Darwin Initiative Main & Extra Annual Report

To be completed with reference to the "Project Reporting Information Note":
(https://www.darwininitiative.org.uk/resources/information-notes/)

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes)

Submission Deadline: 30th April 2025

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Darwin Initiative Project Information

Scheme (Main or Extra)	Main
Project reference	DIR29S2\1073
Project title	Promoting connectivity to create Living Landscapes in southern Mozambique
Country/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)
Project partner(s)	PAMS Foundation, Sensing Clues, For Elephants, Elephant Crises Foundation, Elephants Alive
Darwin Initiative grant value	£449,858
Start/end dates of project	01/04/2023 - 31/03/2026
Reporting period (e.g. Apr 2024 – Mar 2025) and number (e.g. Annual Report 1, 2, 3)	April 2024 – April 2025
Project Leader name	Antonio Alverca; Mozambique Wildlife Alliance
Project website/blog/social media	Regular updates via Elephants Alive social media page: https://elephantsalive.org/
Report author(s) and date	Dr Michelle Henley, Antonio Alverca, Dr Katie Thompson, Cassander Engelen (30/04/2025)

1. Project summary

Over half of African elephants occur outside Protected Areas (PAs), resulting in Human-Elephant-Conflict while human development isolates PAs. Solutions involve Biosphere Reserve declarations, consisting of PAs linked by community-owned corridors with occupants practicing elephant compatible livelihoods. We propose a phased approach in Mozambique where collared elephants delineate corridors while rapid response units (RRUs) ensure peoples' safety. Social surveys and educational subcentres enable an understanding of people's needs and facilitate knowledge transfer around crop protection. Overall, elephant corridors promote ecological connectivity.

Connecting ecosystems to enable essential ecological functions at landscape scale is of critical biodiversity importance. Linked ecosystems promote ecological functions such as migration, hydrology, nutrient cycling, pollination, seed dispersal, food security, climate resilience and disease resistance at landscape scale. A key target for the Global Deal for Nature involves the reconnection of isolated megafaunal reserves via corridors. Connecting Protected Areas (PAs) across political borders, alongside building more sustainable, rural economies in collaboration with communities that live in and around corridors delineated by elephant movements, represents

an important long-term solution to cooperatively address broader conservation concerns centred around biodiversity.

Elephants as keystone species and ecosystem engineers with large spatial requirements, are capable of forging vital corridors between PAs. However, these linkages are being threatened by ivory poaching practices and increasing competition over resources with burgeoning human populations. Escalating human-elephant-conflict (HEC) directed towards elephants, can thus differ in severity and take the form of poaching, retaliatory killing or crop-raiding. Continentally, elephants are listed as Endangered (IUCN Red List of Threatened Species). Currently, 54.7% of elephant's range is found outside of PAs and 76% of elephants are found in international transboundary populations such as those sharing borders between Mozambique, Zimbabwe, South Africa and Eswatini.

In 2018, Elephants Alive (EA) and the Mozambique Wildlife Alliance (MWA) identified corridors linking PAs across international boundaries. However, as 55% of Mozambique's human population lives on less than $1 per day subsistence farmers are often left vulnerable through climatic events and conflict over limited food sources with elephants. Poverty and corruption are known to be stronger catalysts of poaching than the lack of law enforcement. Consequently, Mozambique has been identified as one of the countries with severe levels of illegal elephant killings within PAs. Outside of PAs, where elephant's cross human dominated landscapes primarily at night, HEC involves crop-raiding, and it occurs most where people have neither the experience of coexisting with elephants nor the financial resilience or tolerance of such events.

If elephants are to survive, we need scientific knowledge and an intimate understanding of their movements and spatial requirements in combination with understanding the needs of the people that share the landscape with elephants. This is particularly necessary where vital corridors have been identified and where innovative ways are needed to make people's livelihoods compatible with conservation outcomes. These challenges call for an understanding of the socio-economic needs of the people sharing the landscape with elephants to empower them as benefactors of community owned corridors delineated by collared elephants. The corridors are needed to accommodate compressed subpopulations of elephants as part of a larger transnational meta-population, facilitating increased genetic resilience, ensuring the preservation of phenotypic traits (large tusks), and decreasing pressure on biodiversity within isolated reserves. We propose a transnational community-based approach to protect African elephants and their habitat through a unique multidimensional and integrated approach of community engagement, knowledge creation, and practical conservation action. We use innovative ways to increase people's tolerance and safety, protecting assets and increasing food security.

2. Project stakeholders/ partners

Lead Partner:

Mozambique Wildlife Alliance (Dr. Carlos Lopes Pereira and Dr. Joao Almeida: Mozambique)

Other partners (name and country):

Elephants Alive (Dr Michelle Henley, Dr Katie Thompson, Cassander Engelen, Dr Silvia Kirkman: South Africa and remote)

The Elephants and Bees Project Save the Elephants (Dr. Lucy King: Kenya)

For Elephants (Dr. Kari Morfield: United States)

Sensing Clues (Dr. Jan-Kees Schakel: Netherlands)

PAMS Foundation (Krissie Clark: Tanzania)

Continental partnerships:

The MWA is mandated by ANAC (state entity) to operate on their behalf in conservation and HEC related subjects. Under EA's financial assistance and shared expertise, the two NGOs represent the implementation agents of the project.

The Elephants and Bees Project advises on bees as a mitigation strategy. Skills transfer initiatives between Kenya and Mozambique will take place through exchange programs and on-site training.

PAMS Foundation advises on community engagement methods, wildlife security and mitigation strategies involving capsicum and will be involved in skills transfer between Tanzania and Mozambique.

International partnerships

For Elephants assists in profiling faecal stress and health indices of corridor-moving elephants which will help to evaluate the success of the corridor.

Sensing Clues Foundation develops Digital Twins to model elephant behaviour. Its predictions will be used to prevent HEC.

The lead partner of this project is the Mozambique Wildlife Alliance (MWA), where Antonio Alverca (Head of Human Wildlife conflict) has been the lead partner based in Mozambique (please see section 1 for the summary of why Mozambique was suitable as a high priority country). The roles and responsibilities for the MWA throughout the project, was to administer the grant and coordinate the delivery and implementation of the project's outcomes. MWA have been organising, coordinating and implementing field work and maintaining close relationships with the communities in the targeted areas via the relationship-strengthening activities of the RRUs. Under the guidance of the Project Leader, the RRU will continue to train, organise workshops and disseminate information to build capacity within Mozambique throughout the project timeline. MWA has significant experience working locally due to the RRUs establishment and operations throughout southern Mozambique. Together with EA, MWA have been managing, disbursing and reporting on the majority of the donor funds. To date, MWA has been a key partner in the dissemination of training, RRU implementation and training for RRUs and community training. Please see section 3 for more details on achievements and lessons that have been achieved throughout the first full year of the project (full narrative report).

The other integral partner to the project is Elephants Alive, including Dr Michelle Henley and the other aforementioned staff. EA is a long-standing NGO that branched off from STE in earlier years, and which has extensive experience in researching transboundary elephants in southern Africa and has extensive experience finding science-based solutions and funds to the challenges elephants face today. EA has conceptualised the vision and designed the research work, thereby contributing extensive scientific and practical experience to the project since the first elephant was collared outside of PAs in 2018. EA staff have begun to analyse and delineate corridors over time, analysing baseline data to identify conflict hotspots and developing HEC probability maps, largely done by Cassander Engelen and Drs. Silvia Kirkman and Katherine Bunney (see section 3 for a full narrative report). EA are also working to publish the results in peer reviewed scientific journals together with the project partners.

All of the aforementioned partners have been involved with the project planning, monitoring and evaluation and decisions making. The project partners team have been holding regular meetings to discuss and review the M&E actions and decisions to date and will continue to do these throughout the timeframe of the project. Dr Katie Thompson (Elephants Alive) works remotely in England and manages the M&E reporting. Together, with regular partner discussions, the team reviews the detailed log frame and records any progress along with challenges. Please see the main narrative report (Section 3) for more details including stakeholder and local communities' involvement.

3. Project progress

3.1 Progress in carrying out project Activities

The following activities took place to support the achievement of output 1:

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):
A total of 20 elephant collars were deployed during the first two years of the grant (Table 1). One of the collared elephants, Sugar, died, and the collar was subsequently re-deployed on another individual named Sugar2. In January 2025, a 21st collar was deployed as part of the third year of the grant. As this deployment falls outside the reporting period, it is not included in the analyses presented here; data from this collar will be included in the final year of the project.

Table 1: Deployment date, end date (final day of this reporting period: 31 March 2025; except for three elephants – please see Table footnotes), the number of GPS points logged and total distance travelled within the given time-period, for the 20 collars deployed onto elephants in southern Mozambique during the two-year period.
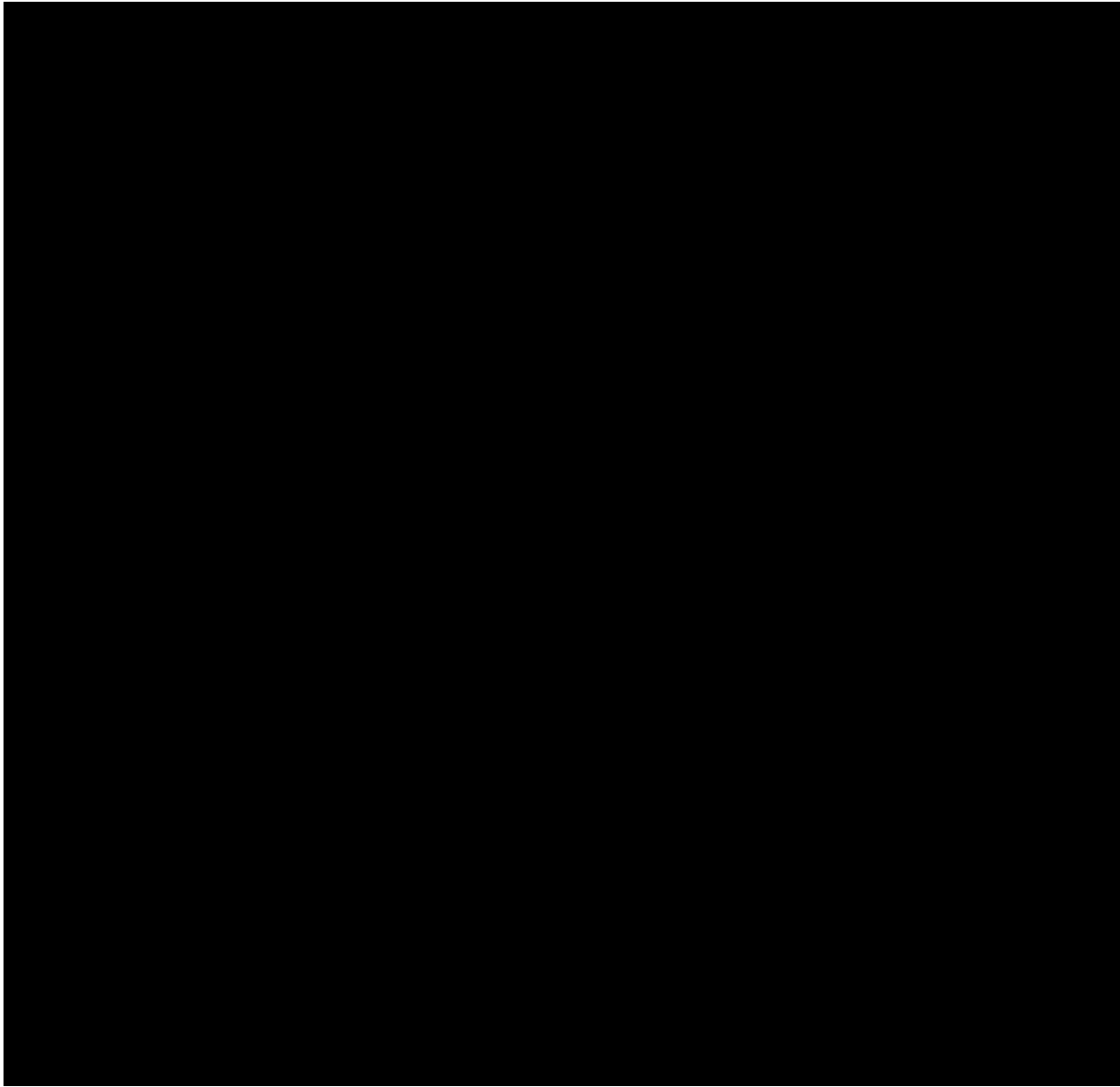
Elephant name	Sex	Deployment date	End date	Number of GPS points	Total distance travelled (km)
Phenix[1]	Female	2023/06/21	2024/05/08	1 119	1 590
Sugar[2]	Male	2023/08/14	2024/09/27	9 765	4 305
ERPF1	Female	2023/08/14	2025/03/31	13 858	5 753
Molwene	Male	2023/09/08	2025/03/31	13 995	6 102
Sunday	Male	2023/11/26	2025/03/31	11 762	5 022
Edu	Male	2023/12/12	2025/03/31	12 613	4 746
Anks	Female	2024/02/08	2025/03/31	9 786	6 939
Mr HP[1]	Male	2024/04/04	2024/04/13	22	69
Sugar2	Male	2024/10/09	2025/03/31	4 118	2 098
Cumbana2	Male	2024/04/19	2025/03/31	6 375	3 219
Jorda	Male	2024/05/16	2025/03/31	7 595	3 323
Nhamicoche	Male	2024/05/17	2025/03/31	7 679	2 601
Kopke	Male	2024/06/06	2025/03/31	7 100	2 641
TAP	Female	2024/06/06	2025/03/31	7 380	2 352
Cravat	Male	2024/07/18	2025/03/31	6 102	2 375
Ricardo	Male	2024/07/25	2025/03/31	5 932	2 172
Cipriano	Male	2024/09/26	2025/03/31	7 090	2 222
Georg	Male	2024/09/26	2025/03/31	4 495	2 023
Saseka	Male	2024/09/27	2025/03/31	4 403	2 094
Vutomi	Male	2024/09/27	2025/03/31	4 564	1 873
Tintswalo	Male	2024/09/27	2025/03/31	4 397	1 784

