



Elephant utilization of the Zambezi-Chobe floodplain
Wildlife Dispersal Area, Zambia
Interim Report
January 2019



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Elephant Connection Research Project
Kavango Zambezi Transfrontier Conservation Area
Zambia

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INTERIM REPORT January 2019

a) PROJECT TITLE: Elephant utilization of the Zambezi-Chobe floodplain Wildlife Dispersal Area, Zambia

b) INTERIM REPORT

c) Principal Investigator

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d) Project Start Date: June 2018

e) Project End Date: June 2021

2) Conservation needs

Elephant movement corridors: One of the main objectives of the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA) is to establish wildlife connectivity throughout its protected landscape, yet in the face of ongoing habitat loss through illegal land clearing and logging, the Zambian component of KAZA TFCA is irreversibly losing its capacity to provide functional wildlife movement corridors. Our long-term monitoring program for elephants will seek to identify locations where conservation action is needed to secure elephant habitats, and provide information to guide conservation planning and action to secure legally protected movement corridors, which will provide lifetime benefits for wildlife. Such corridors will serve to restore landscape connectivity between protected areas within the central KAZA area to enable wildlife free movement between member countries, thereby alleviating the impacts of habitat loss, poaching and climate change on otherwise isolated wildlife populations. At least half of the estimated number of elephants in Africa occur within the KAZA TFCA and our aim is to improve connectivity between separated elephant populations. In addition, knowledge of elephant movement pathways will assist the Department of National Parks and Wildlife (DNPW) in planning their anti-poaching patrols to ensure elephant habitats are secured.

Conflict mitigation: In some areas of Africa, a direct link has been made between elephant crop damage and the levels of elephant poaching and as such, Human-Elephant Conflict (HEC) is generally considered as one of the major threats to elephant persistence in the wild. By alleviating this conflict with our *Poliwire electric fencing systems*, it is anticipated that communities will be more accepting of elephants and work together with government authorities for their long-term conservation.

3) Summary of goals and objectives

1. Determine elephant landscape utilization within the Zambian component of the Zambezi-Chobe floodplain Wildlife Dispersal Area of KAZA TFCA, through wild elephant movement data generated from GPS satellite tracking collars.
2. Conduct regular field investigations to view areas frequented by collared elephants and gather relevant data to identify factors that determine elephant movements, potential threats, and locate movement corridors.
3. Explore implementation of poliwire electric fencing systems in other regions, and provide support for the expansion of their use.

Describe any changes in goals

N/A

4) Actions taken

Objective 1. In June 2018 we commenced our study within the Zambian component of the Zambezi-Chobe floodplain Wildlife Dispersal Area (WDA) of KAZA TFCA, by fitting GPS satellite tracking collars to 2 male elephants in the southern part of the WDA. In November

2018 we fitted collars to 2 male and 3 female elephants in the northern part of the WDA (see map pg. 11).

Objective 2. Regular field investigations were conducted over the past half-year in the southern part of the Zambezi-Chobe floodplain WDA to monitor the movements and behaviour of the 2 collared male elephants and assess threats, including conflict with local farmers.

Objective 3. Contacts were made in Tanzania and Botswana to facilitate the expansion of our solar-powered poliwire electric fencing systems into other regions. A demonstration plot and a subsidy program have commenced for subsistence farmers in Botswana, however we have yet to find a cost effective means of purchasing the equipment for farmers in Tanzania.

5) Activities that differed from the original proposed actions

N/A

6) Conservation outcomes

The immediate conservation outcome we achieved this half-year was to alleviate human-elephant conflict caused by the two collared male elephants and their associates in the southern end of the Zambezi-Chobe floodplain WDA. This situation escalated rapidly and became critical to the point that the Department of National Parks and Wildlife were considering destroying an elephant due to conflict with farmers along the banks of the Zambezi River. As soon as we heard about this situation, we immediately engaged with the farmers and DNPW and provided Poliwire electric fencing systems to the affected farmers which prevented an elephant death by securing farmers vegetable produce from elephant damage.

A further outcome was the inaugural KAZA Elephant Conservation and Management Strategy workshop for the 5 partner governments in August 2018, and the subsequent KAZA Elephant Working Group workshop in October 2018 attended by elephant scientists and managers, both of which we were invited to present the collared elephant movement data collected to date by our study (see Poster pg. 12). These workshops were the first steps toward information sharing and the cooperative management of KAZAs transboundary elephants by the 5 partner countries, for which our elephant movement information will be integral for future planning and action.

