



5th Quarterly Report

West African giraffe (*Giraffa camelopardalis peralta*)

Republic of Niger

August- October 2020

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This report describes the activities referring to giraffe conservation in Republic of Niger and the preliminary home range estimate for the period from 1 August to 31 October 2020.

Introduction

The last population of West African giraffe (*Giraffa camelopardalis peralta*) – recently shown to be a subspecies of the northern giraffe (Fennessy et al. 2016; Winter et al. 2018) – is only found in the Republic of Niger. Giraffe distribution is predominantly in the Kouré and North Dallol Bosso central region, about 60 km south east of the capital, Niamey, and extends to Douchi, Loga, Gaya, Fandou and Ouallam areas. Together this area is locally referred to as the "Giraffe Zone" and forms part of the Parc W Biosphere Reserve covering more than 1,700 km². A new satellite population of giraffe was established in Gadabedji Biosphere Reserve at the end of 2018 with the support of Giraffe Conservation

Foundation (GCF) and Sahara Conservation Fund (SCF). The next closest known population of giraffe is in northern Cameroon and southern Chad and are Kordofan giraffe (*G. c. antiquorum*) (Fennessy et al. 2016; Winter et al. 2018).

In November 2018 and August 2019, GCF with support from SCF and the Government of Niger, fitted 19 West African giraffe with solar powered GPS satellite units (ossi-units) to help assess their habitat use and spatial ecology over time. This Quarterly Report (Aug-Oct 2020) describes the home range (HR) size and movement patterns of the GPS tagged giraffe during this period.

During the quarter, data (hourly coordinate fixes) from 8 giraffe (females) were transmitted; however, six out of eight are stationary. Only two ossi-units transmitted the GPS positions daily, whilst the remainder worked irregularly with several day-long gaps. For the detailed information see Table 1 below.

*Table 1. An overview of GPS satellite tagged giraffe from 1 August to 31 October including ID of unit and giraffe, sex of animal, number of transmitted positions, number of days data transmitted and the ID code of giraffe. Unit marked by * is stationary.*

Unit ID	Sex	Unit fitted	Nº GPS records	Nº days	Last date of transmitted position	Giraffe ID
3038	F	November 2018	1,396	65	28.10.2020	279/15
3224	F	August 2019	2,205	92	31.10.2020	114/16
3236*	F	August 2019	328	16	25.8.2020	112/08
3238*	F	August 2019	692	30	6.9.2020	106/08
3243*	F	August 2019	1,899	85	31.10.2020	235/14
3244*	F	August 2019	43	10	24.10.2020	218/13
3245*	F	August 2019	194	9	16.10.2020	42/05
3249*	F	August 2019	1,370	58	31.10.2020	107/08

Home range

Home range (HR) of an animal is described as an area used during its normal activities of foraging, mating and caring for young. Any animal can make an “unusual” movement outside the HR resulting in outlier points which are not considered as part of its normal activity area unless observed regularly (Burt 1943). Animal tracking technology has increased the capacity of collecting data, and the methods to analyse them have evolved consequently (e.g. analytical tools for addressing autocorrelation) (Noonan 2018). The major estimator tools – Kernel Density Estimator (KDE; Worton 1989) and Minimum Convex Polygon (MCP; Hayne 1949) – are routinely used because they are relatively simple to understand, implement and comparable, but assume that the data are independent. However, they underestimate the HR size

(Fleming et al. 2015, Fleming and Calabrese 2017). As the position data are collected with short intervals (daily, hourly), they become dependent and highly autocorrelated (Noonan 2018).

Methods

For assessing the preliminary West African giraffe's HR size in Niger, the R package continuous-time movement modelling (ctmm) version 0.5.7 was used (Calabrese and Fleming 2016). The ctmm package is based on Autocorrelated KDE (AKDE). After running 95% and 50% AKDE in R studio the resulting shapefile was opened in QGIS 2.18.12 and the area calculated using the \$area function. The quarterly HR was estimated for the two giraffe separately for the period August to October 2020. The mean and standard deviation calculations were not calculated because of the unbalanced amount of transmitting units in comparison with previous months. For comparison the table from last quarters is included (Table 2).

Results

The analyses undertaken for giraffe 3038 resulted in a 563.7 km² - 95% AKDE and 91.4 km² for the core area 50% AKDE. The HR size (95% AKDE) of giraffe 3224 was estimated at 1,367.7 km² and the core area (50% AKDE) on 288.7 km².

