Biodiversity Challenge Funds Projects
Darwin Initiative, Illegal Wildlife Trade Challenge Fund, and Darwin Plus

Half Year Report

It is expected that this report will be a **maximum of 2-3 pages** in length.

If there is any confidential information within the report that you do not wish to be shared on our website, please ensure you clearly highlight this.

Submission Deadline: 31st October 2024

Please note all projects that were active before 1 October 2024 are required to complete a Half Year Report.

Submit to: BCF-Reports@niras.com including your project ref in the subject line.

Project reference	30-028
Project title	Promoting connectivity to create Living Landscapes in southern Mozambique
Country(ies)/territory(ies)	eSwatini (Kingdom of), Mozambique, South Africa, Zimbabwe
Lead Organisation	Drs. Carlos Lopes Pereira and Joao Almeida President and Vice-President of the Mozambique Wildlife Alliance (MWA)
Partner(s)	Elephants Alive, Elephant Crisis Fund, PAMS Foundation, Sensing Clues, For Elephants
Project leader	*Antonio Alverca; Mozambique Wildlife Alliance*
Report date and number (e.g. HYR1)	*HYR2*
Project website/blog/social media	*Regular updates via Elephants Alive social media page: https://elephantsalive.org/ and https://www.mwa.co.mz/*

1. Outline progress over the last 6 months (April – September) against the agreed project implementation timetable (if your project started less than 6 months ago, please report on the period since start up to end of September).

We have collated all M&E resources within the attached document (HYR2 M&E). This document details our project outcome (tab 1), BCF log frame which includes alignment with the BCF Standard Indicators (tab 2). For the Standard indicators alignment process, we would value any feedback for appropriateness to report against the five suggested core indicators that we selected to help inform this standardisation process. At this stage, we confirm that our indicators are still relevant for this project and will continue to monitor against these. We confirm that we are working on the most up to date log frame for our M&E process.

Please note that we acknowledge reviewer feedback that reporting for project outputs level measurable indicators is required for the annual report and will align with that in the next annual report. For consistency with our previous half year report, we have shown project progress at activity level.

During the following section, we demonstrate our detailed narrative report progress on all activities to support our monitoring progress (which is reflected in the aforementioned tab 2):

Activities:

1.1 Collar 15, 10 and 5 elephants in strategic locations in compliance with animal ethics from Year 1-3, respectively (cooler months for elephant safety)
The Mozambique Wildlife Alliance (MWA) deployed 8 collars by the end of Year 1, and to date 12 elephants have been collared in Year 2 of the project. As aforementioned in our previous report, we have set a baseline of collaring 10 elephants per year in order to collectively collar the representative total of 30 elephants throughout the lifetime of the project (2023-2026) and to factor in unforeseen logistical challenges such as resources limitations (i.e. helicopter time). We will therefore still achieve the upper tolerance of collaring 30 elephants throughout the timeline of the project.
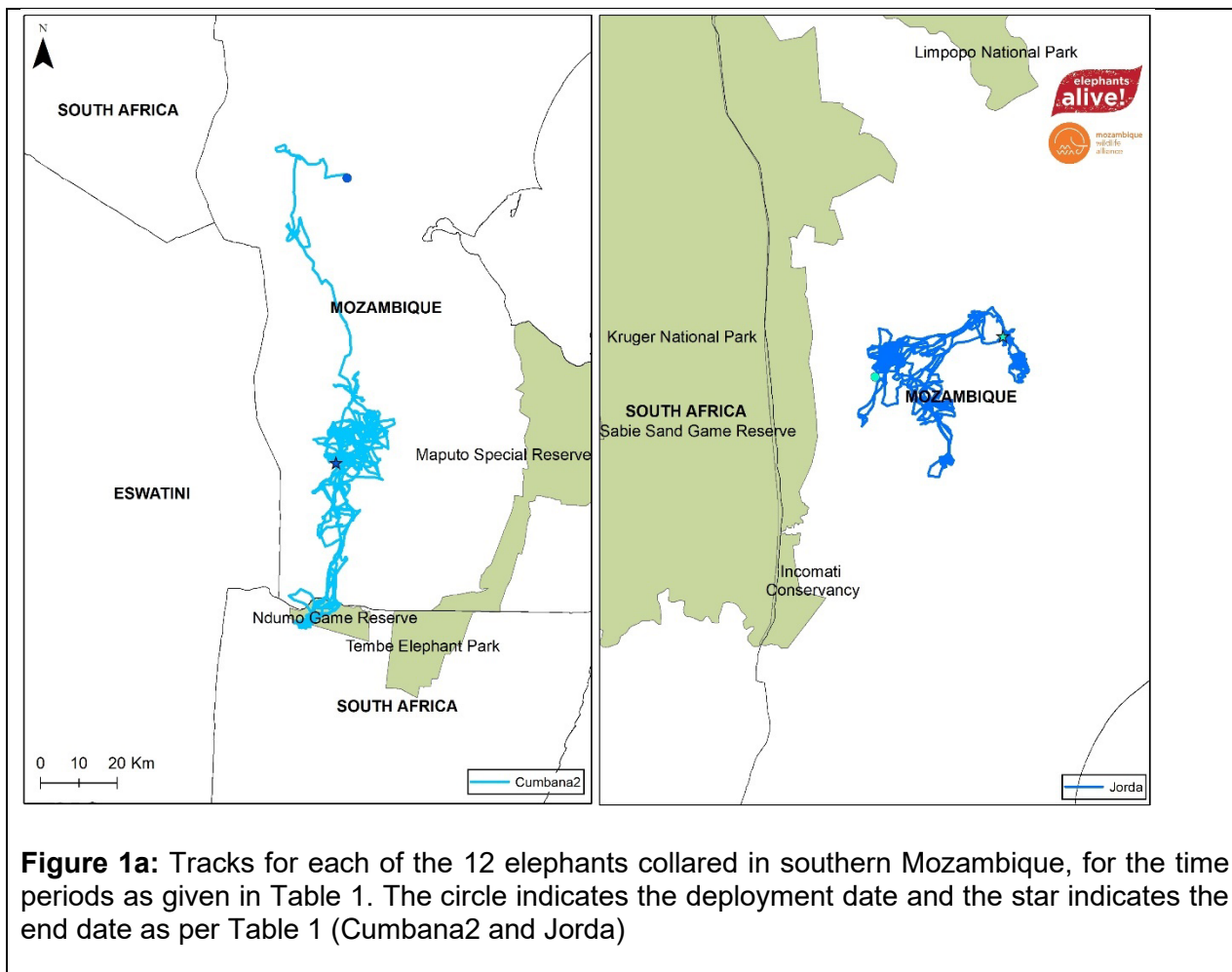
1.2 Spatial analysis of elephant movements through remote sensing/GIS, and field-based data collection in Year 1-3