Major findings and accomplishments to date:

We were successful in fitting a total of 7 GPS satellite collars this half-year to 4 male and 3 female elephants in the Zambian component of the Zambezi-Chobe floodplain WDA of KAZA TFCA. Deployment of these collars was a difficult undertaking as there are few elephants in the study area and they are widely distributed across a broad landscape, which required many hours of ground and air searching to find them. By generating movement data from elephants in both the northern and southern Zambian sections of the WDA we hope to gain an understanding of how elephants use, or attempt to use this corridor, which

from our previous ground investigations in 2016 seems to be the only recently active elephant movement corridor in the area (see map).

At the northern end of the Zambezi-Chobe floodplain WDA, five elephant satellite collars (2 males, 3 females) were successfully fitted in Mulobezi Game Management Area (GMA) of southern Kafue National Park in November 2018. Although the five Mulobezi elephants were collared in only a small 50 km² area within Mulobezi GMA and three of them from the same large herd of ~180 elephants, four groups have since moved independently from each other over large distances during December 2018, which has already provided some excellent movement data for southern Kafue NP and Game Management Areas. Information about elephant movements has been provided regularly to the DNPW Senior Warden and the Officer in Charge at Mulobezi to enhance anti-poaching strategies for increased elephant protection, and also to improve HEC mitigation responses as we move into the maize-growing season.

At Zambia's southern end of the Zambezi-Chobe floodplain WDA, the two male elephants collared in June 2018 remained at the collaring location on Sekoma and Ilombe islands in the Zambezi River for five months. The lodge on Sekoma island advised that a small number of male elephants usually spend the dry-season months on these islands, and we believe that elephants come to these islands as they find a safe refuge on this private island estate that has abundant food, water and shade during the harsh dry season. However, in prior years 5 elephants were poached nearby, which reveals the vulnerability of elephants who stay for long periods on unprotected islands. This is exacerbated by crop-raiding activity which we observed the collared elephants were undertaking with others at night after swimming off the island to the mainland early in the night, and returning to the safety of the island around 3 or 4am. Unfortunately, due to the transboundary nature of this location it is difficult to instil wildlife ownership in farmers as it is easy to label the elephant offenders as being from another country, and therefore dispensable.

The two male collared elephants finally moved away from their dry-season island refuge as the rains came in November. This area is on the boundary of 4 countries, so it is inevitable that these elephants undertake transboundary movements. They crossed the Zambezi and Chobe Rivers from Zambia, through Namibia and south into Botswana, concentrating in the Kasane and Chobe NP areas in Botswana where they have remained to date with occasional visits into Zimbabwe for brief periods, albeit no longer moving together after being inseparable for the past five months on Sekoma Island. At this stage they have not attempted to move northwards through the WDA towards Kafue NP.

Botswana is home to the majority of the elephant population in the region, which inevitably results in human-elephant conflicts as elephants move throughout the KAZA TFCA landscape. This half-year we commenced the development of a poliwire electric fencing project with Elephants Without Borders (EWB) in Botswana to expand the use of this technology into other regions. A demonstration plot was set up in a high conflict area and training was provided, and after community information meetings conducted by EWB that received a lot of interest by farmers, a list of interested farmers was compiled. One subsistence farmer at Kavimba village has already received a subsidized poliwire electric fencing system, and we are optimistic for further farmer uptake of the subsidized equipment

as the maize growing season commences. After this first-season trial of the subsidy system in Botswana, we will be able to evaluate barriers to farmer uptake and work with EWB to adjust the subsidy system accordingly.

7) Impact

Humans impacted by the project: 4 families received *Poliwire Electric fencing* systems this half year. Two DNPW scouts received financial donations towards their education and sustenance; one Scout Camp received 2nd-hand clothing donations; 3 lodge workers received a life-changing helicopter ride as our thank-you for hosting our collaring operation (see Human interest story).

Elephants impacted by the project: approximately 500 elephants are reported to reside in our Zambian study area; and ~6600 in Kafue National Park which will be connected to the larger population of approximately 220,000 in KAZA TFCA.

8) Problems during grant period

In August we experienced a theft of the majority of our field equipment and electronics which has impacted our field activities. Most of this equipment has not yet been replaced.

Signed Agreements to share data with the KAZA Elephant Working Group for the purpose of a broader circuit theory analysis of KAZA connectivity are being slowed by government processes.

