



**Elephant utilization of the Zambezi-Chobe floodplain  
Wildlife Dispersal Area, Zambia  
Half-Yearly Report  
June 2021**



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Kavango Zambezi Transfrontier Conservation Area  
Zambia**

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

**b) Final Report**

**c) Principal Investigator**

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**d) Project Start Date:** June 2018

**e) Grant End Date:** June 2021

## 3-year Overview June 2018 - June 2021

### **Conservation needs and outcomes**

Of critical conservation concern throughout Africa is the isolation of elephant populations due to shrinking habitat. Elephants historically moved throughout much of Africa as part of an interconnected population; this enabled genetic mixing and minimised the degradation of habitats that can occur at high elephant densities. Transfrontier conservation areas (TFCA) can assist wildlife movements by bringing together separately managed national parks that are located on political boundaries, so that they can be managed as one entity. This provides the opportunity for suitable and safe habitat to be maintained between protected areas, to enable connectivity of otherwise separated wildlife populations. 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.

The Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA) in southern Africa is the world's largest TFCA, providing a vast 520,000 km<sup>2</sup> landscape across five countries for long-distance animal migrations. One of the main objectives of KAZA TFCA is to establish wildlife connectivity throughout its protected landscape, yet in the face of ongoing habitat loss the Zambian component of KAZA TFCA is losing its capacity to provide movement corridors that can enable elephants to undertake long-distance migrations between KAZA countries. The provision of corridors linking protected areas in the KAZA region will enable many of southern Africa's 300,000-strong elephant population to re-connect across fragmented habitats and function as a meta-population, as they will be able to safely move across the multiple land-use types that make up the KAZA landscape, thereby alleviating the impacts of habitat loss and climate change on otherwise isolated wildlife populations. Our research contributes to the KAZA-wide assessment of elephant connectivity and elephant corridor needs, which will be influential in designating wildlife movement corridors for protection by the five partner countries to improve elephant management throughout KAZA TFCA.

Our project aims to identify transboundary elephant movement corridors and connectivity through knowledge of elephant movements gained from fitting satellite tracking collars in Zambia, combined with field-verified elephant sightings in locations where collar data is not yet being generated. The data we have collected has provided an understanding of corridors connecting Zambia's protected areas to central KAZA TFCA and has captured long distance migratory behaviour of Zambia's elephants. We were also able to provide long awaited evidence of elephant movements between two of Zambia's national Parks in the KAZA TFCA – Sioma Ngwezi NP and Kafue NP, thereby evidencing that Kafue NP still has landscape connectivity with other parts of KAZA TFCA. We also now understand the seasonal range of elephants in the Zambian component of KAZA TFCA and areas that are important to protect in the dry season when elephants are tied to specific water resources. We have been able to shine the spotlight on the return of elephants to the Zambian component of KAZA TFCA (from other countries), which would otherwise have gone unnoticed. This is an extremely positive change as it highlights the prospect for elephants from high density populations such as Chobe NP, to move into areas that have sufficient resources but lower elephant population densities such as Kafue NP. Prior to our research there were no documented elephant movements for

much of this landscape and what we have been able to discover will inform elephant management decisions well into the future. Our research has also enabled us to document frequent cross-border exploratory behaviours by elephants from Namibia, Botswana and Zimbabwe into Zambia, and use this information to identify and assist rural farmers that are impacted by elephant crop-raiding. Efforts to reduce elephant crop raiding in these transboundary areas is vital to facilitate coexistence between people and elephants, so that communities support efforts to re-establish traditional elephant movement pathways across country borders. As such, we have identified a number of important transboundary crossing points in which to conduct HEC mitigation activities to address some of the threats to elephants as they undergo transboundary movements.

We have achieved conservation outcomes for elephants and subsistence farmers by mitigating conflicts, both through providing information to Zambia's Department of National Parks & Wildlife (DNPW) to manage crop-raiding events and also through direct interventions by providing our solar-powered poliwire electric fencing systems to subsistence farmers affected by elephant crop raiding, benefiting more than 300 people and securing harvests for the food programs of two schools. Our intervention with HEC mitigation also prevented an elephant death when a crop-raiding situation became critical to the point that the Department of National Parks and Wildlife were considering destroying the elephant.

## **Goals**

The 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.*

In addition, we aim to *mitigate the impact of elephants on the livelihoods of subsistence farmers*, which we have continued to do by assisting more farmers to deter elephants from entering their fields and raiding their produce.