Elephant tracks

Twelve elephants were collared in the first half of this reporting period (Table 1, Figures 1a-d). The first two elephants collared (Cumbana2 and Jorda) made up for the two that were outstanding in year 1. The remaining 10 that were collared make up the total required for year 2.

Table 1: Deployment date, end date (final day of this reporting period), the GPS logging rate, as well as number of GPS points logged and total distance travelled within the given time-period, for the 12 elephants collared in southern Mozambique in year 2.

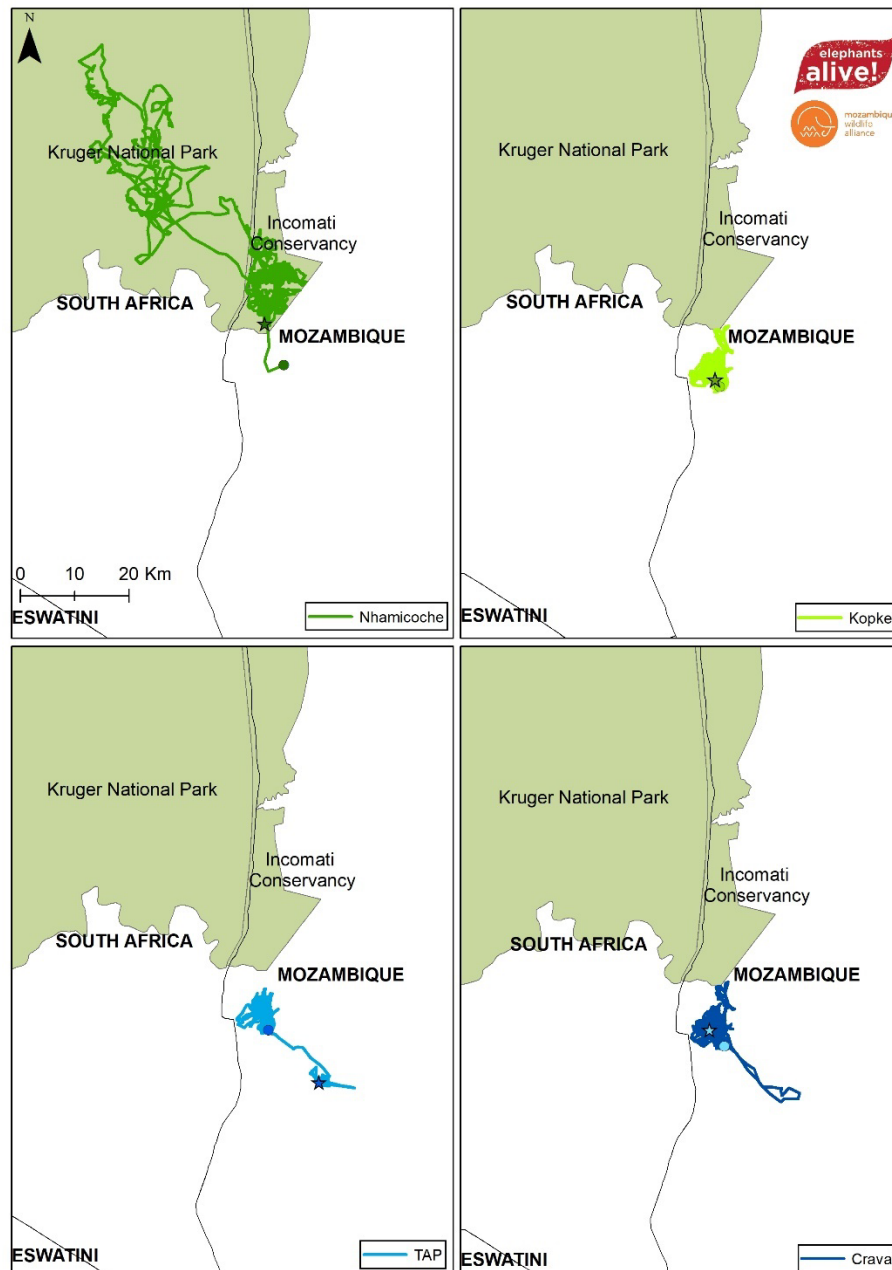| Elephant name	Sex	Deployment date	End date	GPS log rate (hr)	Number of GPS points	Distance travelled (km)
Cumbana2	Male	2024/04/19	2024/09/30	1	3 130	1 656
Jorda	Male	2024/05/16	2024/09/30	1	3 284	1 289
Nhamicoche	Male	2024/05/17	2024/09/30	1	3 257	1 088
Kopke	Male	2024/06/06	2024/09/30	1	2 779	757
TAP	Female	2024/06/06	2024/09/30	1	2 779	685
Cravat	Male	2024/07/18	2024/09/30	1	1 781	552
Ricardo	Male	2024/07/25	2024/09/30	1	1 611	371
Cipriano	Male	2024/09/26	2024/09/30	1	112	48
Georg	Male	2024/09/26	2024/09/30	1	111	47
Saseka	Male	2024/09/27	2024/09/30	1	90	33
Vutomi	Male	2024/09/27	2024/09/30	1	88	38
Tintswalo	Male	2024/09/27	2024/09/30	1	87	25