[1] *The collars of both Phenix and Mr HP inexplicably stopped at the given end dates. It is possible that the collars either malfunctioned or that these elephants succumbed.*
[2] *Sugar had an injury (complete fracture of the left humerus bone, potentially from having been shot) and had to be euthanised. Sugar's collar was then redeployed on Sugar2.*

1.2 Spatial analysis of elephant movements through remote sensing/GIS, and field-based data collection in Year 1-3:

An elliptical time-density model was used to calculate the home range of each of the 20 collared elephants, with the 99th percentile of location data defining the area each elephant occupied and traversed during the study period (Figure 1). Figure 1 illustrates the spatial overlap of these home ranges, with yellow and red areas indicating regions of higher overlap. These areas highlight a key movement corridor extending from southern Kruger National Park (South Africa), through Mozambique, to the northern border of KwaZulu-Natal Province in South Africa. The elephant Chjuku was excluded from this analysis, as he was collared outside the main study area using the redeployed collar from Sugar.

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:

During this reporting period, the Human-Elephant Conflict (HEC) risk model and its supporting manuscript were updated to more accurately represent the risk posed by the entire elephant population, rather than only the collared individuals. Additionally, we enhanced the manuscript's focus on the role of nutrient availability in influencing elephant crop-raiding behaviour—an increasingly recognised driver of HEC. We are pleased to report that the manuscript is currently within is second round of correction after which time we hope I will be accepted in the *Journal of Applied Ecology*, and we anticipate final publication shortly.

The refined risk maps generated from this model are already being applied in the development of a digital twin system, which remains a key focus going into Year 3 of the project. The digital twin builds on previous risk maps by incorporating new, dynamic models that adjust predictions in real-time. For instance, when an HEC event is recorded, the system recalibrates local risk estimates to reflect the increased likelihood of further incidents in that area, based on known elephant presence and behavioural patterns. This process enables the generation of coarse-scale, population-level risk maps that are designed to support proactive decision-making by local stakeholders.

A functional prototype of the digital twin application has been developed using existing data, and integration of real-time data streams is currently underway. Once this integration is complete, the application will reach minimum viable product (MVP) status and will be ready for field testing. The

goal is to provide an accessible tool for community members, conservation managers, and authorities to better anticipate and respond to HEC events.

In parallel, we are developing a complementary model that offers more granular risk assessments based specifically on the movements of collared elephants. This will allow for the prediction of crop-raiding probabilities tied to individual elephants and their movement trajectories. For example, the system could issue alerts to communities likely to be affected by the approach of a known high-risk elephant, allowing for early warning and timely mitigation.

We plan to implement both models as soon as they reach MVP status. Early deployment will enable real-time user feedback, which will be critical in refining the tool, improving user experience, and addressing any system errors. Ultimately, this digital twin approach aims to increase human safety, reduce conflict, and promote coexistence through informed, data-driven action.

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:

In South Africa, the collection of glucocorticoid steroid data from the faecal samples of collared elephants is ongoing. These data will serve as a physiological baseline for comparison with elephants inhabiting the identified corridor regions in Mozambique. This component of the project is being led by Dr. Kari Morfeld, a specialist in wildlife endocrinology. Dr. Morfeld has recently developed and validated a new method that enables the extraction of the relevant stress hormones from dry faecal sample - an important advancement that facilitates analysis in remote and arid environments where preserving wet samples is often not feasible.

The following activities took place to support the achievement of output 2:

2.1 Deploy RRUs to mitigate HEC Year 1-3: During the previous reporting period, suitable candidates were identified and employed to serve as Rapid Response Unit (RRU) responders within key corridor areas of the project. To assess their suitability and motivation for the roles, the Mozambique Wildlife Alliance (MWA) team first distributed bicycles and basic field equipment to the selected individuals as part of an initial evaluation phase.

Following this, responders who demonstrated commitment and capability received additional support, including comprehensive training and the provision of more advanced equipment such as motorbikes. These efforts aim to enhance the mobility and effectiveness of RRUs in addressing Human-Elephant Conflict (HEC) incidents promptly and efficiently (see 2.3).

2.2 RRU hosts educational workshops in Year 1: During Year 1, the MWA team conducted 12 training sessions, reaching a total of 420 participants (276 men and 144 women). Although the initial target of 16 workshops was not met, the team adapted by delivering fewer but larger sessions, ensuring the baseline participant target was achieved.
Training was delivered at two levels:
1. District Authorities and Community Members – Focused on HWC management, clarification of legal responsibilities, and MWA's approach to conflict mitigation and prevention.
2. Community Mitigation Officers – Included the above content with additional emphasis on the strategic use of mitigation tools, elephant behaviour, and field-based response strategies.
These sessions aimed to build local capacity for managing HWC effectively and sustainably.

In year 2, the MWA team conducted 14 training sessions, reaching a total of 691 participants (506 men and 185 woman), representing a 64,5% increase for the previous year.

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 for the two-year time-period are presented in Table 2. The number of reports were higher in year 1 than in year 2, whereas the number of responses were higher in year 2.

The proportion of unique days in which reports were made was highest in year 1, but for responses the proportion of unique days was similar between years 1 and 2.

Table 2: Number of human-elephant conflict (HEC) reports and responses for this two-year reporting period (April 2023 – March 2025). 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	Year 1 (% of 365 days)	Year 2 reporting period (% of 365 days)
HEC report	128	89	97 (27%)	69 (19%)
HEC response	146	188	112 (31%)	127 (35%)
Total	**274**	**277**		

Four rapid response units (RRU) were used and their tracks for this reporting period are shown in Figure 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 3). To measure distances travelled, time 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 3.

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 3) represent the minimum distances travelled by each RRU within this reporting time-period.
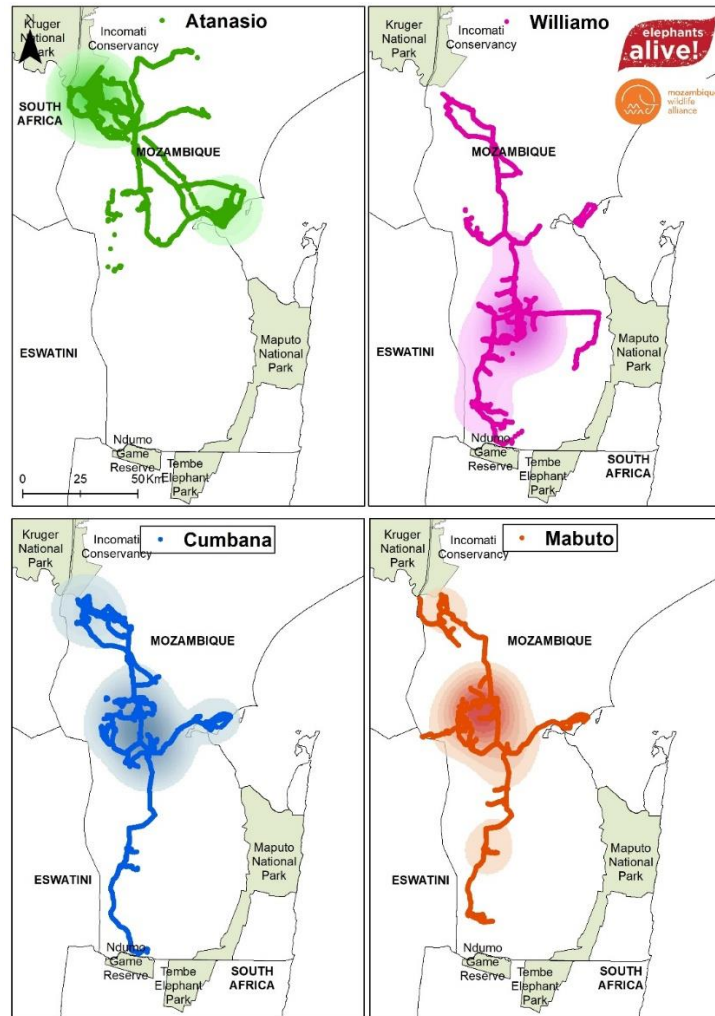
Figure 2: Tracks of the four rapid response units (RRU) with heat maps of their responses.

Table 3: The number of GPS logs (mostly at a log rate of 30 seconds) and distance travelled by each rapid response unit (RRU).

RRU	Time period	Number of GPS logs	Distance travelled (km)
Atanasio	January 2024 to March 2025	162 988	14 166
Cumbana	December 2023 to March 2025	82 009	7 524
Mabuto	March 2024 to March 2025	41 426	5 475
Williamo	September 2024 to March 2025	86 159	8 733
Total		**372 582**	**35 898**

A heatmap of all the RRU tracks, in relation to HEC reports and responses, shows that there is overlap between reports and RRU actions (Figure 6).
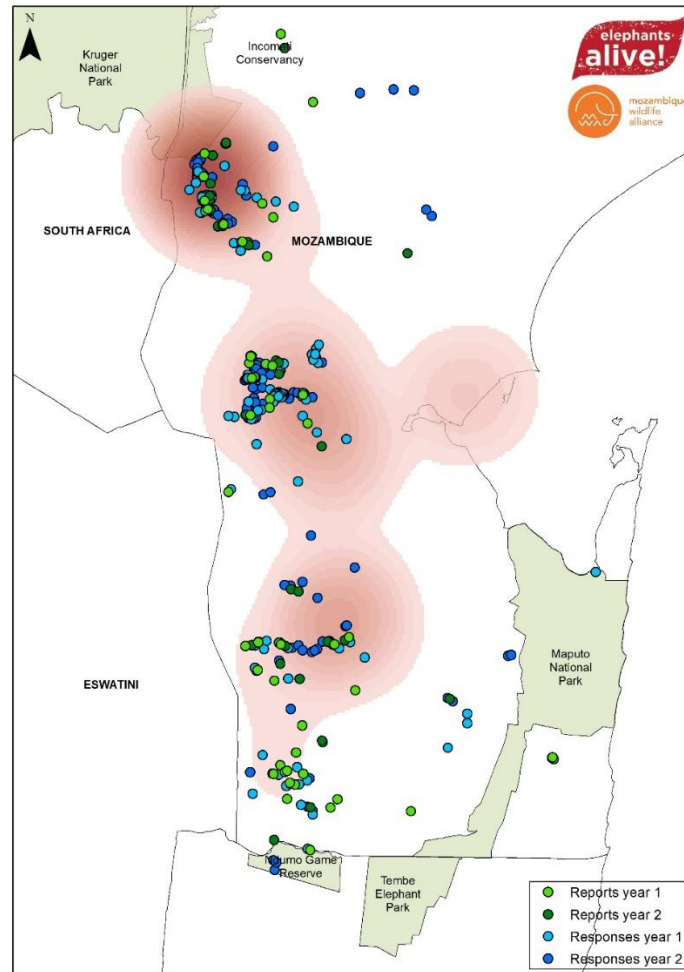
Figure 3: A heatmap of all the RRU tracks all together, in relation to the HEC reports and responses.

