



## Giraffe DNA sampling Report

Botswana

January – June 2023

### Background

The Giraffe Conservation Foundation (GCF) is the only organisation in the world that concentrates solely on the conservation and management of giraffe in the wild throughout Africa. From our base in Windhoek, and several satellite offices throughout the continent, we currently work in and/or support giraffe conservation initiatives in 19 African countries through partnerships and collaborations with governments, conservation NGOs, academia, and local stakeholders.

For over 20 years we have collected tissue samples from giraffe throughout Africa for genetic analysis in support of the taxonomic assessment of giraffe. So far, we have collected more than 1,000 individual tissue samples from giraffe throughout their range in Africa. These samples are analysed by our partners at Senckenberg Biodiversity and Climate Research Centre (SBiK-F) in Germany.

Our research has clearly shown that there are four different species (and seven subspecies) of giraffe and not one as previously assumed (see Fennessy et al. 2016, Winter et al. 2018, Coimbra et al. 2021). This information is important to understand where different giraffe live and to guide and inform conservation management decision such as translocations and to determine where we should focus urgent conservation actions.

While we previously sampled giraffe in various parts of northern Botswana, we have not undertaken a detailed country-wide assessment. Based on a relatively small sample set, we determined that Botswana is home to both subspecies of the Southern giraffe with South African giraffe occurring in northern Botswana and Angolan giraffe in the central part of the country. These populations were likely historically separated by a natural 'water boundary' that has since dried up/disappeared (see Bock et al. 2014).

### Study Area

The following sites in Botswana have been identified as important sample sites to build on previous genetic research that has been undertaken in the country. These focus sites may change during the course of this project depending on changing priorities of the government, project partners, based on subsequent findings or the identification of missing key populations which still require sampling.

- Makgadikgadi - Nxai Pan National Parks
- Central Kalahari and Khutse Game Reserves
- Northern Tuli Game Reserve, Tuli Safari Areas
- Kubuyu and Sibuya Forest Reserves
- Private wildlife area including Ghanzi District, Orapa Game Park, Limpopo Lipadi Game Reserve, Mokolodi Nature Reserve.

## Objectives

1. To establish population numbers and distribution of giraffe (sub)species in Botswana.
2. To better understand the taxonomic status of giraffe (sub)species in Botswana.