Figure 1a: Tracks for each of the 12 elephants collared in southern Mozambique, for the time periods as given in Table 1. The circle indicates the deployment date and the star indicates the end date as per Table 1 (Cumbana2 and Jorda)

Figure 1b: Tracks for each of the 12 elephants collared in southern Mozambique, for the time periods as given in Table 1. The circle indicates the deployment date and the star indicates the end date as per Table 1 (Nhamicoche, Kopke, TAP and Cravat)
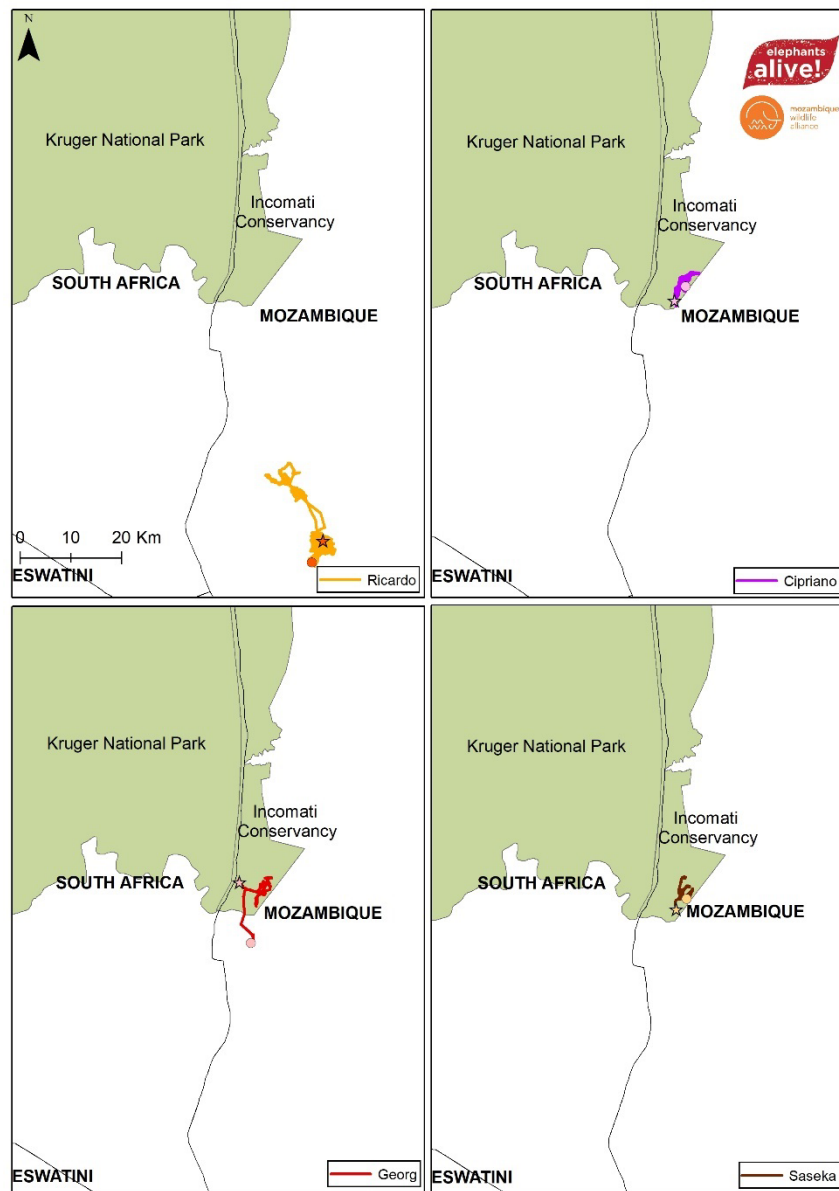
Figure 1c: Tracks for each of the 12 elephants collared in southern Mozambique, for the time periods as given in Table 1. The circle indicates the deployment date and the star indicates the end date as per Table 1 (Ricardo, Cipriano, Georg and Saseka)
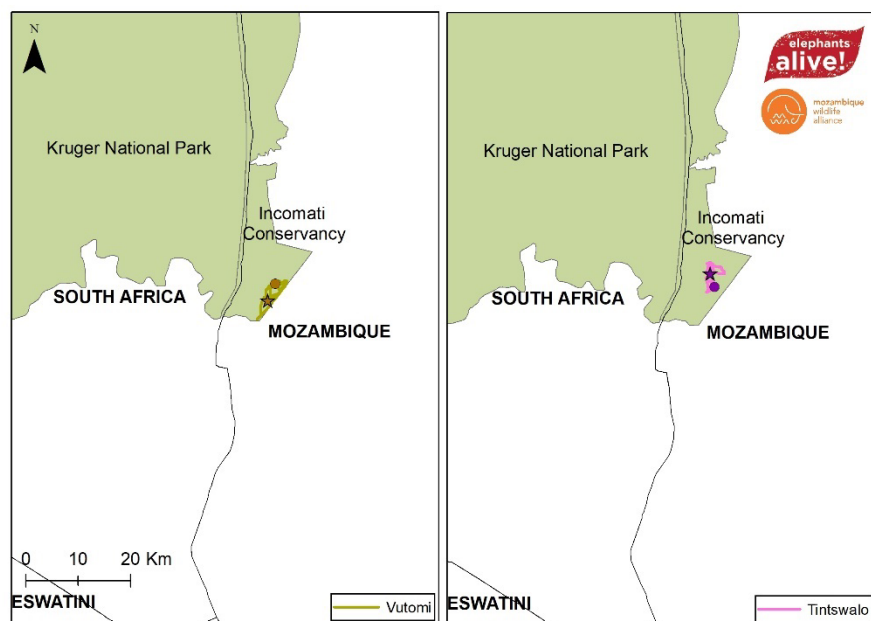
Figure 1d: Tracks for each of the 12 elephants collared in southern Mozambique, for the time periods as given in Table 1. The circle indicates the deployment date and the star indicates the end date as per Table 1 (Vutomi and Tintswalo)

Rapid response units

Four rapid response units (RRU) were employed and their tracks for this reporting period are shown in Figure 2 (see also Table 2). Most of the RRU GPS logs were taken at 30 second intervals (some were also taken at 3min, 10min and 20min intervals), explaining the high number of GPS logs (Table 2). For measure distances travelled, periods between two GPS logs that were greater than two hours were classified as a new response. For each new response, the distance travelled was calculated, per RRU, with the totals given in Table 2.