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 4). The soft barrier plots consist of bees, chillis, flashing lights and metal strips, at two main sites while both sites were trained in how to make smelly elephant repellent as an additional mitigation method: Gumbe (Plot 1) and Mswazi (Plots 2 and 3). The use of chilli, either as we demonstrated in a chilli-rag fence design, or mixed with dung and burnt as a deterrent, is effective. However, regular maintenance of chilli rage fences has proven challenging, especially in the growing season when regular rain also means that maintenance is required frequently. Hence, the Mswazi site has opted for rather switching to burning chilli mixed with dung towards the end of March 2025 as the preferred method when applying capsicum-related mitigation techniques. Here chilli mixed with dung is burnt in a metal holder (mbula style).

A summary of elephant break-ins for each electric fence or soft barrier, by all EA collared elephants in the region (not only the 20 elephants collared during the Darwin programme) (Figure 2):

- Electric fence 1: no break-ins.
- Electric fence 2: 41 GPS points, 4 elephants (only one elephant of four breaking into this plot had more than 10 points inside the fence). April–Sep 2023, May 2024, Oct 2024, March 2025.
- Electric fence 3: 2 points, 2 elephants. May 2024, April 2025.
- Electric fence 4: 8 points, 1 elephant. April–May2023.
- Electric fence 5: no break-ins since fortification (refer to the text below).
- Soft barrier plot 1 (there's a river on the eastern border): 4 points of which 3 are along the riverbed and the fourth is close to the fence border. Oct–Nov 2024. The Gumbe community

only reported one break-in in total in the initial stages of the project and no break-ins subsequent to that.

- Soft barrier plot 2: 4 coming from 3 different collared elephants of which 3 points were recorded close to the fence border. June 2023, April 2024, March 2025.
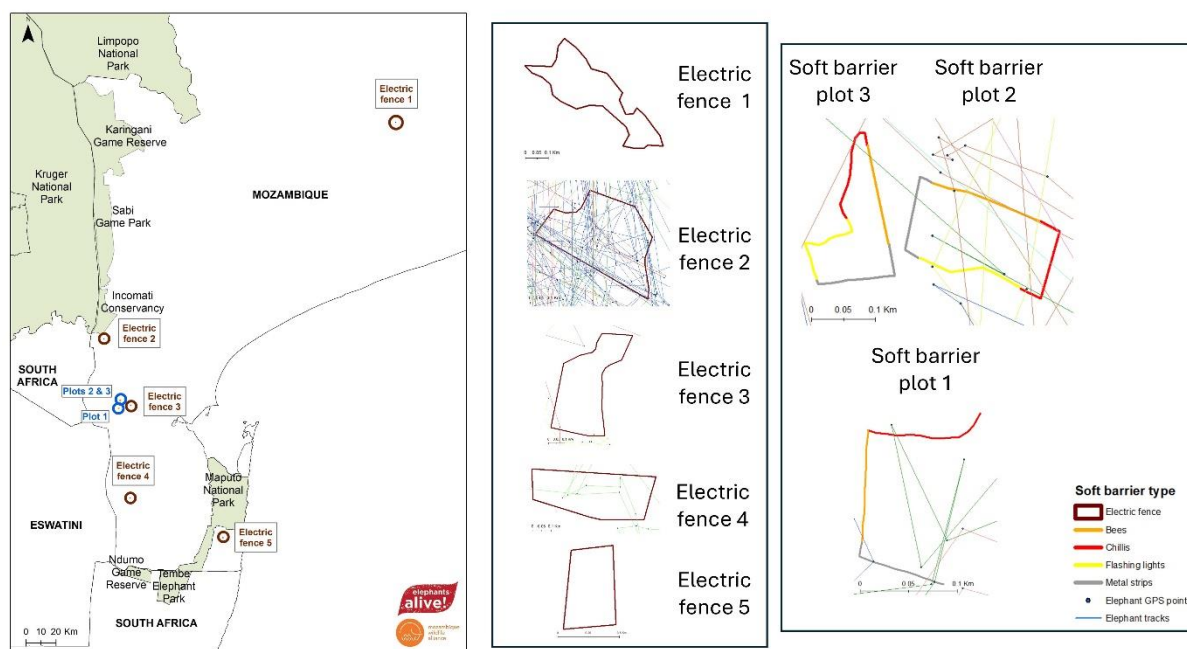- Soft barrier plot 3: no break-ins.

Figure 4: Elephant tracks in relation to the five electric fences (inside the brown circles) and three soft barrier plots (inside the blue circles).

Due to positional uncertainty inherent in GPS data, points situated near the boundaries of fences or plots have a reduced likelihood of being conclusively classified as within the designated area. Also, due to the small sizes of the fenced areas, it is possible that an elephant could've walked right through it in between logging of two GPS points, especially when collar logging rates are set at hourly intervals. We have received dozens of reported "break-ins," though many of these do not represent actual incidents. The most accurate way to verify these reports is by cross-referencing them with corresponding Human-Wildlife Conflict (HWC) or HWC response reports, which are completed whenever such events are confirmed. It is also important to note that we only have visibility of those elephants that are collared. For the break-ins into soft barrier plots, none of these GPS points inside the soft barrier plots coincided with reports of elephant break-ins from the community. The break-ins they reported on were therefore all due to uncollared elephants.

Nevertheless, it seems that both electric fences and soft barriers aren't completely effective in preventing elephant break-ins. As elephants are known problem-solvers, it is to be expected that no barrier will be completely effective in perpetuity. For example, beehive fences lose their efficacy during drought periods when bees abscond (King et al. 2024) while standard electric fence designs need to be adapted if elephants learn to bridge them. One of the fence plots to the east of the Futi corridor (Electric fence 5) had to be fortified with protruding steel 'whiskers' from the standard electric line as uncollared elephants in this area had learnt to break standard electric fences. Regular maintenance is key the success of all barrier types.

A survey completed in December 2024 by the community at soft barrier plots 2 and 3 suggests that the incidents of elephant crop-raiding are usually in the Summer/wet season (November to March) and that break-ins were reduced after the implementation of the soft barriers, resulting in an increase in their crop harvests (Figure 5).
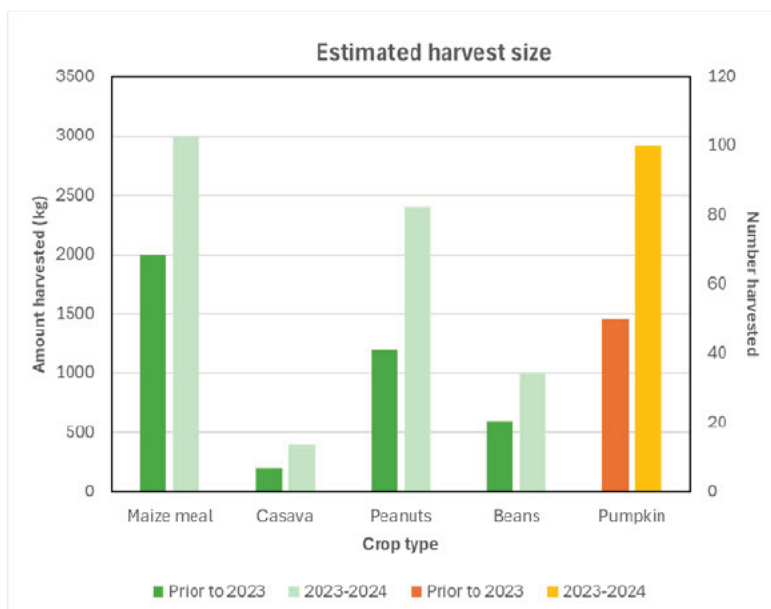
Figure 5: Estimated harvest size of crops from soft barrier plots 2 and 3, before (prior to 2023) and after (2023-2024) the implementation of the soft barriers. Maize meal, casava, peanuts and beans were estimated as kilograms from numbers of bags filled, and pumpkins were counted.

Further information received from the communities, regarding the soft barriers, indicated that most elephant break-ins occurred between midnight and 03h00 and that the elephants favoured soft barrier plot 2 as this subsistence farmer is far more active than the farmer using plot 3. Break-ins occurred within the months of December to May. Break-ins resulted in crop losses, especially of the main crops grown in each plot (e.g. maize, peanuts). Break-ins are likely dependent on the type and number of crops that are being grown inside.

In total, most of the break-ins occurred through the metal strips and bees' barriers (six break-ins each), whereas flashing lights barriers were broken through the least (three times). The flashing lights at plots 2 and 3 were reported stolen and the barriers had to be adapted thereafter. Beehive activity was compared to rainfall for the region (Figure 6). Although no clear pattern is seen yet, due to the paucity of data at this stage, beehive activity continues to be monitored on a weekly or bi-monthly basis so that a more though analysis can be made.
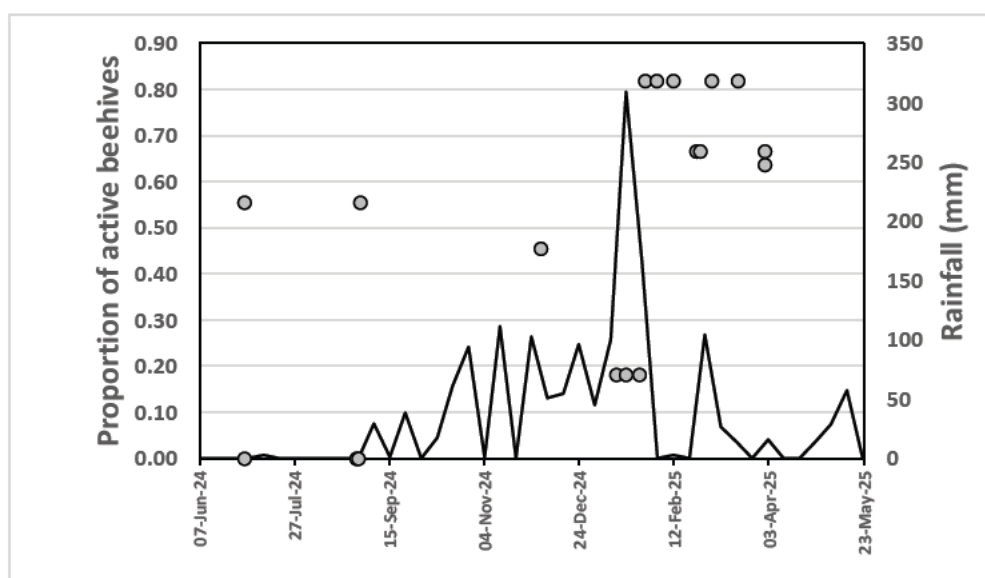

Figure 6: The proportion of beehives that were active at all the soft barriers combined (dots), compared to rainfall (line) in the region during the same time period.