9) Project success

Our short-term goal for this half-year was to commence our elephant movement study in the Zambian component of the Zambezi-Chobe floodplain WDA of KAZA TFCA and fit elephant tracking collars to gather movement data, and we are pleased to say that we have accomplished this.

The long-term goal of this study is to *identify wildlife movement corridors within the Zambian landscapes of KAZA TFCA by determining elephant landscape utilization, and identifying impediments to elephant movements and threats to their survival that restrict connectivity with cross-border elephant populations.*

Now that we have commenced our study in the Zambezi-Chobe floodplain WDA, the resulting movement data will put us well on track to achieve this long-term goal. In the southern part of the WDA we have already detected some threats to elephants, which in addition to human-elephant conflict, centre on elephant use of islands in the Zambezi River as refuges in the dry season, and their vulnerability to poaching in doing so. We will lobby for this threat to be incorporated in Action plans under the KAZA elephant strategy and KAZA elephant working group, which are currently under development.

In addition, we aim to *mitigate the impact of elephants on the livelihoods of subsistence farmers*.

In the Zambian component of the Zambezi-Chobe floodplain WDA we have provided three *Poliwire Electric fencing systems* (along with training for the farmers in how to manage their fences). In addition to protecting these farmers' vegetable gardens along the Zambezi River, these mitigation measures have also prevented the HEC-related destruction of an elephant by authorities. We have also commenced the first season of a project in Botswana to trial a subsidy system of *Poliwire Electric fencing systems* for subsistence farmers there, with the view of expanding this technology to other regions.

10) Next steps

Elephant movement corridors:

Knowledge about elephant presence within the Wildlife Dispersal Area is required to supplement the data obtained from elephant collars so that we have a broad understanding of how elephants are attempting to use the corridor. We will therefore conduct field investigations to gather elephant sighting information from communities and government authorities during the current wet season, which is the time when elephants are most likely to undertake migratory journeys. This information will be useful to target the most active areas of corridor use for further investigation and future collaring activities.

Conflict mitigation:

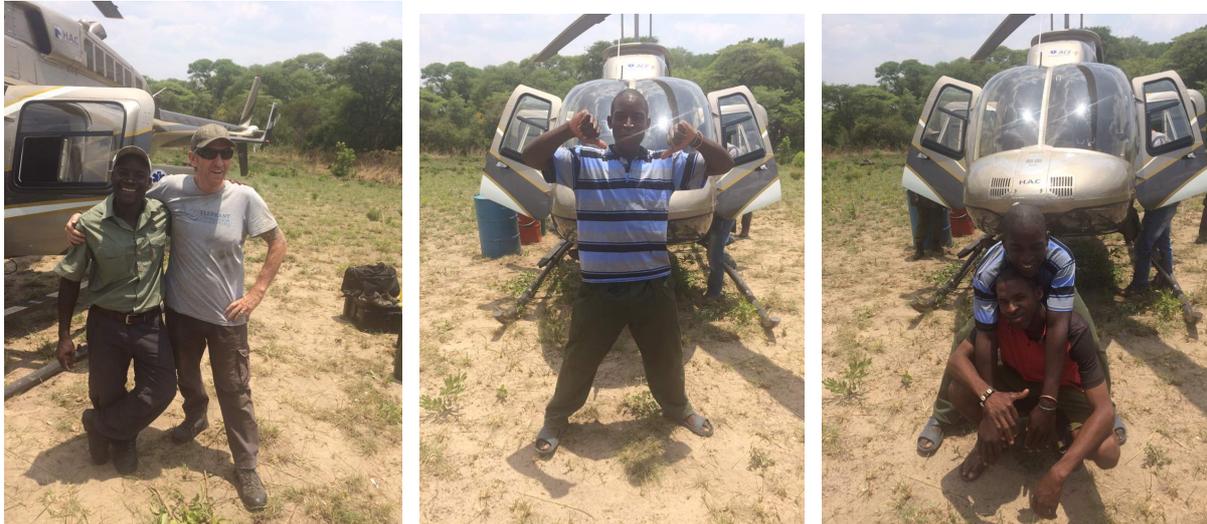
We will continue to expand our conservation footprint in Botswana through our HEC *Poliwire Electric fencing system* project with Elephants Without Borders, and review and revise the subsidy system to enable a greater number of subsistence farmers to access the technology.