A factor to consider is that it is difficult to determine if these GPS logs include travel to and from the RRU bases (which differ between and within RRUs, e.g. a RRU may operate from two different bases). Thus, the calculated distances travelled (Table 2) represent the minimum distances travelled by each RRU within this reporting time-period.

Table 2: The number of GPS logs (mostly at a log rate of 30 seconds) and distance travelled by each rapid response unit (RRU).

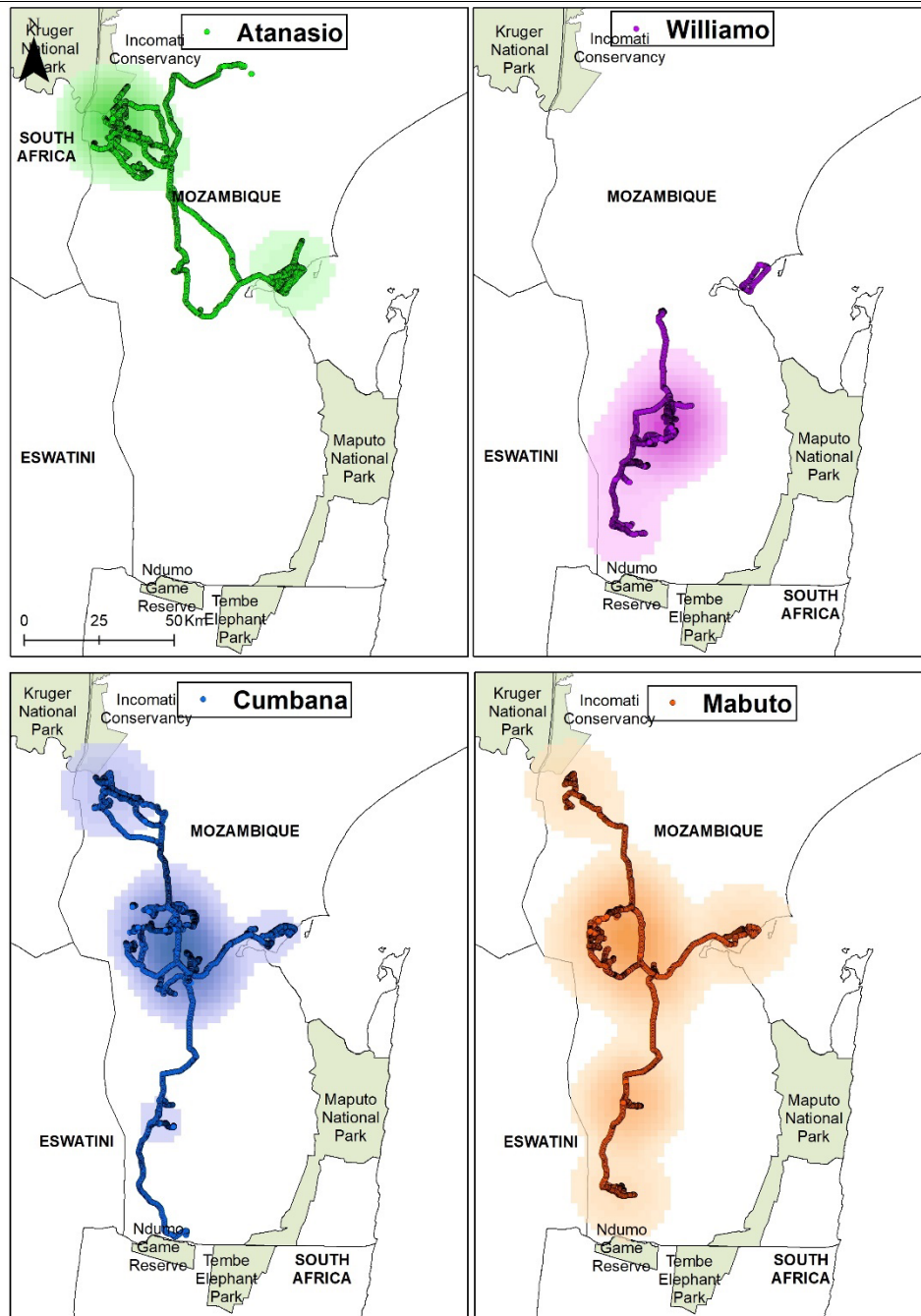| RRU	Number of GPS logs	Distance travelled (km)
Atanasio	83 885	6 884
Williamo	42 721	3 642
Cumbana	53 298	4 982
Mabuto	17 571	2 657
Total	**197 475**	**18 165**

Figure 2: Tracks of the four rapid response units (RRU) with heat maps of their responses.