The following activities took place to support the achievement of output 3:

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:
Building B.E.A.C.O.N.S of hope: Elephants Alive constructed southern Mozambique's first HEC watch tower in Namaacha Valley. These towers, called B.E.A.C.O.N.s (Building Elephant & Agricultural Community Observation Networks), are educational and practical hubs. They offer a symbolic elevation of community members above their problems, providing a bird's eye view of the issues. Practically, the tower functions as a storeroom, honey processing facility, and observation platform. Educational posters from the STE HEC toolbox manual and translated in Portuguese line the wind shielded part of the tower. Community members are provided with powerful flashlights for night vigilance over crops which are charged from solar panels. In addition, a relevant person has been appointed at each tower to report to Tinyiko Masia (Community Projects Manager of Elephants Alive) via a provided cell phone (also charged with solar electricity) with financed airtime. The towers are positioned strategically for good cell reception, and in an elevated position so the flashlights can reach a maximum distance for crop protection.

The first watch tower was built at the Mswazi community in October 2023 and is used on a near-daily basis. At this site, the tower has proved invaluable during the growing season. With reference to Figure 4, plot 2, the crops closest to the tower that were initially protected with soft barriers did not receive as many elephant entrances as the rectangle to the north of the tower that was later added (November-December 2024).

The second tower was completed in the Gumbe community in July 2024. The designs of each of these towers differed. Using a container as the based (as with the Gumbe community) proved to be more efficient both in terms of cost and construction time. However, the quality of the lock of the door has proven to be poor with the key breaking off in the door. This needs to be fixed so that the spotlight can be charged. However, elephant visitations to the Gumbe site have been negligible so the additional need for spotlights have not been expressed as a pressing need by the community.

One more B.E.A.C.O.N. will be erected in the Namaacha valley. The roads have dried out and the relevant community members have already pruned the vegetation on the side of the road so that the truck can deliver the container needed. Thus far there have been six meetings held at the towers since their erection. We have not yet used the towers for honey production as the bees usually take 1-2 year to increase their occupancy of new hives. The tower at Mswazi has worked well as a storeroom for mitigation equipment.

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.
In April 2025, the MWA team, in collaboration with a partner organization, conducted a workshop to finalize and launch a social survey focused on areas supported by our response and resilience infrastructure, including RRUs and protected farming communities (e.g., those with electric fencing). Planned since August 2024, the survey has now entered its field implementation phase. Although it is too early to draw conclusions or identify trends, we anticipate having sufficient data by the Year 3 final report to generate meaningful insights and assess outcomes.

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:
As part of our ongoing efforts to build local capacity and encourage cross-border collaboration, one exchange programme per year is being implemented between South Africa and Mozambique. These exchanges focus on transferring practical skills related to human-elephant conflict mitigation, including the cultivation of unpalatable crops and the use of beekeeping as a deterrent strategy.

In connection with this activity, Franziska Steinbruch, a PhD student and now a doctoral researcher at Wageningen University, is contributing to the project through her work on predictive models and digital twin systems for mitigating crop-raiding by elephants. Her research is directly informed by the exchange programme and supports the development of community-responsive early warning tools.

Additionally, community field surveys conducted by a social scientist will adhere to non-medical human ethics guidelines. These surveys will take place in Years 1 and 3, with a focus on analysing patterns of natural resource use, to ensure that intervention strategies are grounded in the socio-economic realities of local communities.

The following activities took place to support the achievement of output 4:

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.

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: seven hives active and four absconded and haven't been reoccupied over the dry season. For Gumbe community: seven installed and four have been occupied since the last report.

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.

The following activities took place to support the achievement of output 5:

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.

Project funds will be used to implement an additional carbon plot survey in Year 3. Currently, a team of five local individuals are conducting carbon plot surveys in South Africa to assess how savanna elephants influence biodiversity, carbon stocks, and net primary productivity (NPP). These surveys form part of a broader effort to establish a network of Global Ecosystem Monitoring (GEM) and biodiversity monitoring sites across Southern Africa. This network will generate robust empirical data on the role of elephants in shaping carbon dynamics and structuring biodiversity. The findings will contribute to more accurate climate modelling and inform conservation policies that support both biodiversity and climate resilience.

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:
As we begin Year 3 of the project, we are initiating efforts to organise strategic meetings and develop Memoranda of Agreement (MOAs) with key partner organisations. These partnerships are essential for aligning objectives, strengthening cross-institutional collaboration, and ensuring long-term sustainability of project outcomes.

5.4 Strategic fundraising endeavours for additional sources of income starting in Year 2 but secured by Year 3: MWA have secured ___GBP until the end of Year 3 whereas EA has secured close to ___GBP for the same period. Elephants Alive had secured funding from the U.S. Fish and Wildlife Service (USFWS). This support was instrumental in enabling us to expand our impact, strengthen regional connectivity, and implement community-driven solutions to mitigate human-elephant conflict. However, we report the loss of this USFWS funding. This development represents a significant challenge for the organisation, the communities we work with, and the elephants whose long-term survival depends on the continuity of this work. The funding provided a critical lifeline, supporting key elements of our science-based, community-led approach to conservation.

While this setback is deeply disappointing, our commitment remains unwavering. We continue to explore new funding avenues to upscale the Darwin Main Project and ensure that our work across the Mozambique–South Africa border region remains impactful. A number of large grant applications have been submitted, and we hope these are awarded beyond Year 3 of the Darwin Grant. We are actively seeking new partnerships and financial support to maintain momentum, protect biodiversity, and foster human-elephant coexistence across this vital landscape.

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): Not applicable for this reporting period

3.2: Progress Towards Project Outputs

The project continues to make robust progress towards achieving its intended Outputs, as set out in the approved logical framework. The activities undertaken across Years 1 and 2 have laid a strong foundation, and the project remains on track to deliver all Outputs by the end of Year 3. This section provides a detailed account of progress for each Output, outlining the baseline conditions, the changes observed to date, the indicators as listed in the logical framework, how these indicators are being measured, and the sources of evidence - linked to specific activity numbers:

Output 1: Further understanding of the motivation behind elephant movements from core conservation areas into peripheral PAs, as well as their crop-raiding strategies (Phase 1):
At project inception, there was limited data on elephant movement across the targeted corridors, minimal understanding of the drivers of crop-raiding behaviour, and no available physiological stress data for elephants in the region. To address this gap, 20 elephant collars were deployed over the first two years of the project, with a 21st collar deployed at the start of Year 3 (Activity 1.1). Using time-density modelling, these data were used to delineate home ranges and identify key movement corridors, including a transboundary path linking Kruger National Park (South Africa), Mozambique, and KwaZulu-Natal Province (Activity 1.2). The Human-Elephant Conflict (HEC) risk model was refined to assess risk across the broader elephant population, not just the collared subset, and now incorporates nutrient availability as a predictor of crop-raiding (Activity 1.3). Field sampling of faecal glucocorticoids continues in SA as baseline (Activity 1.4). Indicators 1.1 to 1.4 include the number of elephants collared (target: 35), monthly mapping of movement and crop-raiding hotspots, identification of key plant species driving movement or he

microminerals needed and associated with their distribution, and comparative hormone analysis to a Kruger baseline. Evidence sources: Activities 1.1 to 1.4.

Output 2: Ensuring human and elephant safety with the establishment and deployment of an additional Rapid Response Unit (RRU) and ensuring the protection of human assets through the establishment of non-income generating barriers (Phase 2): Before project implementation, there was a recorded baseline of 76% RRU success rate in crop protection, low community training levels, and seven elephant-related human fatalities. In response, four RRUs were deployed with enhanced mobility and GPS tracking (Activity 2.1). A total of 274 HEC reports and 334 responses were recorded across the two-year period, with an increase in responses and spatial coverage during Year 2 (Activity 2.3). Human fatalities have decreased to one while another person was injured. Twelve workshops trained 420 participants (276 men, 144 women) (Activity 2.2). Non-income generating mitigation plots - five electric fences and three soft barriers—were monitored and evaluated for effectiveness (Activity 2.4). Indicators 2.1 to 2.4 track the RRU response success rate (target: 80%), number of people trained annually (target: 250), absence of human fatalities, and the establishment and community adoption of mitigation barriers. Evidence sources: Activities 2.1 to 2.4.

Output 3: Training and capacity building in sustainable and gender-equitable non-income and income-generating HEC mitigation opportunities promoted at watch towers as discussion sub-centres, whilst facilitating the understanding of the socio-economic needs of affected communities and their attitudes towards wildlife (Phase 3): At baseline, no watch towers or exchange programmes were present and female participation in HEC mitigation was low. In response, two B.E.A.C.O.N. towers were constructed in Mswazi and Gumbe (Activity 3.1), serving as community hubs. Six meetings were held to date. Community surveys focusing on gender and resource use were conducted in Year 1, with more planned for Year 3 (Activity 3.2). Cross-border exchange programmes were initiated, with Franziska Steinbruch (Wageningen University) contributing digital twin research based on these exchanges (Activity 3.3). Indicators 3.1 to 3.3 assess increased household participation, 80% increase in female involvement, and 20% reduction in resource use coupled with a 40% increase in alternative crop planting. Evidence sources: Activities 3.1 to 3.3.

Output 4: Establishment and development of income generating barriers within the corridor (beehive fences and elephant unpalatable crop types with a market value) (Phase 4): At project start, income-generating mitigation strategies were not in place. Since then, a mix of beehive and crop-based barriers have been deployed across 3 study sites (Activity 4.1). GPS tracking and harvest reports show reduced crop damage, particularly during the rainy season (Activity 4.2). Monthly beehive monitoring in Mswazi showed 64% occupancy while Gumbe occupancy has increased to 57% (Activity 4.5). Additional surveys on adoption and economic impacts are scheduled for Year 3 (Activities 4.3, 4.4, 4.6). Indicators 4.1 to 4.6 monitor barrier effectiveness, 40% reduction in crop-raiding, community adoption (target: 25%), 30% beehive occupancy, and use of honey-based products on 20% of farms. Evidence sources: Activities 4.1 to 4.6.

Output 5: Increased knowledge and research on human-elephant coexistence and ecological connectivity at local and national level. Successful models (post-application period) are replicated to upscale solving HEC at landscape level resulting in the establishment of biosphere reserves and reforestation schemes with functioning as vegetation steppingstones for elephant using the corridors: Initially, no frameworks existed for integrating biodiversity into local policy. The project addressed this by launching carbon plot surveys (Activity 5.1), with another scheduled for Year 3. Two scientific papers were prepared: one accepted by the Journal of Applied Ecology (Activity 5.2). MOAs with strategic organisations are under development (Activity 5.3), and fundraising efforts are in progress to secure £600,000 in matched funding (Activity 5.4). Preparations for policy workshops to support gazettement of Biosphere Reserves are scheduled for Year 3 (Activity 5.5). Indicators 5.1 to 5.5 track community understanding of biodiversity values, peer-reviewed outputs, partnerships formed, funds secured, and legislative engagement. Evidence sources: Activities 5.1 to 5.5.

3.3 Progress towards the project Outcome

The project has made substantial progress towards its intended Outcome: Elephant crop losses significantly reduced, perceptions towards elephants improved and retaliatory killings reduced. Sustainable HEC mitigation strategies, facilitating financial resilience, are adopted by communities living alongside a recognized wildlife corridor. Established models are replicated and upscaled to landscape level, leading to land reform and biosphere reserves (post-project period). The Outcome is measured against eleven specific indicators, detailed below:

Indicator 0.1: A 40% reduction in crop losses from elephants is being approached. Reports and spatial data show that communities using mitigation tools such as beehive fences, electric fencing, and soft barriers are experiencing improved harvest outcomes. Final Year 3 harvest monitoring will confirm overall reduction.

Indicator 0.2: Surveys indicate early signs of increased household earnings due o he implementation of mitigation initiatives. Full evaluation of >10% increase to be completed via income surveys in Year 3.

