Males	59	14	14	87
Females	111	12	10	133
TOTAL	170	26	24	220

In total, 220 previously indexed individuals were physically observed, including 133 females and 87 males. These giraffe were inventoried in the photo albums created during previous years. All of the 135 females and the 83 males observed in 2015 were also seen in 2016. This demonstrates the capture effort and work quality of the team this year.

5.3. Total number of observed giraffe

The total number and the population composition of the West African giraffe determined with the individuals physically observed during the 2016 census campaign are summarised in the following table:

Table 3. Distribution of observed giraffes during the 2016 census

Sex \ Age groups	Adults	Sub-Adults	Juveniles	Calves	TOTAL
Previously observed males	59	14	14	0	87
Previously observed females	111	12	10	0	133
Newly observed males	0	17	4	14	35
Newly observed females	3	5	15	22	45
TOTAL	173	48	43	36	300

A total of 300 giraffe were physically observed during this census, including 80 newly observed individuals and 220 previously indexed individuals. This number represents the direct observation of giraffe indexed in past census operations and observed this year, as well as the observations of individuals observed this year for the first time (never indexed before). This number does not take into account indexed individuals that have not been observed in 2016.

5.4. Indexed but non-observed giraffe in 2016

Since the implementation of the Niger giraffe census campaign, some individuals have not been seen from one year to another.

Table 4. Distribution of giraffe indexed but not observed in 2016

Sex \ Age groups	Adults	Sub-adults	Juveniles	Calves	TOTAL
Males	74	42	51	0	167
Females	56	7	20	0	83
TOTAL					250

This year, a total of 250 indexed giraffe were not observed, against 290 in 2015. The smaller number of non-observed individuals in 2016 compared to 2015 was likely due to the fact that the census program started earlier than the previous years. It could also be explained by a longer period of time to survey the giraffes' in this census.

VI. Determination of the total giraffe population

The total estimate of the West African giraffe population was calculated by including the number of giraffes observed this year as well as the number of indexed giraffe previously (identified during past years) but not observed in 2016, and by subtracting the number of indexed giraffe known to have died. Table 5 below shows the distribution of the estimated total West African giraffe population.

This table highlights that the West African giraffes estimated for 2016 is ~547, an increase from an estimated ~499 in 2015. This corresponds to an increase of 48 individuals. This increase can be explained by a high gestation rate of adult females in 2015, resulting in increased numbers of births prior to this census. Moreover, several females (sub-adults and adults) and males (sub-adults) were indexed for the first time this year. This is likely due to the fact that around 30 calves and juveniles were observed and the mortality rate decreased.

The total estimate of the West African giraffe takes into account the indexed individuals declared dead between the end of the 2015 census and the writing of this report (October 2016).

Table 5. Total estimate of the 2016 Niger Giraffe population

Sex	Age groups				TOTAL
	Adults	Sub - adults	Juveniles	Calves	
Indexed and observed males	59	14	14	0	87
Indexed and observed females	111	12	10	0	133
Newly observed males	0	17	4	14	35
Newly observed females	3	5	15	22	45
Indexed males, non-observed during 2016 census	74	42	51	0	167
Indexed females, non-observed during 2016 census	56	7	20	0	83
TOTAL	303	97	114	36	550
Indexed giraffes, non-identified sex					3
Indexed individuals dies between 2015 & 2016 census					6
TOTAL ESTIMATE OF THE POPULATION					547

However, it is important to note that this total estimate may not be completely accurate. Indeed, the giraffe ongoing expansion to find other suitable habitats leads individuals to cross the Niger borders to other countries where they are often poached (for instance, 5 giraffe were poached in 2010 in Gao in Mali and 3 killed in Nigeria in 2010). More are likely to be poached in other places, outside of the mapped areas, where their deaths are not indexed.

As such the total population estimates that all the individuals indexed during past years and with no information about their death are still alive.

VII. Creation of the giraffe photo-identification albums

In the counting phase, the team validated the photos of all the individuals observed during the census. These photos were processed and catalogued in two Word files according to the individual's sex and sorted from smallest to greatest code. The individuals are coded by successive positive integers (1, 2, ..., n) for both sexes (male and female). Therefore, when going through the albums and when considering the individuals' codes, it would be easier to identify non-observed or dead individuals by looking at the missing numbers.

Once a Word file was finalised, it was converted to PDF. These PDFs comprise the final electronic versions of the photo-identification album of giraffe observed during the census program in 2016. This album only lists the individuals physically observed during the program.



Figures 3 & 4. Album printing

Each page of the album shows an individual with its right and left profiles, along with the following information:

- The individual code: it consists in a number followed by a dash with the year, given to each individual. It indicated the year the animal was indexed for the first time, using 2005 as a reference.
- The individual sex: it helps identify and sort the individual.
- The individual age class: it distinguishes them from other categories to help identify and sort him. Giraffe are divided into 4 age groups: (i) Adult, (ii) Sub-adult, (iii) Juvenile and (iv) Calf. The age groups are attributed according to the individual's size. The calves are between 0 and 6 months old and are up to 2m (6 feet) high. The juveniles are 6-18 months old and their size is between 2-3m (6-9 feet). The sub-adults are 2-3 years old and the adults >4 and up to ~5m tall (15 feet);
- The observations: includes all the specific information about the individual (gestation, distinguishing features, coat characteristics...);
- The name: some giraffe individuals are named after people who worked for their conservation or their development, or to remember an event linked to a person;
- The individual's birth date and its mother's code;
- The old code: it is another code, known and previously given to an individual during various census performed as part of the species monitoring.