RRU in relation to HEC events

A heatmap of the RRU tracks, in relation to HEC reports and responses, shows that there is overlap between reports and RRU actions (Figure 3).
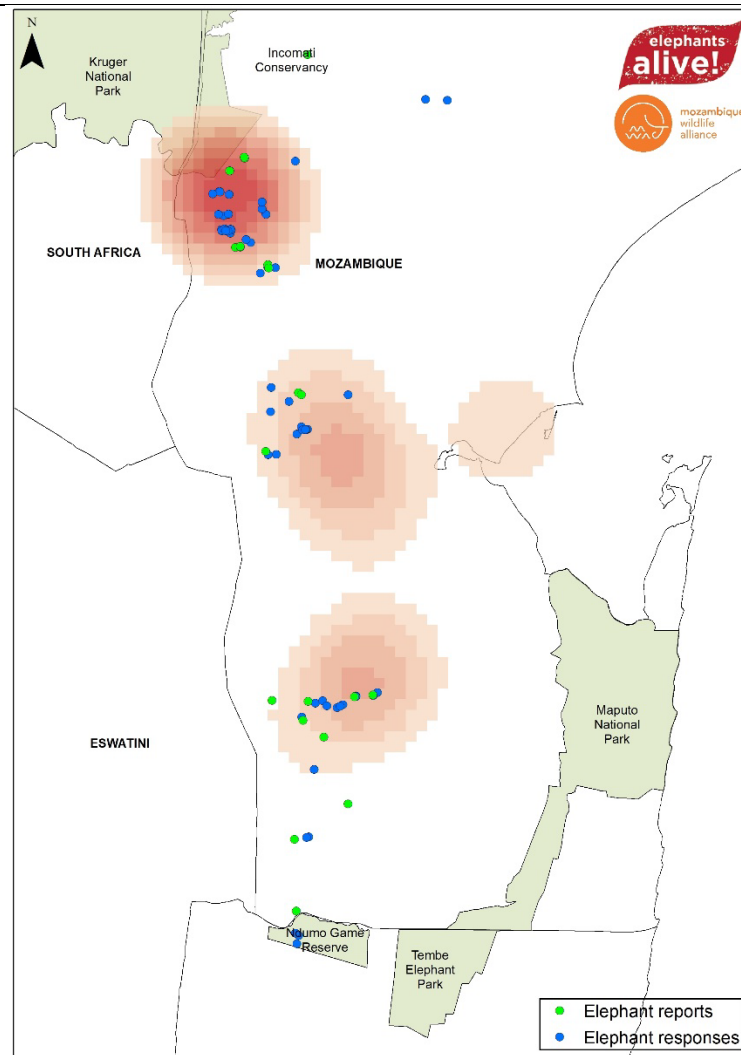
Figure 3: A heatmap of all the RRU tracks all together, in relation to the HEC reports and responses.

1.3 Spatial analysis of natural resources (plant spp. or vegetation communities) through remote sensing/GIS (Year 1), ground truthing by Year 3 to determine movement drivers

The Human Elephant risk model and supporting manuscript have been updated to better represent the risk of the total elephant population versus only the collared individuals. We also increased the manuscript's focus to better direct the reader to the importance of nutrients in modelling elephant crop-raiding behaviour. The manuscript has been submitted for review in the journal of Applied Ecology, and we are awaiting a response.

The resulting risk maps are already being implemented in the further development of a digital twin. This is being achieved by updating the relative risk maps produced in the previous project period with additional models that estimate how the risk should be updated when new, real-time data comes into the system. For instance, when an HEC event gets registered, the local risk around the new event should be updated to represent a risk that takes into account the known presence of a crop-raiding elephant nearby and the likelihood of it engaging in another raid. This model will result in a course scale risk map to estimate the risk to people for the total elephant population. The resulting maps will be deployed in an application to be used by local stakeholders—the first draft of the application is running using already available data. We are currently working on integrating real-time data streams after which the minimum viable application is ready for field testing.

Another model is under development that specifically gives more detailed information on the collared elephants. Here, the known presence of elephants will influence the crop-raiding probability. This will also allow for the integration of migratory movements. For instance, by

analysing where and when a specific problem elephant moves, people located within the likely path of the elephant can be notified beforehand and take necessary precautions.

We aim to implement these models as soon as they have minimum viability; this will provide real-time feedback from users and allow us to expand the application, make it more user-friendly, and correct potential errors.

1.4 Link laboratory analysis (glucocorticoids) with movement data for between year comparison (Year 1-3) and compare with baseline (KNP complex) in Year 3

Within South Africa the collection of glucocorticol-steroid data from the faecal samples of collared elephants is ongoing and will be used as a baseline for comparison in the corridor regions of Mozambique. Dr. Kari Morfeld, as the expert endocrinologist working on this part of the project, has only recently developed methods that would make allowance for extracting the required steroids from dry faecal samples.

2.1 Deploy RRUs to mitigate HEC Year 1-3

In the previous reporting period, candidates were identified and employed as responders for RRU within the corridors of this project. The MWA team have distributed bicycles and basic equipment to these candidates to determine their potential and motivations for the positions. The MWA team provided extensive training and effective equipment such as motorbikes. The details are shown in table 3.

Table 3: Rapid response unit (RRU) responder names and locations.

RRU names	Location
Atanasio Américo Sitoe	Moamba
Freis Armando Mabuth	Namaacha
Antonio Hafu	Namaacha
Williamo Armando Nhantsave	Namaacha/Catuane

2.2 RRU hosts educational workshops in Year 1

Between the reporting period of April-September 2024, MWA implemented seven workshops. 343 people were trained throughout these, including 289 males and 54 females.

2.3 Comparative data analysis of HEC where RRU operate in relation to other areas in Southern Mozambique within each year (Year 1-3)

The number of human-elephant conflict (HEC) reports and responses, as well as elephant sightings, are presented in Table 4, and displayed in Figure 4. The number of reports and responses in the year 2 reporting period (six months) are very close to those for year 1 (79% of year 1, in both cases). This may indicate a greater awareness in reporting and responding to HEC events since the implementation of the RRUs. The proportion of unique days in which reports and responses were made remained similar to year 1.

Table 4: Number of human-elephant conflict (HEC) reports and responses, as well as elephant sightings, for this reporting period (April–September 2024), in comparison to year 1. Also included are the number of unique days for each event type.