Movement pattern

The movement patterns for the quarter was difficult to assess because of the limited number of fully functional units. The tagged giraffe 3224 and 3038 were mostly in the core area around Kouré and Kodo. During October, their movement was a little more scattered, especially giraffe 3224, who several times crossed the Dallol Boso. Table 3 indicates the stationary units with the latest transmitted position. For a detailed movement pattern of each individual see Appendix I.

Table 2 The preliminary Home Range (HR) size for first quarter (Aug-Oct 2019), second (Nov-Dec 2019, Jan 2020) third quarter (Feb-Apr 2020) and fourth (May-July 2020) of GPS satellite tagged West African giraffe in Niger. Marked values * are not included in summary statistics

	First quarter (August-October 2019)			Second quarter (Nov-Dec 2019-January 2020)			Third quarter (February -April 2020)			Fourth quarter (May-July 2020)		
ID/sex	N° of records	50% AKDE (km ²)	95% AKDE (km ²)	N° of records	50% AKDE (km ²)	95% AKDE (km ²)	N° of records	50% AKDE (km ²)	95% AKDE (km ²)	N° of records	50% AKDE (km ²)	95% AKDE (km ²)
3037 F	1,386	185.3	837.1	1,340	91.5	420.5	1,303	61.4	259.2	225	550.2*	532.7*
3038 F	54			579	15.9	97.8	295	277.3	1057.0	265	502.6*	2,131.2*
3224 F	2,023	1,762.2	9,225.2	2,114	194.8	641.5	1,950	24.6	88.6	1,829	761.2	2,876.4
3226 F	2,023	713.8	3,518.9	1,958	1,119.6	6,223.6	1,969	5,284.7*	20,282.2*			
3236 F	2,023	506.2	1,955.4	2,115	523.1	1,937.5	2,069	80.8	398.9	1,396	420.7	1,673.7
3237 F	530	55.3	335.9	485	775.8	3,028.3	108					
3238 F	2,023	39.1	175.6	2,114	1,111.2	4,998.8	2,069	113.6	437.2	1,675	612.4	2,367.1
3241 F	2,023	13,649.97*	56,438.63*	2,114	20,233.5*	80,549.3*	2,068	535.6	2,897.1	2,418	26,148.9*	115,403.9*
3243 F	2,021	641.5	2,507.1	2,182	915.4	4,031.4	1,862	160.3	638.8	265	0.0*	0.09*
3244 F	2,023	181.8	851.8	9,142	514.2	2,126.9	2,158	46.6	200.8	1,350	32.1	132.3
3245 F	2,023	27.2	125.9	2,187	162.5	826.3	1,996	111.5	558.6	263	0.0*	0.01*
3246 M	1,389	424.9	1,648.8	80								
3247 F	2,020	162.8	717.6	2,209	148.5	680.9	998	376.7	1,507.6			
3248 F	2,023	831.2	3,188.4	2,187	153.8	858.8	2,158	151.1	845.4	1,600	1,437.5	5,762.1
3249 F	2,023	621.5	2,570.0	2,187	652.3	2,937.1	2,158	48.2	184.8	2,206	167.1	620.5
3250 F	2,023	334.5	1,333.6	2,084	589.2	2,244.1						
MEAN		463.4	2,070.8		497.7	2,218.1		165.6	806.7		571.8	2,238.7
STANDARD DEVIATION		442.8	2,250.9		367.4	1,786.6		148.8	769.9		502.9	2,010.6

Table 3 Stationary GPS satellite units in Niger with the latest GPS position.

ID	Date	Latitude	Longitude	Status	Notes
3236	25.08.2020	13.2792	2.57955	Missing	
3238	06.09.2020	13.2581	2.74482	Missing	
3239	03.09.2019	13.3270	2.71276	Missing	No power issues. The unit just blips out.
3240	15.09.2019	13.2722	2.7131	Missing	Rapid decline in power. Likely the unit fell off.
3241	28.07.2020	13.5293	2.49308	Missing	
3243	31.10.2020	13.3041	2.916847	Missing	
3244	24.10.2020	13.53176	2.602841	Missing	
3245	16.09.2020	13.3079	2.68830	Missing	
3246	04.11.2019	13.3908	2.71115	Missing	Stationary clusters in a series of places in an inhabited area. Assume it fell off, was picked up by a villager and was eventually passed around between various houses.
3247	07.03.2020	13.3940	2.75745	Missing	Stationary
3249	31.10.2020	13.5005	2.49921	Missing	
3250	17.01.2020			Recovered	Unit went stationary on 17.01.2020 and was subsequently moved to another village. Unit was recovered on 29.01.2020 with sheared bolts. The giraffe was since observed in healthy condition without the ossicone unit.