11) Human interest story

During our recent elephant collaring operation in southern Kafue National Park, Zambia we were delighted to have our collaring team hosted by one of the lodges in the area which had closed for the wet season (a common occurrence in Zambia due to the difficulties of moving about on bad roads and in heavy rains and localised flooding). As the lodge had closed, there was only a skeleton team of staff that had remained to provide security and maintenance for the lodge, and this meant that they would not see their families or their village for up to 4 months until the lodge re-opened and the provision of transportation to their home was available. Despite this, the staff were so attentive and welcoming to us and our helicopter pilots and National Parks veterinarian during our stay, that we showed them our appreciation prior to our departure by treating them to a short journey in the helicopter we had hired for the collaring operation. We did not expect their level of excitement when we said we were going to take them on a helicopter ride, as they started a series of traditional bowing and clapping and you could not wipe the smile from their faces.

When they heard the helicopter returning from the last collar fitting the 4 young lodge staff sprinted to the landing pad and were standing to attention when the helicopter landed. They

were so excited you could hear them talking above the helicopter motor. After 10 minutes flight over the National Park, they returned and couldn't stop talking and high-fiving each other with huge smiles, and then showing each other the videos they took and again giving each other high-fives, and even into the next day this level of excitement continued. They said they would be the talk of their village when they showed their videos and that it had raised their status and this simple act had changed their lives - they will be forever grateful.



12) Summary

The Elephant Connection research project has commenced a transboundary elephant movement study in 2018 in the Zambezi-Chobe floodplain Wildlife Dispersal Area of the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), with the fitting of 7 elephant satellite tracking collars. This is the second Wildlife Dispersal Area for which Elephant Connection is collecting elephant movement data within the Zambian component of KAZA TFCA to investigate the connectivity between Zambian elephant populations and their cross-border cousins.

Of critical conservation concern throughout Africa is the isolation of elephant populations due to shrinking habitat, a problem that this study is designed to address. Headed by Dr Kerry Carter, the project founder and head researcher, this study is tracking movements of fifteen collared elephants to determine elephant utilization of the transboundary landscape and identify impediments to their movements and threats to their survival that restrict connectivity with cross-border populations. Together with Zambia's Department of National Parks and Wildlife (DNPW), the research seeks to identify transboundary wildlife movement corridors which, once adequately protected, can help to protect all wildlife species that use them.

The KAZA Transfrontier Conservation Area is one of the largest of its kind in the world, encompassing 520,000 km² of protected areas and communal lands in Zambia, Angola, Botswana, Namibia and Zimbabwe. KAZA TFCA, established in 2011, links some of the iconic National Parks of southern Africa such as Zambia's Kafue NP, Botswana's Chobe NP

and Okavango Delta, and Zimbabwe's Hwange NP, along with more than 30 adjacent reserves, conservancies and wildlife management areas. Transfrontier Conservation Areas can assist wildlife movements by bringing together separately managed national parks that are adjacent to political boundaries, so that wildlife can be managed under one umbrella. This provides the opportunity for suitable and safe habitat to be maintained between protected areas to enable connectivity of otherwise separated wildlife populations, which is one of the main objectives of KAZA TFCA.

However, information about functional connectivity is lacking and secure landscape linkages between many of these areas have yet to be realized. With more frequent droughts as a result of climate change reducing the amount of natural forage and water available, wildlife will need areas of safe passage to move across the landscape in search of scarce resources. Knowledge of wildlife movement pathways generated by this study will assist DNPW in planning anti-poaching patrols to ensure identified elephant habitats are secured so that dispersing elephants will not be at increased risk of poaching as they attempt to navigate routes through increasingly disturbed landscapes. In addition, when collared elephants move into farming areas, timely information provided to DNPW can assist their efforts to protect farmers crops. We were able to alleviate an escalating conflict situation by providing crop protection measures to farmers along the Zambezi River where collared elephants were feeding at night, thereby avoiding conflict-related mortalities.

13) Organisations associated with the project & their roles

- Elephant Connection. Design and implementation of all activities
- Department of National Parks and Wildlife (formerly Zambia Wildlife Authority). Project partner providing support, advice and manpower.