Event type	Number of events		Number of unique days of events	
	Year 1	Year 2 reporting period	Year 1 (% of 212 days – see annual report year 1)	Year 2 reporting period (% of 183 days)
HEC report	63	50	50 (24%)	40 (22%)
HEC response	92	73	69 (33%)	55 (30%)
Elephant sighting	22	9	19 (9%)	9 (5%)

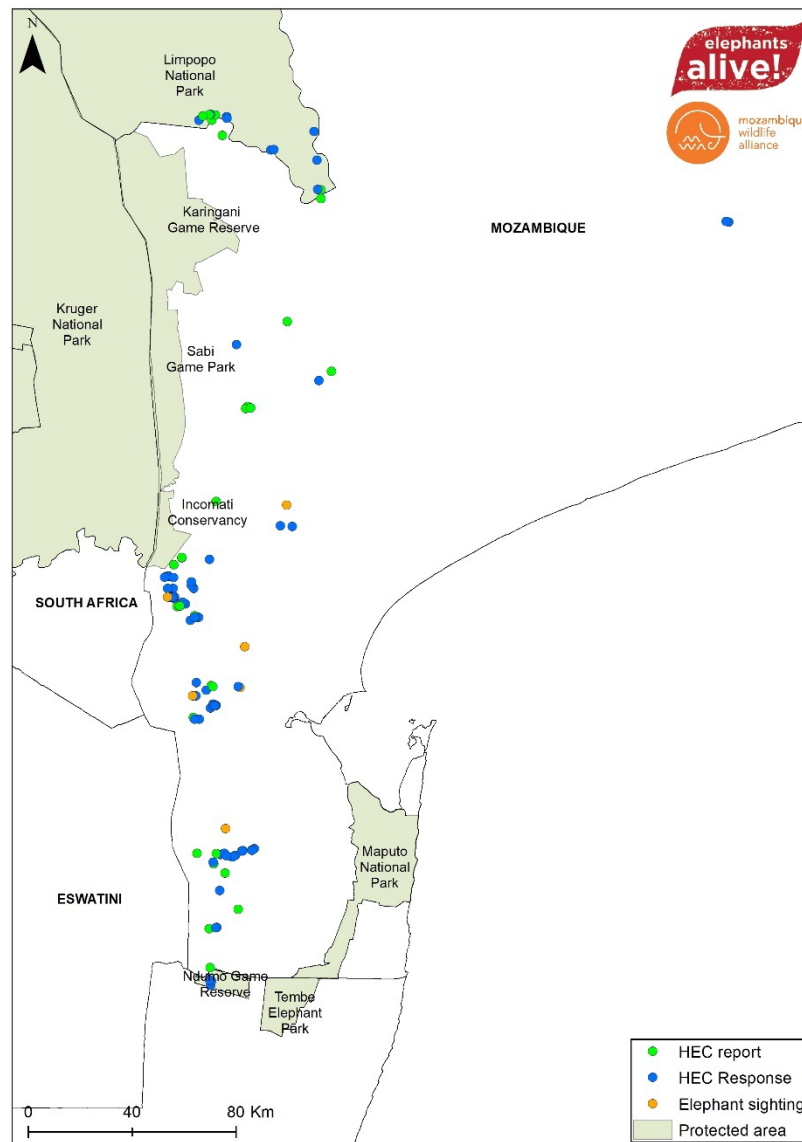| Total	177	132		

Figure 4: Human-elephant conflict (HEC) reports and responses, as well as elephant sightings, in southern Mozambique, for the first half of year 2 of the Darwin project

2.4 Establish 4 types of non-income generating barriers as demonstration plots in the Namaacha Valley (Year 1)
As described in the year 1 annual report, there are five electric fences and three soft-barrier plots (Figure 5). The soft barrier plots consist of bees, chillis, flashing lights and metal strips. Some tracks from the 12 newly collared elephants came past electric fence 3 and 4 and soft barrier plots 1–3 and only two elephants (Kopke and Cravat) came very close to electric fence 2 (Figure 5). In no instance were any of these 12 elephants logged to be inside any of these plots in the last six months.
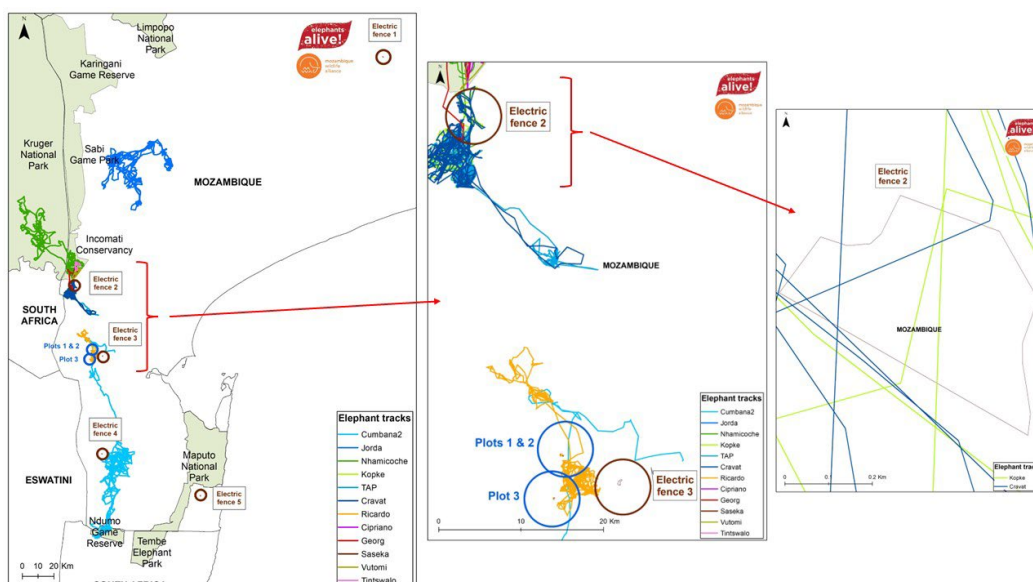
Figure 5: Tracks for all of the 12 elephants collared in southern Mozambique, including the location of electric fences 1–5 (inside the brown circles) and soft barrier plots 1–3 (inside the blue circles). Note the circles are larger than the actual barrier type.

3.1 Construction of watch towers for hosting of educational orientated workshops setup and record keeping of attendees in Year 1-3 with one tower a year
There have been seven official workshops between the two watch towers that we have implemented. In addition, there has been two more workshops per tower in the demonstration sites around the towers on beekeeping and general soft barrier mitigation maintenance. On average, there are between 30 and 33 people attending the workshop, with sex ratio 37% women versus 63% males.