## **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.

## **Actions taken:**

### **Objective 1**

During the 3-year grant period we successfully fitted 18 elephants with satellite tracking collars throughout the Zambian component of the Zambezi-Chobe floodplain Wildlife Dispersal Area (10 in the northern section and 8 in the southern section along the Zambezi River). These

elephant satellite collars have successfully documented elephant movements, transboundary crossing locations and areas of potential human-elephant conflict.

#### Objective 2

-Conducted field investigations where the collared elephants travelled, with human-elephant conflict sites identified and mitigated to reduce threats to elephants.

-Gathered elephant sightings information from communities and government authorities.

-Verified and mapped new sightings of elephants and their transboundary crossing points as they moved into Zambia from other KAZA TFCA countries. This enabled us to document frequent cross-border exploratory behaviours by elephants from Namibia, Botswana and Zimbabwe.

#### Objective 3

Contacts were made in Tanzania and Botswana to facilitate the expansion of our solar-powered poliwire electric fencing systems into other regions. We successfully transferred the use of poliwire electric fencing technology to Botswana farmers by providing training, equipment and support to Botswana partners.

### **Overall successes and failures**

*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.*

Since 2017, we have deployed a total of 31 elephant satellite tracking collars in targeted locations to investigate elephant movements and connectivity across the Zambian component of KAZA TFCA. The collars were very widely distributed and have provided good coverage of the landscape, and we are proud of this as it was a difficult undertaking due to the small and sparsely distributed number of elephants in our study area.

The movement data generated by these collars combined with field-verified elephant sightings in locations where collar data is absent, have provided a huge amount of information relating to elephant movements, pathways/routes used, transboundary crossing points, seasonal ranges, interaction with farmers, and areas that elephants avoid. All of this information has filled a huge gap in knowledge for the Zambian landscape. For the Zambezi-Chobe floodplain Wildlife Dispersal Area of KAZA TFCA we have been able to document that one of the main restrictions to connectivity is that elephants are reluctant to move southwards out of Kafue NP due to threat of poaching, which is no doubt a deterrent for elephant movements towards the Zambezi River and central KAZA.

We have made some progress in identifying and securing KAZA TFCA elephant movement corridors, however by 2021 we are not as progressed as we had envisaged. Some of the steps towards this goal that we have been involved in are as follows:

- assisted the development and drafting of Zambia's current Strategic Elephant Conservation and Management Plan to include one of the main targets as obtaining formal protection of elephant corridors under Zambian law
- founding members of the KAZA Elephant Working Group

- development of a Strategic Planning Framework for the Conservation and Management of Elephants in KAZA TFCA
- development of the concept for a collaborative corridor/connectivity analysis aimed at formally recognizing important elephant corridors for protection across KAZA TFCA. We submitted elephant movement data from our satellite collars for this purpose
- collaborative GIS mapping of elephant movement data
- draft collaborative analyses of KAZA TFCA landscape connectivity for elephants

Hindrances to this progression have been the slow processes within the KAZA structures for initial endorsement of the Elephant Working Group as an official KAZA Group, which in turn delayed approvals from governments to share elephant movement data, which essentially stalled the development of outputs from the Elephant Working Group.

### *Mitigate the impact of elephants on the livelihoods of subsistence farmers*

Our solar-powered poliwire electric fencing systems have been very effective at stopping elephant crop-raiding wherever we have installed them. We have improved food security of subsistence farmers and secured their livelihoods by encircling fields and vegetable gardens with the single-strand Poliwire electric fencing system, which is a simple low-maintenance system that we have designed particularly for use by subsistence farmers.

We have been able to introduce poliwire electric fencing systems for farmers in Botswana, however we have been unable to introduce into other regions as we have yet to find a cost effective means of purchasing the equipment for farmers in other countries.

### **Measures of impact**

#### Humans impacted by the project:

In Zambia, 35 rural farming families have so far benefited from Poliwire Electric fencing systems for HEC mitigation on their subsistence farms (securing food sources for 214 people: 41 men / 38 women / 135 children), plus one agricultural garden at a school of 800 students (orphans/vulnerable children).

In Botswana, our collaboration with Elephants Without Borders has also been successful to assist subsistence farmers there. Poliwire Electric fencing systems for HEC mitigation have now been distributed to 20+ farms around Kasane, Chobe Enclave and Ngamiland (more than 100 people assisted) and also a school agricultural garden at a school of 1000+ students in Kasane. Poliwire Electric fencing has been working well to reduce crop-raiding, and Elephants Without Borders advise that they plan to continue with it as part of their HEC toolkit in the future.

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 (at least half of the estimated number of elephants in Africa).