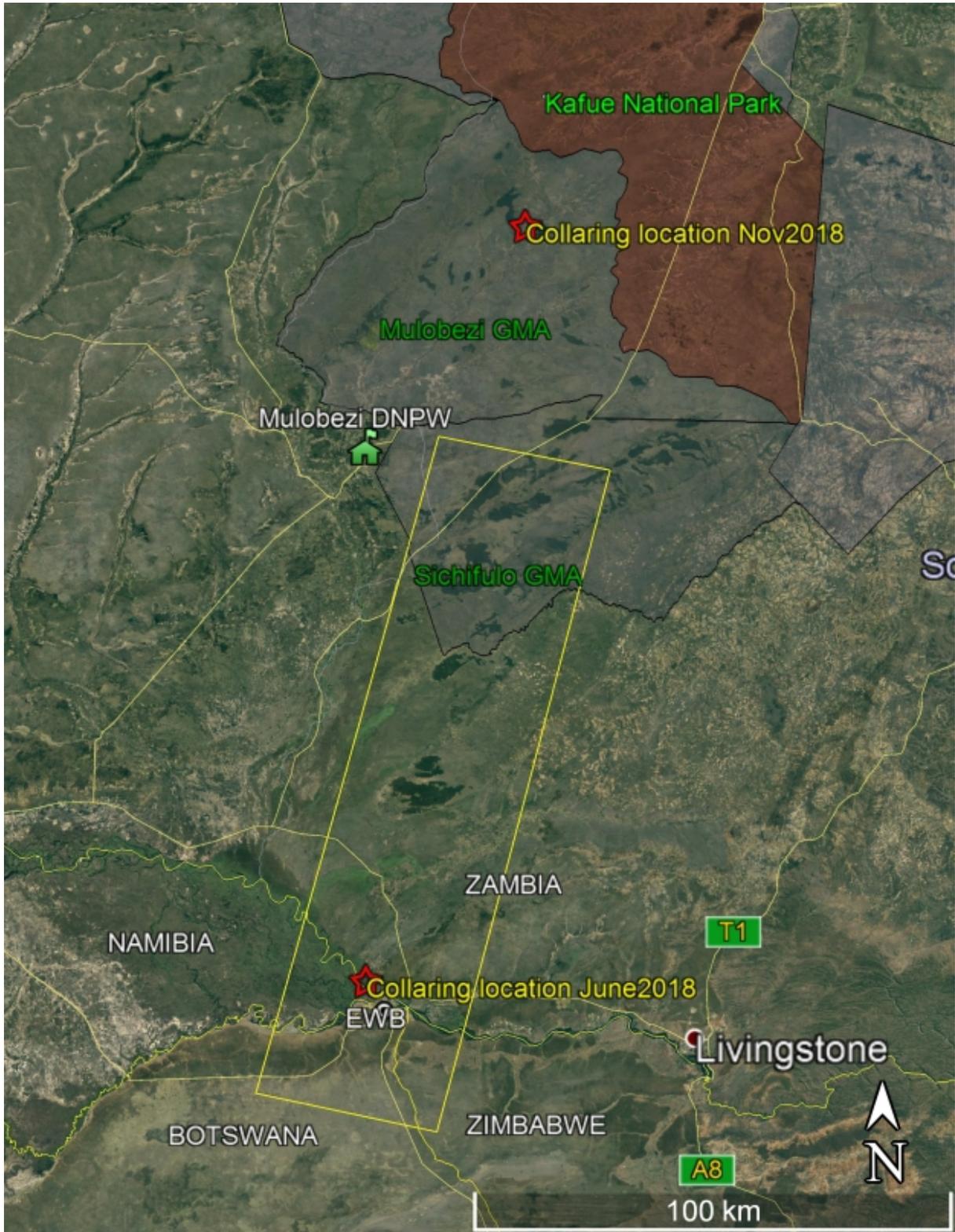
**14) Financial report of International Elephant Foundation funds spent
30th June - 31st December 2018**

Grant payment July 2018 USD 15,000

Funds Received 10Aug18 ZMW 148,380

Conversion Rate 9.892

	Budget Item	Actual Expenditure in ZMW	USD \$
	FIELD EQUIPMENT		
1.	<i>Poliwire electric fencing</i>		
	Subsidized equipment for subsistence farmers Botswana 6 x Electric fence testers @ \$90 ea	5365	542
	Poliwire electric fencing for HEC mitigation Zambia (<i>collared elephant critical conflict situation</i>)	3644	368
	CONSULTANT / HIRE FEES		
2.	Helicopter hire to fit 2 elephant satellite collars June 2018	48065	4858
	PROJECT PERSONNEL		
3.	Principal Researcher & Research Assistant		5000
	SUPPLIES		
4.	Servicing, Repairs, Insurance, Tires and Maintenance for 4wd vehicle	7573	765
5.	<i>Vehicle fuel</i> -Elephant movement corridors & elephant collaring -Conflict Mitigation	29800 2500	3012 252
6.	Office, admin & communications	7892	797
	TOTAL	USD \$	15594