3.2 Community field surveys by social scientist following non-medical human ethics guidelines in Year 1 and 3 with focus on gender-based analyses
Two social surveys have been conducted in the Namaacha Valley since the project began and a baseline survey has been commissioned. We would like to discuss updating the indicator associated with this activity to make it more relevant to our project.

3.3 One exchange program per year between South Africa and Mozambique to facilitate transfer of skills regarding growth of unpalatable crops and beekeeping. In addition, community field surveys by social scientist will follow non-medical human ethics guidelines in Year 1 and 3 with focus on resource use analyses
Elephants Alive looks forward to welcoming the members of MWA's RRU in 2025 where we will exchange skills and information to assist with permaculture, beekeeping and elephant mitigation strategies. The MWA and EA team aim to arrange a trip for this exchange in early 2025.

4.1 Replication and testing of 2 income generating barrier types (beehive fences Year 1, Plant based agriculture Year 2-3) at 2-3 farms (20-25 study sites)
See detailed explanation in 2.4.

4.2 Spatial analysis through remote sensing/GIS, and field-based data collection of elephant movements in Year 1-3 to determine reduction in HEC
Please refer to the monitoring process outlined in 1.2 and 1.3. This is an ongoing process throughout the project determining HEC events. More data is currently being collected to achieve this and will be implemented throughout the project timeline. We will discuss updating the indicator associated with this activity to make it more relevant to our project.

4.3 Community field surveys by social scientist following non-medical human ethics guidelines in Year 1 and 3 to assess efficacy of HEC strategies and combinations

We will continue to use the funds from the projects to implement another survey in Year 3.

4.4 Community field surveys by social scientist following non-medical human ethics guidelines in Year 1 and 3 to quantify increased use of barriers over time
We will continue to use the funds from the projects to implement another survey in Year 3.

4.5 Field base data collection on apiary (monthly with overall annual assessments each year since installation (Year 1 – 3)
Data is being collected monthly as anticipated. These data are dependent on seasons, as this reporting period was throughout the dry season, the following data have been recorded: At Mswazi community: nine installed with five still active and four absconded over the dry season. For Gumbe community: seven installed and none occupied over dry season and require more maintenance to keep them clean

4.6 Community field surveys by social scientist following non-medical human ethics guidelines (Year 1 and 3) to quantify the use of income generating barriers strategies
We will continue to use the funds from the projects to implement another survey in Year 3.

5.1 Community field surveys by social scientist following non-medical human ethics guidelines (Year 1 and 3) focussed on value-based statements involving biodiversity and coexistence values.
We will continue to use the funds from the projects to implement another survey in Year 3. Currently, there are a team of five people who are implementing carbon plot surveys in South Africa, in order to understand how savanna elephants impact biodiversity, carbon stocks and the net primary productivity (NPP) of African savannas. By establishing a network of Southern African global ecosystem modelling (GEM) and biodiversity monitoring sites, we aim to provide robust, empirical data on the role of elephants in shaping carbon dynamics and structuring biodiversity, contributing to more accurate climate models and improved conservation policies.

5.2 Publishing of a scientific paper in a peer-reviewed scientific journal, as well as publishing popular articles through major news outlets in Year 3 and beyond
1) Bedetti, A., Bunney, K., Wall, J., Wittemeyer, G., Vogel, S.M., Kirkman, S., Almeida, J., Douglas-Hamilton, I7 and Henley, M.D. (In prep.) Trailblazing elephants and the key landscape features that shape connectivity in Southern Mozambique.
2) Cassander C. Engelen, Henrik J. de Knegt, Michelle D. Henley. (Submitted to Journal of Applied Ecology) Uncovering the Role of Nutrients in the Crop-Raiding Risk by African Savannah Elephants.

5.3 Organising meetings and setting up MOAs with strategic organisations in Year 3
We will meet with the community in the next quarter.

5.4 Strategic fundraising endeavours for additional sources of income starting in Year 2 but secured by Year 3
We have secured funding with US Fish and Wildlife for the corridor work but also with the understanding that the corridor needs to spill over into KwaZulu-Natal in SA. To continue to upscale this Darwin Main project, we continue to look for funding opportunities.

5.5 Workshops to discuss the formulation of policies and legislation (Year 3) to enable the development of Biosphere Reserves and ensure governmental gazettement (post Year 3)
We will continue to establish partnerships with NGOs. Mozambique is a biodiversity-rich country which faces a complex array of conservation, conflict, and law enforcement challenges. Over the past two years, the country's conservation status and law enforcement efforts have seen both improvements and deteriorations, influenced by political, economic, and environmental factors. Progress has been mixed, with both improvements in some conservation areas and serious setbacks due to conflict and governance issues. Continued international support and a focus on community-led conservation could help improve the situation moving forward.

Improvements represent international support and funding that have been growing from international conservation organisations and NGOs. From South Africa, Conserve Global and the Endangered Wildlife Trust are new additions to the NGO support network. Ecotourism, which was impacted by the pandemic have been recovering in the last two years. There have been notable investments in training and equipping park rangers to combat poaching, particularly through collaborations with foreign governments and conservation organisations. The government has enacted stricter wildlife laws and increased penalties for poaching and illegal logging. These legislative changes, combined with international pressure, have resulted in more significant prosecutions of poachers and traffickers (Refer to Table 1, APPENDIX A for selected legislative frameworks).

Table 5: Legislative frameworks applicable with Mozambique.