## Half-yearly Report January - June 2021

### **Conservation outcomes**

We have shown through the data generated by our elephant satellite collars that Kafue National Park connectivity to other protected areas is evident, based on long-distance movements we have seen from our small sample of collared elephants. Four male elephants that have undertaken extensive return journeys from Zambezi River locations northwards to Kafue NP over the past few years represent 13% of the total elephants we have collared and 20% of collared males. Although this percentage cannot be extrapolated to the entire population, it does raise the intriguing question of what proportion of the male population are undertaking such journeys, which are often undertaken at the onset of the wet season.

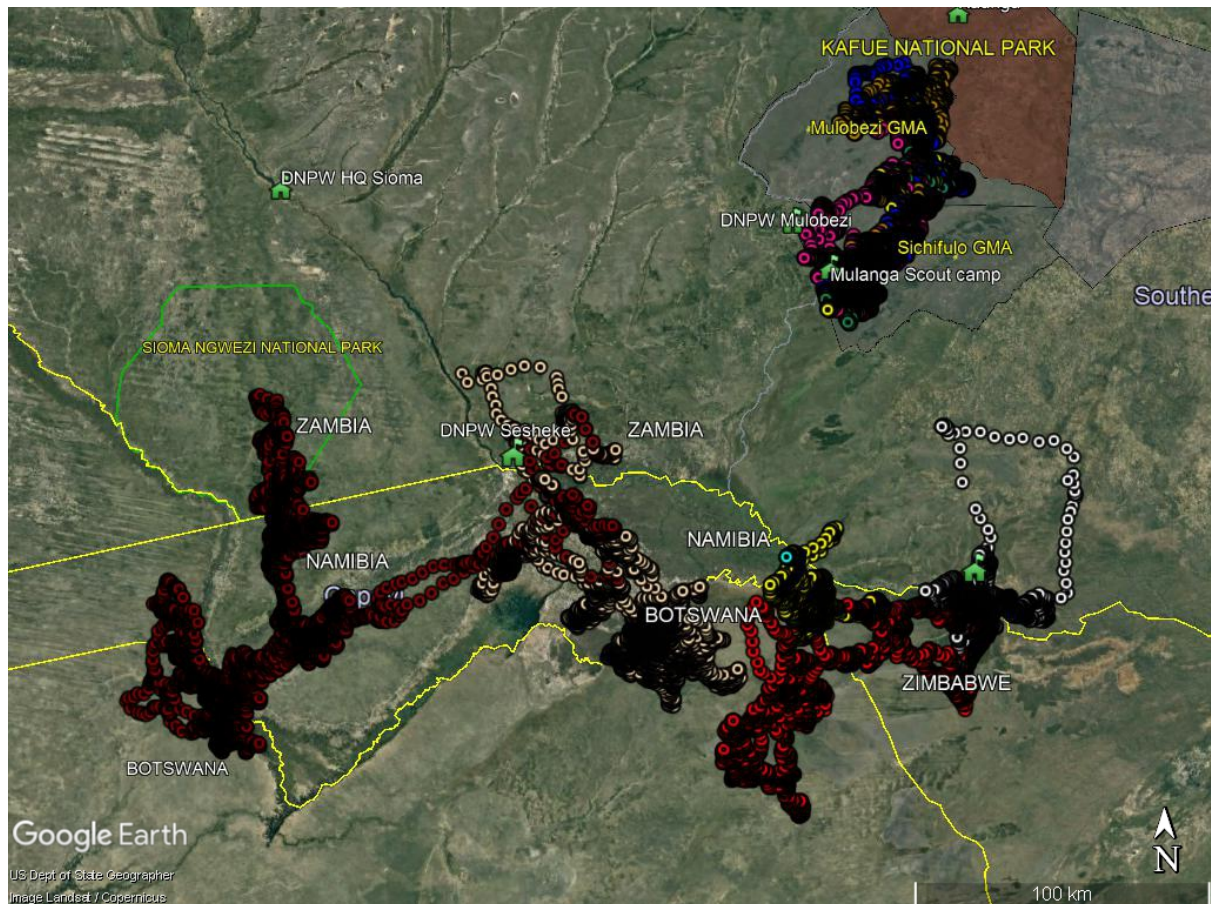
Previously such elephant movements were undocumented in the Zambian component of KAZA TFCA but now the paths that these elephants have taken will be able to provide a baseline for connectivity for which land use planning can be built around.

We also continued to foster human-elephant coexistence by assisting a further 18 rural families to secure their produce against crop-raiding by elephants during this half-year.