Indicator 0.3: Please see annex 4 for detailed information on elephant mortalities throughout the project period.

Indicator 0.4: Earth Ranger and district-level data show a reduction from 128 HEC reports in Year 1 to 89 in Year 2. This represents a 30% reduction, nearing the target of 40%, with more reductions anticipated following expanded mitigation deployments.

Indicator 0.5: Food production has increased in protected plots, with monitoring data showing improved yields in demonstration areas. Full comparison with Year 1 baseline is scheduled post-harvest in Year 3 to confirm a 20% increase.

Indicator 0.6: Elephant collar data and community observations confirm increased corridor use, including breeding herds. This is a significant improvement from a baseline of zero, and analysis is underway to quantify a 30% increase.

Indicator 0.7: Over 10% of community members trained are actively applying new mitigation strategies such as beekeeping and unpalatable crops. Adoption tracking will continue in Year 3, but this indicator is on track.

Indicator 0.8: Uptake of communal farming for unpalatable crops has begun. Field data show progress toward the 20% of farms threshold, with larger-scale adoption expected as growing seasons proceed and market access is supported.

Indicator 0.9: Tower dialogues, training sessions, and exchange programmes have improved community understanding of biodiversity. Survey comparisons from Year 1 to Year 3 will assess shifts in knowledge and values to provide feedback in the final year reporting period.

Indicator 0.10: Preparatory policy engagement is underway with district stakeholders. Corridor data has been shared, and land-use recognition of biodiversity needs is a focus for Year 3 policy workshops.

Indicator 0.11: Baseline data show high gender disparity, but with 144 women trained, female participation is rising. Year 3 follow-up surveys will determine if the Gender Inequality Index has improved beyond the national average of 0.54.

3.4 Monitoring of assumptions

Monitoring the Outcome and Output-level assumptions outlined in the project's logical framework is essential for ensuring effective implementation and adaptive management. Below is a detailed review of each assumption and its current validity, based on progress and observations made during project implementation to date.

Outcome-Level Assumptions
Assumption: All mitigation methods are effective if applied and maintained correctly. Elephants do not become habituated to methods. **Status**: At this stage of the project, this assumption largely remains valid although regular maintenance of soft barriers is required more often, and theft of flashing lights needs to be addressed.

Assumption: Viable market for income generating crops/products, particularly the essential oil market, local and international. **Status:** At this stage of the project, this assumption remains valid and has been tested only in South Africa.

Assumption: HEC incidents are reported accurately. **Status**: At this stage of the project, this assumption remains valid.

Assumption: Elephant collars remain active for the study period without malfunctioning or dropping off. **Status**: At this stage of the project, this assumption remains valid. There has been a temporary issue with one of the collars that was implemented while two malfunctioned.

Assumption: Crop protection efforts, upskilling, training opportunities and near immediate support from the RRUs are effective in fostering tolerance towards elephants. **Status**: At this stage of the project, this assumption remains valid. Preliminary training sessions have facilitated the knowledge of the local communities on the mitigation methods, enhancing a tolerance towards elephants. Workshops provide a constructive platform to initiate dialogue around complex, often sensitive topics such as Human-Wildlife Conflict (HWC), and in particular HEC, which can be politically and socially divisive. They serve as an effective means to engage communities, identify motivated and proactive local champions, and gain a deeper understanding of the underlying drivers behind a community's responses - whether that be action, inaction, retaliation, resentment, or support. Beyond capacity building, workshops create a neutral space for collaboration and co-creation, laying the foundation for mutual understanding and progress toward coexistence and tolerance.

Assumption: Increased tolerance towards elephants facilitates the approval of establishing a wildlife corridor amongst the communities & within government. **Status**: The project is not advanced enough to determine if this assumption remains valid.

Assumption: Other motives for elephant killing (i.e., poaching) do not override tolerance efforts. **Status**: At this stage of the project, this assumption remains valid.

Assumption: Political interference does not negatively affect communities' support for corridor conservation. **Status**: The project is not advanced enough to determine if this assumption remains valid.

Assumption: Collared and non-collared elephants, including herds, utilise the established corridors. **Status**: We will continue to monitor these collared elephant movements to determine this.

Assumption: The project site's Gender Inequality Index is above that of the national average. **Status**: At this stage of the project, this assumption remains valid.

Output-Level Assumptions

Output 1:
Assumption: Elephants of a particular sex and age group will be found in the optimal location for collaring and research purposes. **Status**: At this stage of the project, this assumption remains valid.

Assumption: The collars remain active for the study period without malfunctioning, individuals dying or illegally killed. **Status**: At this stage of the project, this assumption largely remains valid.

Assumption: Partner organisations remain committed and able to support collaring operations and data analyses. **Status**: At this stage of the project, this assumption remains valid.

Output 2:
Assumption: Additional funding is acquired to equip another RRU to ensure all impacted communities feel supported and integrated into the RRU deployment plans. **Status**: At this stage of the project, this assumption remains valid.

Assumption: An additional RRU can provide further HEC relief along the corridor. **Status**: At this stage of the project, this assumption remains valid.

Assumption: Communication channels for reporting HEC remain operational and available throughout the corridor via already-established platforms. **Status**: At this stage of the project, this assumption remains valid.

Assumption: The RRUs continue to train the District Services of Economic Activities (SDAE) on HEC mitigation strategies to ensure a successful handover of responsibility once long-term mitigation strategies have been implemented. **Status**: At this stage of the project, this assumption remains valid.

Assumption: Each mitigation method is applied and maintained properly. **Status**: At this stage of the project, this assumption remains valid except for the flashing lights. Where chili rags have required too much maintenance, some community members have come up with innovative alternatives using the same materials. The project progression will continue to help to determine this.

Output 3:
Assumption: Keen interest in upskilling opportunities from the community. **Status**: At this stage of the project, this assumption remains valid. Preliminary social research methods have shown that there is a willingness to engage with the educational aspects of the project.
Assumption: Socially acceptable for women to gain new skills and generate their own income.
Status: At this stage of the project, this assumption remains valid.
Assumption: Continued efficacy of income and non-income generating HEC mitigation methods.
Status: At this stage of the project, this assumption remains valid.
Assumption: All new agricultural endeavours follow sustainable practices that do not result in increased biodiversity loss or degradation. **Status**: At this stage of the project, this assumption remains valid.
Assumption: Increased financial security will decrease dependency on natural resource use.
Status: At this stage of the project, this assumption remains valid.
Assumption: Watch towers prove to become knowledge and discussion sub centres where communities from outside the corridor visit and learn from. **Status**: At this stage of the project, this assumption remains valid. This has already started to become apparent at this stage.

Output 4:
Assumption: Each mitigation method is applied and maintained properly. **Status**: At this stage of the project, this assumption remains valid.
Assumption: Following comprehensive beekeeping training and set-up of a monitoring system, the beehive fence will be maintained. **Status**: At this stage of the project, this assumption remains valid. There is already an excitement around the beehive, and an eagerness to learn from the communities.
Assumption: Bee colonies have enough available resources to prevent colonies absconding from hives. **Status**: At this stage of the project, this assumption remains valid. This will become apparent in October (seasonal dependence)
Assumption: Essential oil crops are not negatively impacted by environmental conditions (i.e., drought). **Status**: At this stage of the project, this assumption remains valid at our proof of project site in SA.
Assumption: Communities are open to alternative crop production and willing to apply mitigation strategies to prevent crop-raiding. **Status**: At this stage of the project, this assumption remains valid.
Assumption: An interest from local and international markets for produced-essential oils and/or honey-related items. Knowledge and skill transfer from Proof-of-Concept Projects established in South Africa. **Status**: At this stage of the project, this assumption remains valid.

Output 5
Assumption: Outputs 1 - 4 lead to greater understanding of ecological connectivity and increased tolerance towards elephants. **Status**: At this stage of the project, this assumption remains valid.
Assumption: Academic interest in project results and the model can be replicated elsewhere.
Status: At this stage of the project, this assumption remains valid. This will become apparent in the latter stages of the project.
Assumption: Funding bodies understand the worth of the project and find value in the replication of the model. **Status**: At this stage of the project, this assumption remains valid. This will become apparent in the latter stages of the project.
Assumption: Governmental agencies promote and support biodiversity objectives and are prepared to review current legislation and policies. **Status**: At this stage of the project, this assumption remains valid. This will become apparent in the latter stages of the project.

3.5 Impact: achievement of positive impact on biodiversity and multidimensional poverty reduction

The intended impact of the project, as articulated in the original application, is to contribute to long-term biodiversity conservation and multidimensional poverty reduction. The project's integrated approach—addressing Human-Elephant Conflict (HEC), promoting community-based mitigation, and supporting land-use planning—aligns with the Darwin Initiative's broader objectives. This section describes the project's contributions to these two impact areas and the potential for scale-up.

Contribution to Biodiversity Conservation

The project aims to mitigate Human-Elephant Conflict (HEC) through short-term and long-term strategies that enhance both human and elephant safety. In the short term, real-time HEC mitigation reduces negative encounters, modifies crop-raiding behaviour, and builds community tolerance. In the long term, linking Protected Areas (PAs) through community-supported corridors enhances ecological connectivity, promotes genetic transfer, and supports phenotypic traits such as large tusks.

Short-term achievements include increased transboundary movement of up to 35 elephants between PAs, reduced hostility due to fewer conflict incidents, and behavioural change among elephants encouraged through deterrents. This has decreased the burden on wildlife authorities and increased community buy-in.

Long-term contributions include reduced stress-related behaviour among elephants, evidenced by faecal hormone sampling, and use of the corridor by herds—not just bulls—indicating perceived safety. Movement between previously isolated habitats allows for seasonal recovery and biodiversity regeneration. The corridor connects two Transfrontier Conservation Areas across borders and up to 10 PAs, supporting landscape-level conservation and maintaining 'institutional knowledge' among elephants regarding safe routes.

Designating the community corridor as an OECM decreases deforestation and increases effective PA coverage. It also enables biodiversity-friendly land-use planning and strengthens ecosystem resilience. The project's scale-up strategy includes embedding this network of collared-elephant corridors into a cross-border Biosphere Reserve, fostering resilience and conservation outcomes.

Contribution to Poverty Reduction

The project addresses poverty in a region with over 138,000 residents across six districts frequented by corridor-moving elephants. It combines short-term and long-term interventions to improve food security, livelihood resilience, and gender empowerment.

Short-term actions include beehive fence installation to reduce crop loss and enhance crop yields via pollination services. These interventions directly reduce food insecurity and build household resilience. Real-time RRU support and training also contribute to community safety and awareness.

Long-term strategies introduce income-generating crops and promote wildlife-compatible tourism. These efforts diversify income sources and reduce dependency on natural resource extraction. Women are being empowered through targeted training, positioning them as decision-makers and conservation ambassadors.

The project's scale-up model includes establishing discussion sub-centres/watchtowers as platforms for learning and replication. These hubs facilitate knowledge transfer to NGOs and local leaders. Women are central to this strategy, acting as social role models who pass on coexistence values and conservation knowledge to future generation (see section 5).

4 Project support to the Conventions, Treaties or Agreements

National Strategy and Action Plan of Biological Diversity of Mozambique (2015-2035) (NBSAP)
Contributing to all four of the strategic goals by reducing the causes of biodiversity loss/degradation, protecting biodiversity, improving benefit-sharing and participation amongst citizens.

Strategy and Action Plan for the Conservation and Management of Elephants in Mozambique 2010-2015
Conserving free-roaming elephants and their habitats whilst ensuring economic development for co-existing communities.

African Convention on the Conservation of Nature and Natural Resources
Protecting natural resources to ensure the well-being of the Mozambican population.

Framework Convention on Climate Change:
Facilitating the development of a healthier ecosystem which can act as a carbon sink.

National Ivory and Rhino Action Plan (NIRAP) 2020-2022 (CITES):
Contributing to awareness of the importance of elephants within an ecosystem whilst highlighting the socio-economic costs of poaching.