Theme	Mozambique
Legislative framework for wildlife conservation and human-wildlife conflict management	**Resolution no. 58/2009, December 29, human-wildlife conflict management strategy**
National and regional strategic plans for elephant conservation and management	**Strategy and action plan for elephant conservation**
National biodiversity strategies & action plans for conservation & sustainable management	Mozambique strategy and action plan for biological diversity conservation (NBSAP: 2015-2035)
Legislation for environmental protection and biodiversity conservation	Biodiversity Conservation Act, no. 16/2014 of June 20 (revised as act no. 5/2017 of 11 may)
Integrated climate change adaptation and mitigation strategies for sustainable development	National strategy for adaptation and mitigation of climate change, 2013-2025
Forest-based climate action and carbon management for sustainable development	National strategy for the reduction of forestry and degradation emissions, forestry conservation, and increase of carbon reserves through forests (REDD+) (2016-2030)
Regulatory frameworks for redd+ implementation and ecosystem protection	Regulations for implementation of inherent projects to REDD+ (DECRET 23/2018 of May 3)
Comprehensive environmental management and conservation frameworks	Environmental management Act, 2007 (no. 7 of 2007)
Integrated land use, agricultural conservation, and wildlife management policies	Land act, no. 19/97 of October 1st
Regulation and control of wildlife trade and conservation	Regulations relating to controlled wildlife products and trade (GN no. 144 of 2011).
Land use planning and nature conservation regulations	Territory ordination act (law no. 19/2007 on 18 July)
Strategic land use and territorial development planning	National territorial development plan (resolution no. 7/2021) of December 28
Strategic forest management and development planning	Forest policy statement.
Comprehensive forest resource management and conservation legislation	Forest resource protection, conservation and use act (act no. 17/2023 of December 29, 2023, repeals act no. 10/99, 7 July)
Regulation of fees and charges for faunal resource management and use	Regulation on the value of exploration rates of faunal resources (decree n. 83/2017 of 29 December)
Fee structure for conservation area access and use	Regulations on fees to be charged in conservation areas (decree no. 84/2017 of December 29)
Framework for biodiversity compensation and offset measures	Biodiversity offset directive (ministerial diploma 55/2022 of May 19)
Regulation of genetic resources and protection of threatened species	Regulations for access and sharing of benefits from genetic resources (decree 19/2007 on 9 august)
Climate change monitoring, biodiversity protection, and resource management	National system for monitoring and evaluation of climate change, October 2014
Regulation and management of invasive and alien species	Regulation for control of exotic and invasive species (decree no. 25/2008, 1 July)
Regulation and compliance with cites for wildlife protection	Regulation covers the cites convention (decree no. 34/2016, 24 August)

Regulation and management of tourism and wildlife concessions	Tourism act of 4/2004.

2. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

None to record.

3. Have any of these issues been discussed with NIRAS and if so, have changes been made to the original agreement?

Discussed with NIRAS:	Yes/ **No**
Formal Change Request submitted:	Yes/ **No**
Received confirmation of change acceptance:	Yes/ **No**

Change Request reference if known: *If you submitted a financial Change Request, you can find the reference in the email from NIRAS confirming the outcome*

4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2024 – 30 September 2024)

Actual spend:

4b. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this financial year (ending 31 March 2025)?

Yes ☐　　**No** ☒

4c. If you expect and underspend, then you should consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a re-budget Change Request as soon as possible. There is no guarantee that Defra will agree a re-budget so please ensure you have enough time to make appropriate changes to your project if necessary. Please DO NOT send these in the same email as your report.

NB: if you expect an underspend, do not claim anything more than you expect to spend this financial year.

5. Are there any other issues you wish to raise relating to the project or to BCF management, monitoring, or financial procedures?

As mentioned in the first section, we would like to continue discussions on core indicators alignment to maintain and achieve the most effective M&E process. We will also be discussing how we can adapt two of our indicators moving forward into the next stage of the project. These have been detailed in Section 6.

6. Please use this section to respond to any feedback provided when your project was confirmed, or from your most recent annual report. If your project was subject to an Overseas Security and Justice Assistance assessment, please use this space to comment on any changes to international human rights risks, and to address any additional mitigations outlined in your offer letters. Please provide the comment and then your response. If you have already provided a response, please confirm when.

We appreciate feedback from the reviewers and will address comments from the most recent annual report here, matching the format of the review report:

2. Comments and queries for project leader:

- Under Output 2, it is unclear why fewer workshops have been delivered than planned and why the number of participants is greater than planned. It is unclear if this is an over- or underachievement. Please clarify.
  - As specified in our HY R1, we decided to have smaller workshops with larger groups and therefore greater impact. Therefore, this is an overachievement we have more people engaged with safety around elephants.

- Under Output 3, The information provided by the project does not specifically address the agreed measurable indicators so progress towards this Output cannot be assessed.
  - The established watch towers facilitated an increase of 50% attendance of households from the Namaacha Valley in Year 1, and we continue to work towards the increase of 80% as the project progresses. See 3.1 in this report for the latest supporting figures. We would like to discuss indicator 3.2 with the Darwin team and have reached out to the appropriate support. We continue to work towards a 40% increase in the number of alternative income crops, by implementing and monitoring unpalatable elephant crops and beekeeping.

- While the project log frame reports that Indicators 4.2, 4.4 and 4.6 are completed, this is erroneous. The indicators have not been fulfilled – only the baseline data has been collected to allow future monitoring.
  - Apologies for the erroneous data indication on our log frame. We can confirm that baseline data have been collected for these indicators.

There are two indicators that we have flagged on the log frame that we would like to discuss with the Darwin team, and we will reach out accordingly with the appropriate change request form. For reference, these are as follows:

3.2 80% increase in the number of women attending workshops by Year 3 relative to Year 1.

4.2 40% average reduction in crop-raiding between the five mitigation strategies by the end of Year 3.

Checklist for submission

For New Projects (i.e. starting after 1st April 2024)	
Have you **responded to any additional feedback** (other than caveats) received in the letter you received to say your application was successful which requested response at HYR (including safeguarding points)? You should respond in section 6, annexes other requested materials as appropriate.	N/A
If not already submitted, have you attached your **risk register**?	N/A
For Existing Projects (i.e. started before 1st April 2024)	
Have you responded to **feedback from your latest Annual Report Review?** You should respond in section 6, annexes other requested materials as appropriate.	X
For All Projects	
Include your **project reference** in the subject line of submission email.	X
Submit to **BCFs-Report@niras.com**.	X
Have you **clearly highlighted any confidential information** within the report that you do not wish to be shared on our website?	X
Have you reported against the most **up to date information for your project?**	X
Please ensure claim forms and other communications for your project are not included with this report.	X