Human Dimension study

From 14 to 30 July 2020, we undertook targeted human dimension surveys mission in the villages within and surrounding the Gadabedji Biosphere Reserve (BR). Our purpose was to collect individual interview data in the framework of a study on the human dimensions in West African giraffe conservation. Prior to the survey, a targeted method was developed in collaboration with local and international partners so as to ensure best approach, respect of the interviewees and where possible, comparable with survey undertaken in “Giraffe Zone” and Africa-wide.



The objective of this survey was to study the knowledge and attitudes of local people towards the West African giraffe in Niger. Additionally, we are seeking to learn about people's habits and practices, and how they use the landscape.

The team was first introduced to the traditional and administrative chiefs in the Gadebedji village and the purpose of the survey presented. As a larger pilot study in the ‘Giraffe Zone’ had already been conducted to assess the feasibility of the questionnaire, only a small pilot study was undertaken in Gadebedji village where 11 people (all men; 81.82% Tuareg and 18.18% Hausa) were randomly selected and interviewed. The interviews were conducted in the local Hausa language. All data collected was shared with the rest of the team and data analysed with partners before further interviews undertaken after minor revisions.



The next part of the survey started on the eastern side of Gadabedji BR in the village Zangon Bakoba, and then travelled around the reserve finishing on the western side in the village Zangon Gomki. The choice of the villages surrounding the reserve was random and an introduction to the chief of village was undertaken in each prior to starting.

In total, 111 people (94 men (84.7%) and 17 women (15.3%)) were interviewed in and around Gadabedji

BR. Among those interviewed, the ethnicity of the individuals was: 56 Peulhs (50.45%), 53 Touareg (47.75%) and two Hausa (1.8%).

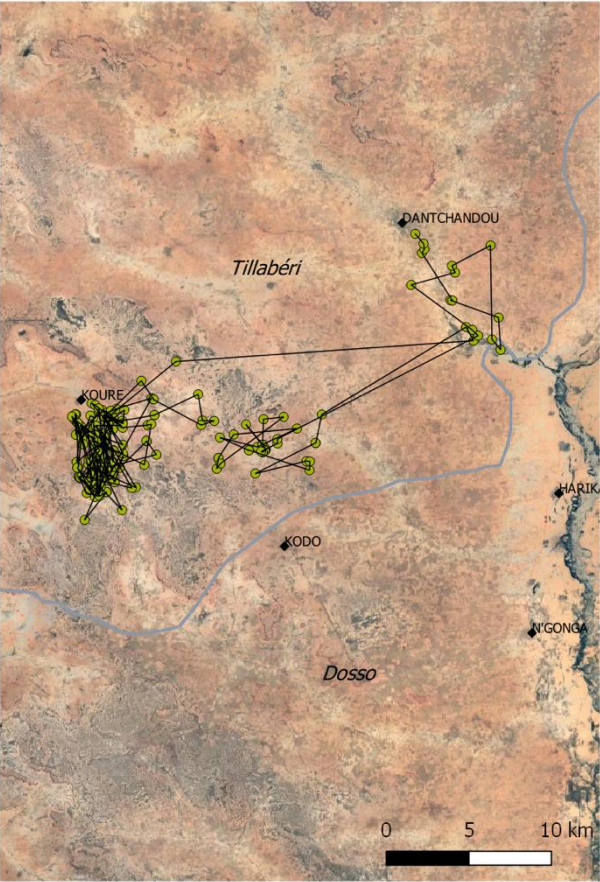
The data will be processed by Kateřina Gašparová and Abdoul Razakou Abdou Mahamadou under the supervision of Julian Blanco from University of Anger and Jenny Glikman from Instituto de Estudios Sociales Avanzados. The results will be used for master thesis of Abdoul Razakou Abdou Mahamadou and for dissertation thesis of Kateřina Gašparová. The next step is to process the raw data to descriptive statistics and combine them with ideas about the future analysis and expected results.

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APPENDIX I.-Giraffe movement pattern

3038 F



3224 F