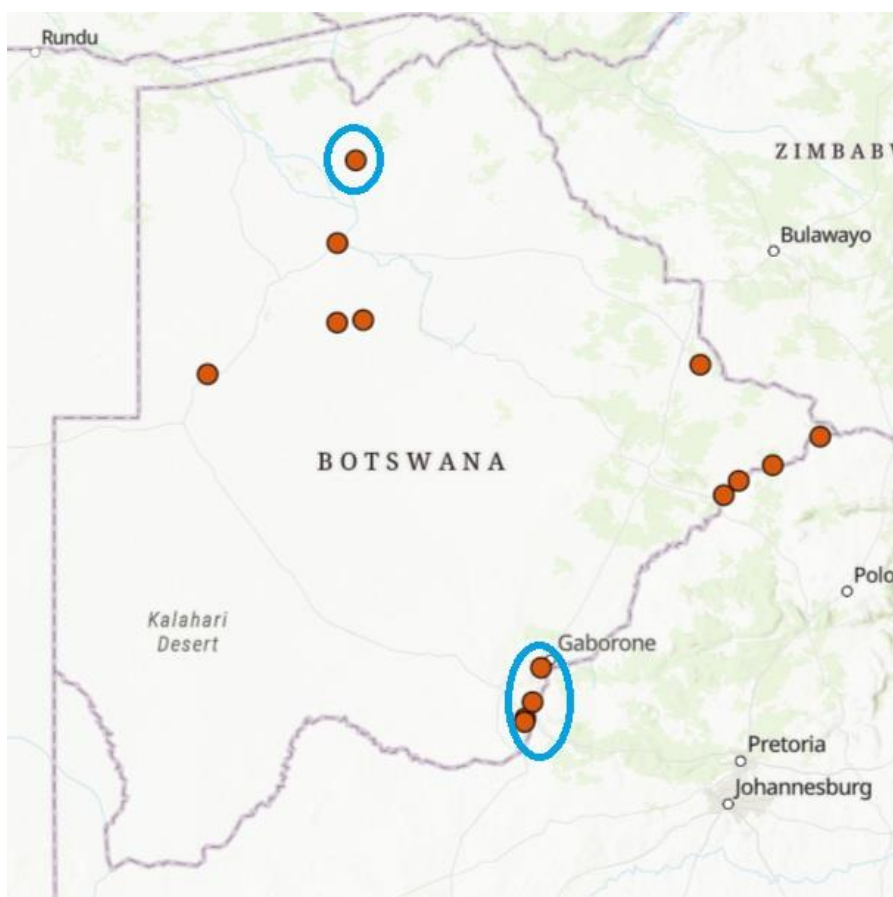
## Methods

Giraffe tissue samples were collected by a drop-dart fired from a veterinary projector (dart gun). This sampling technique does not involve any drugs or animal immobilisation. As such, the sample collection causes minimal to no stress. After collecting the fallen dart from the ground, the tissue samples are removed and placed in vials filled with ethanol. Long-term, the appropriate export and import government permits will be obtained, including CITES, to send the samples for analysis in Europe.

## Results

**Table 1:** Properties sampled in Botswana January-June 2023

PROPERTY NAME	LOCATION NAME	NUMBER OF SAMPLES	POPULATION ORIGIN
Mokolodi Nature Reserve	Southeast	4	South Africa, Ghanzi, Khutze
Phuduhudu Hunting Lodge	Southeast	2	Mokolodi, Ghanzi, Manong lodge
Thabantle Wildlife Estates	Southeast	1	Kharma Rhino Sanctuary
Khwai Private Reserve	Northeast	10	Wild



**Figure 1:** Map of all properties where DNA samples have been collected from June 2021- June 2023 in Botswana. Orange dots indicate locations and blue circled areas show recent data collection from Jan-Jun 2023.



## Updates

### Challenges

As we have continued to gather information about the parks, reserves, and smaller farms that are holding giraffe, we have found the need to request additional locations to add to our research permit. Examples included Nxai and Makgadikgadi Pan National Parks, and the Kweneng district. The request was submitted to the Ministry of Environment, Natural Resources, Conservation and Tourism in early 2023, however, it was unfortunately denied. The Ministry reasoned that we had not completed our collection from the locations listed on the current permit. We will now continue with our original sampling plan and attempt to add the additional locations when we apply for permit renewal at the end of 2023. For the renewal process we will need to justify why we did not complete collection at all locations that were included in the initial research permit as these have either been nonresponsive or rejected our requests for access to collect samples.

Due to an unforeseen medical emergency, a planned sampling trip to the Ghanzi area in July had to be postponed, however, we are attempting to reschedule this trip before the end of the year.

### DNA Samples

Since our last report we have collected 17 new samples from four locations. Three of those locations were in the Southeast district and included Mokolodi Nature Reserve which is listed on our research permit as an area of interest. We also connected with Thabantle Wildlife Estates who imported their giraffe from Kharma Rhino Sanctuary. This is of importance as Kharma Rhino Sanctuary is a key population in central Botswana holding giraffe and despite our many attempts to contact Kharma Rhino Sanctuary we have not yet been successful.

### Capacity Building

As an organisation, GCF believes that giraffe can only be saved by African people in Africa. Wherever possible we support and promote capacity building and enhancement of local Motswana in the conservation of giraffe.

At each location, the Botswana based giraffe researchers engaged with local guides and staff, as well as guests, in an effort to further spread the understanding of giraffe conservation, GCF's work and the impact of the Natural Selection Fund.

Recently we had very productive meetings with the Khwai Private Reserve and Mokolodi Nature Reserve Guides. It was encouraging to hear how much information they already have about giraffe and their conservation and to answer their additional questions. Both teams actively participated to locate and help collect DNA samples.



**Figure 2 and 3:** Khwai Private Reserve and Mokolodi Guides observing DNA sample collection and processing.





**Figure 4 & 5:** Dark bull giraffe at Mokolodi Nature Reserve; Lorentha Haraes: Conservation Manager of Mokolodi Nature Reserve removing a DNA sample from a dart.

### Timeline

Planned locations for DNA sampling during the next six months include, but are not limited to:

- Ghanzi region (to be rescheduled from July)
- Khutze Game Reserve (tentatively scheduled Oct 23)
- Jwaneng Mine (tentatively scheduled Oct 23)
- Xudum

### Acknowledgements

Special thanks go to all the participating game reserves and properties for allowing us to carry out the DNA sampling. Additionally, we thank Natural Selection Fund for financial, staff and logistical support to make this project possible.