CBD
8 & 10 – Implementation of human-elephant-coexistence management incorporates both community HEC practices and considers biodiversity in decision making.

12 – Training of RRUs, women and community members in HEC mitigation and alternative income sources.

13 – Promoting biodiversity conservation through media and educational programmes.

CITES
African elephants in Mozambique are classified as Appendix I. This project promotes human tolerance of and protection over elephants. Mozambique is also part of the CITES Mike Programme which aims to provide objective information on illegal elephant killings.

CMS
African elephants are a migratory species covered by CMS. This project aims to facilitate safe passage for transboundary migratory.

Sustainable Development Goals (SGBs)
The conservation impact will contribute to three of the SGSs:

By protecting, restoring and promoting sustainable use of terrestrial ecosystems Life on land is improved and, in the process, Clean Water and Sanitation as well as Climate Change will be buffered against because of the socio-economic support and reforestation activities of people sharing the elephant corridor.

The social impact will contribute to nine of the SGBs:

No poverty; Zero Hunger; Good Health and Wellbeing; Gender Equality; Decent work and Economic Growth; Reduced Inequalities due to sustainable livelihoods; Responsible Consumption and Production, Peace, Justice and Strong Institutions will be realized due to the strong Partnerships for the Goals.

MoU between South Africa and Mozambique in the field of Biodiversity, Conservation and Management:
Promote increased cooperation for the management of transboundary protected areas.

Lubombo Transfrontier Conservation Area (LTFCA) agreement between South Africa, Mozambique and Eswatini:
Linking the Great Limpopo Transfrontier Conservation Area to the LTFCA increases the potential for socio-economic upliftment whilst improving regional ecosystems management.

BIODEV2030 project:
Integrating biodiversity conservation considerations into economic sectors

5   Project support for multidimensional poverty reduction

The project contributes meaningfully to multidimensional poverty reduction in southern Mozambique, where corridor-traversing elephants interact daily with vulnerable rural communities. Spanning six districts and impacting over 138,000 people across 36,707 km², the project area is characterised by widespread subsistence agriculture, limited infrastructure, and high exposure to human-elephant conflict (HEC). In this context, poverty manifests through food insecurity, income instability, safety risks, and constrained livelihood options—challenges that the project directly addresses through integrated, community-led conservation and development interventions.

At the core of the project's poverty reduction strategy is the principle of coexistence—supporting communities to live safely alongside elephants while enhancing their capacity to manage risk, secure livelihoods, and benefit from ecosystem services. During the first two years of implementation, the project has made progress across several dimensions of poverty reduction.

Food security and resilience have improved through the establishment of beehive fences, soft barriers, and electric fences that have effectively reduced crop losses from elephant incursions. These mitigation strategies not only protect harvests but, in the case of beehives, actively enhance crop yields through pollination. Communities participating in these interventions have reported more stable food production, a key factor in reducing hunger and increasing household resilience. Monitoring data from demonstration plots indicate this trend will likely continue as barrier maintenance and crop protection techniques become more widely adopted.

The project also targets income generation and livelihood diversification by promoting the cultivation of unpalatable, marketable crops and supporting local honey production. While long-term economic outcomes will be fully assessed in Year 3, early adoption and enthusiasm signal that these efforts are laying the foundation for improved financial security. Notably, the deployment of four Rapid Response Units (RRUs), supported by GPS tracking and local reporting systems, has ensured timely conflict mitigation and reduced trauma and asset loss in affected communities.

The project is also contributing to gender empowerment, a critical pathway out of poverty. Of the 420 individuals trained in HEC mitigation and alternative livelihood strategies, 144 are women. Social surveys conducted in Year 1 revealed strong interest from women in acquiring new skills and playing an active role in household and community decision-making. The B.E.A.C.O.N. towers serve as inclusive spaces for training, discussion, and collaboration, supporting women's leadership and peer-to-peer knowledge sharing. The longer-term goal of reducing the Gender Inequality Index in the project site below the national average remains a focus for Year 3 assessments.

Crucially, the project is designed not only for immediate impact, but for sustainable, scalable poverty reduction. By embedding mitigation techniques and livelihood innovations into community structures and building institutional capacity among local authorities, the project ensures that gains can be maintained and replicated beyond the grant period. Planned activities in Year 3—including the development of watchtower-based knowledge hubs, corridor policy dialogues, and post-project scale-up strategies—will further entrench the conditions needed for long-term poverty alleviation.

In sum, the project is addressing several interrelated drivers of poverty—food insecurity, unsafe living conditions, lack of income opportunities, and exclusion from planning processes—through a practical, community-focused approach. The early results indicate that the project is not only helping people coexist with elephants, but also enabling them to lead safer, more resilient, and more empowered lives.

6   Gender Equality and Social Inclusion (GESI)

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered, and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups, and the project will not contribute to or create further inequalities.	X
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

* We are proud of the fact that many females are delivering on the project both at the farmer level and at the managerial level. We are thus empowering women and addressing gender equality and welcome further discussions with the Darwin Initiative on this.

While we initially self-assessed our contribution to Gender Equality and Social Inclusion (GESI) as "Not yet sensitive," external reviewers have recognised the project as meeting the "Sensitive" criteria, with potential to move toward "Empowering" as we deepen our engagement.

We have designed and implemented the project with a strong awareness of the GESI context in southern Mozambique. From the outset, we ensured women were central to our approach—training them in beekeeping, permaculture, and medicinal plant cultivation. These practical skills not only support our conservation goals but also position women for broader leadership in agricultural extension. Currently, women make up 83% of our Project Board, and 75% of our delivery partners are either women-led or have gender-balanced leadership.

In line with GESI principles:

- We've adapted training schedules and locations to fit with women's daily responsibilities and ensured that resources and starter kits are equitably distributed.

- Women are consistently included in community meetings and exchange visits, with many now acting as role models for others.

- We are seeing gradual shifts in community attitudes, where women's involvement in conservation and income generation is increasingly accepted.

- Our interventions—particularly those that improve food security and reduce conflict—are helping to reduce vulnerability among women-headed households.

We also recognise that gender interacts with other social identities. Our engagement reflects this by adapting training and communication methods for different age groups, literacy levels, and social roles. We will expand this further in Year 3, with a particular focus on improving inclusion for people with disabilities.

One key lesson we've learned is the importance of continued mentoring and visibility. When women see their peers succeeding, they are more likely to participate actively and take on leadership roles. As we move forward, we plan to increase our tracking of women's influence in decision-making spaces and strengthen our partnerships with local women-led organisations.

We believe that with sustained effort, we are well-positioned to shift from GESI-sensitive to GESI-empowering in the final stages of the project.

7   Monitoring and evaluation

This year, we employed a range of systems and tools to monitor and evaluate progress, ensuring that project activities and outputs are meaningfully contributing to our intended Outcome. We adopted a combination of Outcome Mapping, Theory of Change modelling, and a structured M&E framework to link project activities to measurable results.

Through outcome mapping, we defined the changes we aim to achieve and traced the outputs and activities contributing to each. A Theory of Change model—currently under development—visually outlines the pathways from project inputs to impacts and will be finalised by the project's end. These approaches, combined with our logical framework and SMART indicators, provide a strong foundation for measuring progress.

Our M&E approach includes both quantitative and qualitative indicators, such as:
- Number of women trained, increase in household income, and improved crop yields
- Empowerment indicators (e.g., leadership roles, decision-making autonomy)
- Community resilience and knowledge transfer

Data is collected through surveys, focus groups, observation, and field logs. For example, crop yields and income levels are measured through pre- and post-intervention surveys, while qualitative insights are gathered during community meetings and workshops.

We use shared templates and cloud-based systems to consolidate partner input and hold regular coordination meetings to review findings. M&E responsibilities are shared across partners, with each contributing based on their expertise. This collaborative model supports joint ownership, learning, and adaptation.

We have made some adjustments to the M&E plan over the year. For instance, delays in elephant collaring due to adverse weather affected the Year 1 baseline. We remain committed to completing the collaring targets by the end of the project and have adapted timelines accordingly.

Overall, the M&E system is functioning well. It allows us to triangulate data, track indicators effectively, and adapt implementation strategies based on evidence and feedback. Our collaborative, multi-method approach ensures that M&E is not only a reporting tool but also a foundation for learning, accountability, and impact.

8   Lessons learnt

This past year provided several important lessons that have strengthened our approach and will inform how we adapt in Year 3. Learning has occurred across all levels of the project—from technical operations to community engagement and partnership coordination. These lessons are contributing to continuous improvement and guiding our future planning.

- **What Worked Well**

Community Engagement:
Engagement with local communities has been a key strength of the project. Through trust-building initiatives such as B.E.A.C.O.N. towers and village meetings, we have successfully

fostered collaboration and increased local ownership. Communities have responded positively to awareness campaigns on human-elephant conflict (HEC) mitigation, which have improved understanding and supported adoption of coexistence strategies.

Skill Development:
Training in beekeeping, permaculture, and medicinal plant cultivation has been particularly effective. These programmes were well-received and have equipped participants—especially women—with tangible skills that contribute both to HEC mitigation and alternative income generation.

Data Collection and Monitoring:
Elephant collaring (despite delays), movement tracking, and social surveys have provided valuable data. These insights are improving our understanding of elephant behaviour and community perceptions and informing ongoing refinement of digital risk models and conflict prevention efforts.

Partnership Building:
Collaboration with NGOs, academic institutions, and government agencies has been instrumental in extending the reach of the project and enabling resource-sharing. Joint monitoring and information-sharing mechanisms have supported coordinated delivery and adaptive management.

- **What Didn't Work as Well**

Weather-Related Delays:
Unforeseen weather conditions affected planned activities—particularly elephant collaring—resulting in timeline delays. While such events are outside our control, they highlighted the need for greater operational flexibility.
Solution: We are developing contingency plans for weather-sensitive activities, including alternative collaring windows and locations, and more flexible scheduling within seasonal constraints.

Logistical Constraints:
Challenges with transportation and equipment procurement occasionally disrupted field activities and slowed data collection due to political instability with governmental elections. In remote regions, these issues also affected the speed of response during HEC incidents.
Solution: We are improving logistical planning by investing in field coordination capacity, consolidating procurement timelines, and ensuring clearer communication between central and field teams.

Political Instability:
Emerging political uncertainty and leadership transitions at the district level have, in some areas, delayed partner coordination and slowed policy engagement processes.
Solution: We are actively managing this by maintaining regular dialogue with local officials, diversifying points of contact, and documenting support through written agreements (e.g., MOAs) where possible to minimise disruption.

We are already integrating these lessons into our Year 3 planning. Additional logistical capacity is being developed, a stronger emphasis on equipment maintenance is underway, and we are increasing engagement with district officials to safeguard policy-related activities against political uncertainty.

At this stage, we do not anticipate needing to submit a Change Request, as the necessary adaptations are achievable within the current project structure and budget. However, we remain open to realignment if circumstances change.

9 Actions taken in response to previous reviews (if applicable)

We have carefully reviewed and addressed the feedback received following last year's Annual Report and are pleased to report several concrete improvements in response to the reviewer's recommendations:

Progress reporting against output-level indicators:
In response to feedback requesting clearer reporting on progress toward measurable indicators, this year's Annual Report now includes a detailed narrative aligned with each project Output. We have also ensured all measurable indicators from the logical framework are explicitly referenced and evidenced throughout Section 3.2. This enhances transparency and accountability in tracking project progress.

Completion of required annexes:
We have fully completed Annexes 1 and 2 within the official reporting template, providing a comprehensive update on project status and risk management. These annexes reflect the current state of implementation, learning, and adaptations.

Improved GESI reporting:
Last year's review noted that while we had self-assessed our GESI contribution as "Not yet sensitive," our activities reflected a more meaningful level of engagement. This year, we have revisited that assessment and provided a clearer, evidence-based GESI narrative. We now report the project at the "Sensitive" level, with a pathway toward "Empowering" as women's participation, leadership, and livelihood development continue to grow across the corridor.