This album is the main reference tool to monitor and estimate the West African giraffe population in 2016, and will be used for future census activities. It will be duplicated in several copies and distributed to all the partners involved in the conservation of this unique species.



Figures 5 & 6. CD-ROM burning

VIII. Giraffe reproduction

In 2016, the giraffe census allowed not only to determine a total estimate of the giraffe population, but also to observe that the population continues to reproduce well. During this census around 30 juveniles and calves were seen, born between the 2015-2016 census. Several females in advanced gestation were also observed, confirming the positive reproductive health of the population.

IX. Mortality

Every year dead giraffes are tracked and inventoried. The following table summarises all observed giraffe deaths and their causes in Niger.

Table 6. Inventory of dead giraffe between the 2015 & 2016 census

No.	Sex & age group	Individual code	Cause of death	Date	Location
1	Male adult	18/05	Trapped in a mud pit	04/03/2016	Harikanassou
2	Male calf	ND	Trapped in a mud pit	05/09/2016	Harikanassou
3	Female calf	ND	Trapped in a mud pit	06/26/2016	Kouré
4	Male adult	56/06	Poaching (by an arrow)	05/22/2016	Fakara
5	Female adult	129/09	Hacked by a machete on the rear foot	09/29/2016	Sina Koira (Kouré)
6	Male adult	ND	Natural death	10/12 /2016	Dingazi Banda



Figure 7. Poached male giraffe in the Fakara area in 2016

Six giraffe were reported dead between the 2015 and 2016 census, 3 of them previously indexed in albums. All of the dead individuals were found in the central area of Kouré and Dallol Bosso. Data collection was a result of our relationship with local partners involved in giraffe management. A dead or sick giraffe is systematically brought to the attention of competent assistance who come to assess the situation and identify the individual. These recorded deaths are not consistent with each other, and are a result of a combination of poaching and sinking in mud pits and ravines.

X. Distribution of the population

In terms of distribution, the majority of observed giraffe populations were seen in the central area, particularly in the Tiger bush plateaus and agricultural lands (areas of Kouré plateaus, intermediate area and the Dallol Bosso). Similar to the previous year, several herds numbering up to approximately thirty individuals were observed in the remote areas of Fandou and Dingazi Banda. No giraffe observations were reported in other distant areas such as Gaya, Douchi and Konni.

XI. Lessons

At the end of this 2016 census activity, the lessons learned varied and divided into several aspects:

11.1. Success of the operation organisation

The following aspects contributed to the success of this operation:

- Efficient overall organisation, as well as practical and technical management of the census activities in response to the determination and passion of the participants;
- A good knowledge of data analysis and giraffe photography techniques for the creation of the photo albums;
- The existence of a database for the last 10 census years;
- An expertise on the Niger giraffe census process and methodology;
- A pre-data analysis on the field; and
- An update of the giraffe database.

11.2. Conservation of the giraffe and its habitat

➤ **Positive aspects**

- The observation of indexed individual's unseen in 2015;
- The continuation of re-colonisation of former areas by the giraffe;
- A satisfying recapture rate thanks to an early start of the activity;
- An awareness of the central area population where the giraffe are present; and
- The tolerance of local people towards the giraffe despite the damage on the crops.

➤ **Negative aspects**

- Strong continuous degradation/deterioration of giraffe habitat caused by a proliferation of rural markets of illegal wood and the development of agricultural enclaves in the plateaus;
- High rate of indexed but non-observed giraffe;
- Strong rate of deforested areas in the plateaus and agricultural fields on the giraffe area, leading to land recovery and reforestation efforts;
- Shortfall or lack of funding for the restauration of the giraffe habitat;
- Lack of funding to support all of the villages affected by giraffe presence;
- An advanced pauperization of local populations due to a degradation of the agricultural soils and climatic hazards;
- Non-appropriation of giraffe monitoring by the Directorate of Environment in the remote areas;
- Giraffe poaching; and
- Aggravation of the damage caused by giraffe on black-eyed pea cultures.

XII. Conclusions / Recommendations

The annual West African giraffe census is a powerful monitoring tool to study the population status and dynamics of the population and its habitat. The assessment of the census activity lead to the following recommendations:

- Development of an ecological monitoring program spread throughout the year in order to obtain regular information about the level of new areas colonisation by giraffe, and to get local people more involved in the management of the giraffe and their habitat;
- Planning occasional missions to explore expanding areas and to monitor giraffe according in order to observe new individuals and their preferred habitat;
- Initiating more operations of habitat development in the Tiger bush and village zones without encroaching upon the animals' preferred areas;
- Encouraging more approaches allowing local people to get involved in conservation actions of giraffe and its habitat;
- Reinforcing support measures for the local communities;
- Creating a scientific committee for the West African giraffe;
- Designing an adapted model for an ecological database about giraffe;
- Organising anti-poaching programs in the central area to dissuade potential transgressors;
- Banning hunting permit holders from the zones to prevent them from killing young giraffe individuals outside of the monitored areas;
- Planning occasional missions year-round to raise awareness among the populations living in the remote areas
- Helping the Directorate and their remote technical teams to increase technical and material support regarding giraffe with a mandatory involvement in monitoring;
- Backing up the future giraffe census performed by cars with aerial support to more efficiently locate individuals outside the covered areas; and
- Planning to have 2 census teams in Fandou and Dingazi for a week because of the growth of the metapopulation who live in these remote areas.