### Major findings and accomplishments to date:

#### **Elephant movement corridors:**

The new elephant collars fitted at the end of 2020 have already produced valuable information this half year about transboundary crossing areas and connectivity between different landscapes within KAZA TFCA. Notably, we have seen movement northwards from the Zambezi River (Zambia/Zimbabwe) towards Kafue NP (white circles to the right of map below), which provides information about a fourth potential connectivity pathway between Kafue NP and central KAZA. The other three we have previously recorded have originated from Sioma-Ngwezi NP which is located to the southwest of Kafue NP. The large Zambezi River appears to provide little resistance to male elephants undergoing exploratory behaviour around the KAZA landscape, which reveals an exciting prospect for elephant connectivity between protected areas in Zambia and other areas of KAZA TFCA.



### Conflict mitigation:

This half year we have helped additional farmers with solar-powered poliwire electric fencing systems to deter elephants from entering their property at the Mambova elephant corridor adjacent to Sekoma Island where we have been monitoring elephant movements over the past few years. Here, increasing numbers of elephants moving into this area are threatening people's food security during the dry season when they grow their vegetable produce gardens along the Zambezi River, both for household consumption and in good years also for additional income. Working closely with the local office of the Department of National Parks and Wildlife, we conducted farm inspections for farmers requesting assistance, and provided poliwire electric fences that encircled and protected multiple vegetable gardens within one fence (cluster farming). In this way, we were able to help 18 families.

### Impact

Humans impacted by the project:

This half year a further 18 rural farming families received Poliwire Electric fencing systems for HEC mitigation on their subsistence farms (securing food sources for 113 people: 20 men / 19 women / 74 children).

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.



## **Problems during grant period**

This half year, 3 of the elephant tracking collars have failed therefore reliability with the collars supplied by Africa Wildlife Tracking has become an issue. Not only does this impact data collection, it also introduces additional costs in searching for elephants so that the faulty collars can be located for removal.

Major vehicle maintenance work was required as a result of the continued deterioration of roads in the study area.

## **Project success**

The 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.*

We have collected further data this half-year regarding transboundary crossing points into Zambia and movement of elephants northward towards Kafue National Park. As per the map above recent elephant movements have highlighted a number of areas where elephants move across borders and which require further monitoring and protection to ensure this connectivity between countries is not disrupted.

In addition, we aim to *mitigate the impact of elephants on the livelihoods of subsistence farmers*, which we have continued to do by assisting more farmers to deter elephants from entering their fields and raiding their produce.

## **Next steps**

We have evidenced that the number of elephants moving across the Zambezi River into Zambia from other countries during the dry season is increasing, and will no doubt impact more rural farmers as they cultivate their dry-season vegetable plots. We will combine the movement data from our elephant tracking collars with verified elephant sightings from community members to continue to monitor the impact of elephants on rural livelihoods along 250 km of the Zambezi River. We will develop our team to assist with this monitoring and support farmers who are being impacted by increased elephant numbers during the dry season.

## **Human interest story**

Need a recycling project? .....try this! This truck model is a Zambian special from the southern province, built from recycled wire, tin cans and even a used corn cob! This young fellow was very proud to show off his machine, made by his uncle in a neighbouring village. This type of toy provides a good initiation into bush engineering through its needed repairs and improvements over its lifetime, and no doubt makes sure the innovative skills of rural communities continue on to the next generation! With the daily struggle just to make sure there is food on the table, it's heartening to see that kids can still be a loving focus for fathers and uncles as they take the time to create toys and interact with their young men.







**Financial report of International Elephant Foundation funds spent**  
**1<sup>st</sup> January – 30<sup>th</sup> June 2021**

**Grant payment January 2021** USD 17,000 (less **-\$2,896** c/fwd from Dec report) = \$14,104

**Funds Received 2Mar2021** ZMW 368,107.80  
**Conversion Rate** 21.6534

	Budget Item	Actual Expenditure in ZMW	USD \$
	EQUIPMENT		
	Poliwire electric fencing systems	44,513	<b>2,056</b>
	Elephant satellite tracking collar (incl. freight & 2 yrs data fee)		-
	CONSULTANT / HIRE FEES		
2.	Helicopter hire to remove 2 elephant satellite tracking collars and fit one new collar		-
	PROJECT PERSONNEL		
3.	Principal Researcher & Research Assistant		<b>5,000</b>
	SUPPLIES		
4.	Servicing, Repairs, Insurance, Tires and Maintenance for 4wd vehicle	100,215	<b>4,628</b>
5.	<b>Vehicle fuel</b> -Elephant movement corridors -Conflict Mitigation	19,108 1,715	<b>882 79</b>
6.	Office, admin & communications	31,614	<b>1,460</b>
	<b>TOTAL</b>	<b>USD \$</b>	<b>14,105</b>

**Organisations associated with the project & their roles**

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