Elephant herd
Lower West Zambezi GMA
(@ Sioma Ngwezi NP) Sept 2017



Monitoring of elephants and their habitats using Research UAV

Transboundary Connectivity of Elephants - South-western Zambia (KAZA TFCA)



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GOAL

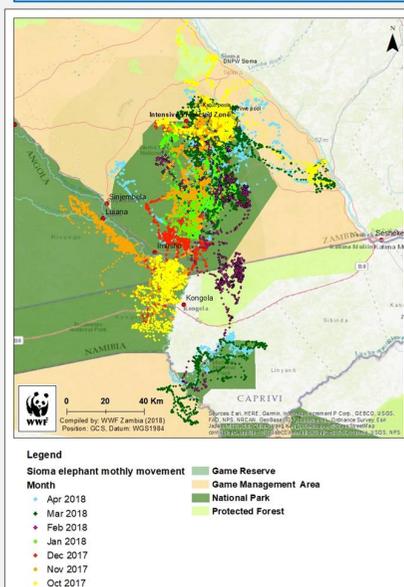
To determine elephant utilization of the landscapes within the Zambian component of KAZA TFCA, and identify impediments to their movements and threats to their survival that restrict connectivity with cross-border elephant populations

METHODS

- Fit GPS satellite collars to elephants in the Zambian component of KAZA TFCA Wildlife Dispersal Areas
- Identify the determinants of collared elephant spatial use through field investigations, including use of Research UAV (unmanned aerial vehicle)
- Timely updates to DNPW enable anti-poaching activities and human-elephant conflict action to be adapted
- In partnership with WWF:
- Analysis of elephant range and utilization of the landscape assessed using GIS analyses;
- Evaluation of the functionality of existing or proposed corridors and landscape connectivity using Circuit Theory analysis

Kwando River Wildlife Dispersal Area

Monthly movements (hourly positions) of 8 adult elephants (3♂ / 5♀) collared in 2017 in Sioma Ngwezi National Park, Zambia

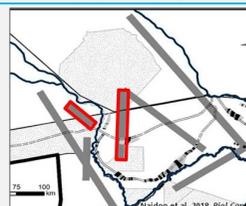


Transboundary movements

- All cross-border movements occur via southern areas of Sioma Ngwezi NP
- Notably no border crossings between Sinjembela and Imusho DNPW camps where communities exist along the river
- Reliance of elephants on cross-border access to the Kwando River in dry hot months of Oct/Nov (see yellow/orange dots)

Transboundary movement Corridors

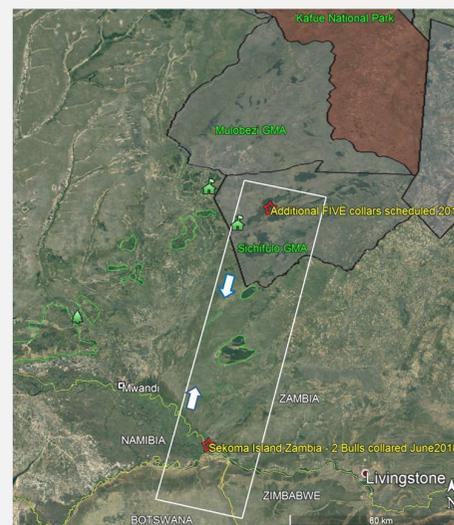
Only 2 pathways used Oct 2017-Apr 2018 (red outlines below) from those identified in KAZA TFCA Master IDP 2015 (grey rectangles)



Zambezi-Chobe floodplain Wildlife Dispersal Area

Has Kafue National Park become geographically isolated?

- Little available information about connectivity between Kafue's elephants and other populations in the region
- The most recently active corridor has the potential to provide landscape connectivity between Sichifulo GMA (southern Kafue NP) to other countries (white rectangle below)
- However no elephant reports from the centre of this corridor for the past 2 years, so may no longer be active



Long-term Implications for Isolated Populations

- Decline in genetic diversity
- Degradation of habitats
- Increased human-wildlife conflicts
- Greater impacts from climate change / droughts

Study commenced June 2018

- 2 bull elephants collared in southern section of Zambian component of WDA (Sekoma Island / Kazungula)
- **Objective:** to investigate northward movements towards Kafue NP

Next steps

- Fit GPS satellite collars to elephants in Sichifulo & Mulobezi GMAs (southern Kafue NP)
- **Objective:** to investigate southward movements of elephants from Kafue NP towards Zambezi River and identify impediments to movement