Monitoring and Evaluation enhancements:
We have improved our internal M&E processes by strengthening the link between outputs and outcomes using Outcome Mapping. This tool has been integrated into our planning and reporting processes. We also expanded the use of SMART indicators and clarified our approach to measuring both qualitative and quantitative results, including gender-disaggregated data collection and participatory feedback mechanisms.

All project partners contributed to these improvements and have welcomed the clearer structure and increased visibility of outcomes within the report. No further OSJA conditions apply to the project, and all initial funding approval recommendations have been addressed through reporting or ongoing implementation.

We remain committed to building on these improvements in the final year of the project and thank the reviewers for their valuable guidance.

10 Risk Management

For further details, please refer to the updated risk register in the file.

11 Scalability and durability

Sustainability and long-term impact have been central to our project strategy, focusing on both scalability of the model and durability of outcomes beyond the project period.

Stakeholder engagement and adoption:
Community members, government partners, and NGOs have been actively engaged through training, exchange visits, and tower-based outreach. The benefits of interventions—such as improved crop security, income from and reduced HEC—are clearly visible, and adoption is growing. Positive feedback and uptake suggest the model is attractive and replicable.

Institutional support and policy alignment:
We are aligning project outcomes with government priorities in conservation and land-use planning. Discussions are ongoing around corridor recognition and OECM designation, with

policy workshops scheduled for Year 3. MOAs are also being developed to support long-term ownership by partners.

Behaviour and attitude shifts:
Survey data and community feedback show increasing tolerance towards elephants, greater awareness of HEC solutions, and rising female participation in training and leadership. These shifts are key to sustaining coexistence behaviours and social change.

Exit strategy progress:
We have advanced core elements of our exit plan, including local capacity-building, digital conservation tools (e.g. the digital twin), and sustainable livelihoods. RRUs, shepherd models, and community towers will continue to serve as local entry points for ongoing implementation.

Looking forward:
To support long-term legacy, we are continuing to build governance structures, reinforce women's roles, and improve data access for future planning. The project is well-positioned for both continuity and replication.

12 Darwin Initiative identity

The project has made concerted efforts to publicise the Darwin Initiative, showcasing its support and promoting funding opportunities and projects through various channels.

1. **Project website and materials**: The Darwin Initiative logo and information about the funding support received are prominently featured on the project's website and promotional materials. This includes project brochures, leaflets, and presentations distributed to stakeholders, partners, and interested parties.
2. **Social media campaigns**: The project leverages social media platforms such as Twitter, Facebook, and LinkedIn to raise awareness about the Darwin Initiative and highlight its contributions to biodiversity conservation and sustainable development. Posts, updates, and multimedia content showcase the project's achievements and impact, with acknowledgment of the Darwin Initiative's support.
3. **Participation in Darwin Initiative events**: The project actively participates in Darwin Initiative events, workshops, and conferences to share experiences, lessons learned, and best practices with the wider conservation community. This includes training events which Dr Katie Thompson participated in such as the M&E indicator development. These events serve as platforms to promote the Darwin Initiative's funding opportunities and showcase successful projects.
4. **Collaborative partnerships**: Collaborations with other Darwin Initiative-funded projects and partners facilitate mutual support and knowledge exchange. Joint initiatives, co-authored publications, and shared resources amplify the impact of Darwin-funded projects and promote the initiative's objectives, which is an activity we are currently working on.
5. **Networking and outreach**: The project engages in networking activities and outreach efforts to connect with potential partners, donors, and stakeholders interested in biodiversity conservation and sustainable development. Participation in relevant forums, working groups, and conservation networks helps raise awareness of the Darwin Initiative's work and funding opportunities.

13 Safeguarding

14 Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2024 – 31 March 2025)

Project spend (indicative since last Annual Report	2024/25 Grant (£)	2024/25 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL	**168174.59**	164599.4		

Table 2: Project mobilised or matched funding during the reporting period (1 April 2024 – 31 March 2025)

	Secured to date	Expected by end of project	Sources
Matched funding leveraged by the partners to deliver the project (£)	EA EA MWA MWA MWA MWA MWA		OAK Foundation USFWS before the funding freeze JAMMA Foundation OAK Foundation Radiance TOTAL SCIF
Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)	EA EA MWA MWA MWA MWA MWA		CBC AEF PTES CFHF IEF GFCF AEF

15 Other comments on progress not covered elsewhere

N/A

16 OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes.

I agree for the Biodiversity Challenge Funds to edit and use the following for various promotional purposes (please leave this line in to indicate your agreement to use any material you provide here).

Evidence of improved livelihood outcomes attributable to the implementation of the electrification of Protected Farming communities (PFC):
MWA has erected seven PFCs with electric fences of which 5 are include in our analysis with the others more recently added. Hese barriers have a 96% success rate. 120 households are now farming within this area and increasing their production.

Evidence of improved elephant safety outcomes attributable to the implementation of this project:
Molwene:
Molwene was collared in southern Mozambique in 2023, entered South Africa just below the Kruger National Park on 15 August 2024 (Figure 7a), together with another collared elephant. The next day they started heading towards sugar cane fields in the vicinity of Komatipoort, thus the potential for human-elephant conflict (HEC) was high. The Elephant Shepherd Unit of Elephants Alive was deployed to address the situation and travelled over four hours to get to the area in the late afternoon on 16 August, to chase the elephants back to Mozambique. It seems the total number of elephants in the group was four. The collar GPS rates were increased to 10-minute intervals to facilitate finding the collared elephants.

The mitigation team made use of two ambushes to change the direction of the movements of the two elephants back to Mozambique (Figure 7a). Ambush 1 took place at about 19h30 and included pepper paintballs and a screamer, but this caused the elephants to move more towards the sugar cane fields. The Shepherds were instructed to head north and intercept them from entering the cultivated areas. Ambush 2 occurred at about 20h10 at a location between the elephants and the sugar cane fields. This ambush included normal paintballs and a screamer and successfully changed the movement of the elephants back towards Mozambique.

The elephants moved quickly towards Mozambique and entered the country at about 02h30 on 17 August (Figure 7a). Once they got to Mozambique they continued moving south along the Namaacha corridor reaching a total distance of 82km since intervention.

Cipriano:
Cipriano is a bull, collared in southern Mozambique in September 2024. He entered South Africa just below the Kruger National Park on 2 March 2025, together with three other bulls, and headed southwards towards to the crop fields (Figure 7b). There was a high risk of HEC. Once again, the Elephant Shepherd Unit of Elephants Alive was deployed to the area, arriving there 5 March 2025 after permission was granted by the Provincial administration to operate in the area. There was collaboration with farmers in the areas. After repeated ambush attempts throughout the night with the group moving too close to densely human populated areas, it was agreed to call in a helicopter the next day to herd them in the right direction. The helicopter arrived the morning of 6 March and the mitigation started around 10am. Cipriano and his group were chased through the crop fields to a hole that was quickly made in an obstructing fence up ahead, through which the helicopter guided them around midday. At 12h30 the helicopter had to return due to fuel shortage and the mitigation continued on the ground by our field team. This was successful and Cipriano returned to Mozambique on the exact same path that he came from, on 6 March 2025 at around 21h30.

Note: We also created a video on social media (https://www.instagram.com/reel/DG3rBGZM31P/) where many people interacted with it. We would be more than happy to discuss the use of these materials further. Please contact ___ to discuss this.

Kopke:

Kopke is a bull, collared in southern Mozambique in June 2024. He entered South Africa south of the Kruger National Park, on two occasions. The first entry was on 29 March but he exited back into Mozambique on 5 April 2025. The second entry was on 6 April 2025 and he headed to important crop fields with 5 other companions, with potential for HEC. The Elephant Shepherd Unit of Elephants Alive was deployed to the area on 10 April after again getting permission from the relevant Provincial authority to operate in the area as well as real-time track sharing from MWA. After three ambush events, Kopke was successfully chased back to Mozambique in the early morning hours of 11 April 2025.

The table below provides some basic statistics for the four collared elephants that were mitigated, starting from last successful ambush until they were back in Mozambique. All track segments are at 10-minute intervals, except for Kopke: Kopke's track intervals vary between 10minute, 30 minute and 60-minute intervals.

Elephant	From last Ambush	Time period	Average speed	Track segment maximum speed	Track segment maximum distance	Total distance
Molwene	Ambush 2	16 Aug 20h10 – 20 Aug 08h00	0.70 km/hr	5.49 km/hr	0.74 km	82.01 km
Cipriano	Ambush 5 (helicopter)	6 Mar 09h50 – 6 Mar 21h45	1.85 km/hr	6.58 km/hr	1.10 km	25.98 km
Kopke	Ambush 3	10 April 18h00- 11 April 09h00	0.87 km/hr	4.20 km/hr (30 min track length)	2.07 km (30 min track length)	15.13 km
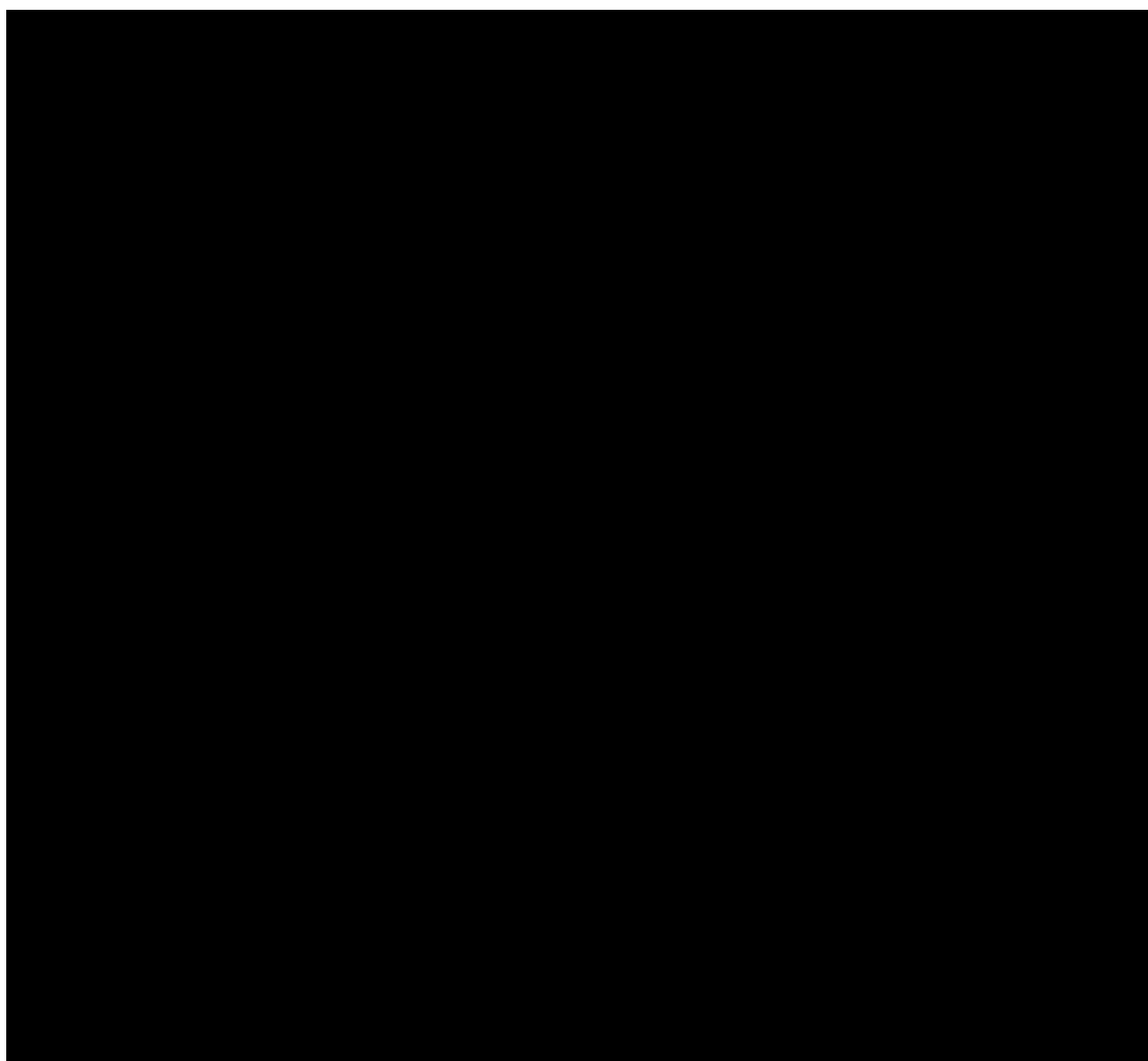
Annex 1:   Report of progress and achievements against logframe for Financial Year 2024-2025

Project summary	Progress and Achievements April 2024 - March 2025	Actions required/planned for next period
Impact Ensuring the long-term preservation of one of southern Africa's largest Transfrontier elephant populations through the establishment of a community-owned and income-generating wildlife corridor.	Long-term preservation of southern Africa's transboundary elephant populations through a community-owned, income-generating corridor that supports biodiversity and local livelihoods.	
Outcome Elephant crop losses significantly reduced, perceptions towards elephants improved and retaliatory killings reduced. Sustainable HEC mitigation strategies, facilitating financial resilience, are adopted by communities living alongside a recognized wildlife corridor.		
Outcome indicator 0.1 0% reduction in crop losses from elephants by Year 3 in the project area based on pre project survey data.	Preliminary reports from demonstration plots show reductions in crop loss where beehive fences, chilli rags, and flashing lights have been deployed. See Section 3.3 and Annex 4.	Continue monitoring crop losses and expand mitigation coverage to new farms for broader impact assessment in Year 3.
Outcome indicator 0.2 Households in the project site record a higher average income (>10% increase) per person per month (baseline national average $142).	Early income reports from honey and essential oil sales indicate a positive trend. Household surveys to quantify income changes are ongoing. See Section 3.3.	Complete Year 3 income surveys and analyse household economic data for inclusion in final report.
Outcome indicator 0.3 100% decrease in elephant mortality from illegal killings or Problem Animal Control in the project area by the end of Year 2 after a baseline of 7 human fatalities for the whole of Mozambique.	See Section 3.3 and Annex 4 for more detail.	Maintain RRU activity, community engagement and rapid response systems.
Outcome indicator 0.4 40% decrease from the forty-one (Earth Ranger data) HEC cases reported to the ANAC/ district authorities.	HEC reports dropped from 128 in Year 1 to 89 in Year 2, a 30.5% reduction. See Section 3.	Expand mitigation methods to remaining high-conflict zones and continue real-time response integration.
Outcome indicator 0.5 20% increase in food production in project area by end of Year 3 relative to Year 1	Improved yields reported at fenced and protected sites, monitoring ongoing to quantify overall increase. See Section 3.3.	Continue crop monitoring across the corridor to finalise comparative Year 1 and Year 3 production figures.

Outcome indicator 0.6 30% increase in the number of elephants utilising the wildlife corridor by Year 3, including herds (signalling increased sense of safety amongst cows with a baseline of zero).	35 elephants (including herds) are now moving through the corridor, up from baseline of 0. See Section 3.3.	Continue GPS collar tracking and document additional herd movements to validate sustained corridor use.
Outcome indicator 0.7 A 10% increase (from a baseline of zero) in upskilled community members who implement new income- and non-income HEC mitigation strategies by the end of Year 3, such as beekeeping and the growing of unpalatable crops.	Pre project surveys completed	Post project surveys to be completed
Outcome indicator 0.8 New agricultural developments, like communal farm production of unpalatable crops to increase productivity, are represented in 20% of farms within the study site versus a pre-project baseline of 0%	Pre project surveys completed	Post project surveys to be completed
Outcome indicator 0.9 An increased understanding of the value of biodiversity and its importance for sustainable socio-economic development.	Pre project surveys completed	Post project surveys to be completed
Outcome indicator 0.10 Recognition by Mozambique's Planning and Infrastructure District Service of biodiversity requirements during land-use planning.	No additional update at this stage.	Legal documentation required
Outcome indicator 0.11 Decrease the Gender Inequality Index (World Health Organisation) of the project site to below the national average of 0.54 by year 3.		Continue to asses GESI
Output 1. Further understanding of the motivation behind elephant movements from core conservation areas into peripheral PAs, as well as their crop-raiding strategies (Phase 1).		
Output indicator 1.1 Number of collared elephants moving through the corridor is to be increased from 20 to 35 by the end of Year 3 due to 30 additional collars deployed.	20 elephants have been collared over the first two years. One collar was re-deployed. See Section 3.2.	Deploy remaining collars in Year 3 and complete spatial analyses to inform corridor planning.
Output indicator 1.2 Elephant movement through the corridor and associated crop raiding hotspots will be updated each year until the end of the project as movement data collection increases. Each month will serve as a baseline for the next. Output indicator 1.3 Key natural resources (i.e., key plant species or vegetation communities) driving elephant movements through the corridor are established through remote sensing and ground-truthing by end of Year 3	Home range models and corridor maps based on 20 collared elephants were completed and shared. See Section 3.2. Continue digital twin work. See Section 3.2.	Update models with additional collar data and finalise corridor definition by project end. Finalise publication and digital twin analyses

Output indicator 1.4 Elephant stress hormones within the corridor are established and compared to baseline levels within the Greater Kruger National Park by end of Year 3		Continue to collect data on stress hormones
Output 2. Ensuring human and elephant safety with the establishment and deployment of an additional Rapid Response Unit (RRU) and ensuring the protection of human assets through the establishment of non-income generating barriers (Phase 2).		
Output indicator 2.1. Based on a pre-project baseline of 76% crop raiding prevention success rate by the RRUs in operation, an additional RRU will increase the success rate to 80% by Year 1 as it would allow to help cover more ground in the corridor (area of 36 707 km2, six regions, with 138,466 inhabitants) over the same period of time.	Four Rapid Response Units (RRUs) established and deployed. GPS tracking confirms extensive coverage. See Section 3.2.	Sustain RRU support and evaluate efficiency and coverage to inform handover to local agencies.
Output indicator 2.2. 20 educational workshops, hosting 250 participants in total per year, are facilitated in the corridor by the RRU in Year 1 following a baseline of 16 workshops hosting 178 people pre the grant period, focusing on how to increase personal safety around elephants.	Twelve training sessions conducted, reaching 420 people (144 women). See Section 3.2.	Refine training content and increase reach in Year 3 to meet participation and impact goals.
Output indicator 2.3 Human mortalities and casualties within the corridor aimed to be decreased by 100% by the end of Year 3 in comparison to survey records collected by the Mozambique Wildlife Alliance prior to project commencement according to which 7 people died across the whole of Mozambique due to elephant attacks (year prior to the project).	HEC data from EarthRanger and community reports actively monitored and analysed. See Section 3.2.	Continue real-time HEC data collection and integrate into digital twin for predictive modelling.
Output indicator 2.4 Demonstration plot programs in the Namaacha Valley (part of the corridor), funded by the Elephant Crisis Fund, are established in Year 1 (4 non-income generating barriers) **[DI-A04]**	Electric fences, beehives, soft barriers, and other mitigation tools deployed across communities. See Section 3.2.	Assess effectiveness and adapt mitigation plans based on site-specific results and feedback.
Output 3. Training and capacity building in sustainable and gender-equitable non-income and income-generating HEC mitigation opportunities promoted at watch towers as discussion sub-centres, whilst facilitating the understanding of the socio-economic needs of affected communities and their attitudes towards wildlife (Phase 3).		
Output indicator 3.1 The newly established watch towers in the Namaacha Valley (part of the corridor) will facilitate an increase of 50% attendance of households from Namaacha Valley in Year 1 and 80% in Year 3 relative to pre-project baseline of 50.	Three B.E.A.C.O.N. towers installed, serving as sub-centres for education and early warning. See Section 3.2.	Enhance tower-based engagement and monitor their role in increasing awareness and knowledge-sharing.
Output indicator 3.2 80% increase in the number of women attending workshops by Year 3 relative to Year 1.	Social surveys conducted and used to assess perceptions, risks, and mitigation uptake. See Section 3.2.	Conduct final round of surveys in Year 3 to compare changes over the project lifespan.

Output indicator 3.3 Usage of natural resources within the corridor is decreased by 20% by the end of Year 3, in conjunction with an 40% increase in the number of alternative income crops (elephant unpalatable) being planted in the same time period.	Cross-border exchange held between South African and Mozambican teams. See Section 3.2.	Conduct second exchange and expand focus on predictive modelling and community-based mitigation.
Output 4. Establishment and development of income- generating barriers within the corridor (beehive fences and elephant unpalatable crop types with a market value) (Phase 4)		
Output indicator 4.1 Demonstration plot programs in the Namaacha Valley (part of the corridor), funded by the Elephant Crisis Fund, are established in Year 1 (1 income generating barrier i.e. beehive fences). Establishment of alternative income generating crops with a market value (chili and essential oils) in Your 2-3	See a detailed breakdown of barriers in Section 3.2.	Final watch tower to be built in third Year of the project
Output indicator 4.2 40% average reduction in crop-raiding between the five mitigation strategies by the end of Year 3.	Pre project surveys completed	Post project surveys to be completed
Output indicator 4.3 Efficiency of each income and non-income generating mitigation strategy as elephant deterrents to be analysed and quantified by end of Year 3, as well as testing the combined effect of mitigation strategies.	Pre project surveys completed	Post project surveys to be completed
Output indicator 4.4 25% increase in our outlined income- and non-income generating mitigation methods have been applied within the project study site, relative to pre-project baseline of 0, by Year 3.	Pre project surveys completed	Post project surveys to be completed
Output indicator 4.5 30% of 2-acre beehive fences managed by two independent families as demonstration projects in the Namaacha valley for replication by others are occupied by bee colonies by the end of Year 2.	Regular monitoring of beehive occupancy by project manager. See Section 3.2.	Continue to monitor beehive occupancy. Complete post project surveys.
Output indicator 4.6 20% of farms within the study site have included essential oils and/or honey-related items as a part of their income generating products by the end of Year 3 with a pre-project base line of zero.	Pre project surveys completed	Post project surveys to be completed
Output 5. Increased knowledge and research on human-elephant-coexistence and ecological connectivity at local and national level. Successful models (post-application period) are replicated to upscale solving HEC at landscape level resulting in the establishment of biosphere reserves and reforestation schemes with functioning as vegetation steppingstones for elephant using the corridors (Phase 5).		
Output indicator 5.1 Community members living in the corridor (Namaacha Valley), show an increased understanding of the importance (value-based statements) of biodiversity protection and	Pre project surveys completed	Post project surveys to be completed

the potential for coexistence in Year 3, relative to pre-project baseline assessed by a social scientist.		
Output indicator 5.2 Research conducted on quantifying the corridor's connectivity using elephant movement data, combined with remote sensing, will be published and identify sections of the corridor to be prioritised according to their associated connectivity values by Year 1. Furthermore, three popular articles (one per year) with accompanying social media posts, will be published by the end of Year 3 to promote and inform about the corridor.	2 academic manuscripts written, 1 submitted	Complete minor corrections for submitted manuscript and submit draft manuscript to selected journal.
Output indicator 5.3 Relationships established at the watch tower conversation hubs enable 1-2 new community-oriented NGOs to work towards expanding the coexistence model to new sites within the corridor by the end of Year 3.	No additional update at this stage.	Organise meetings and setting up MOA.
Output indicator 5.4 Matched funding to the value of £ 600 000 is secured by the end of Year 3 to expand the coexistence model to a new community within the corridor.	MWA secured by end of year 3.	Complete further funding applications.
Output indicator 5.5 Land use legislation is revised to promote biodiversity and move towards the establishment of biosphere reserves.	No additional update at this stage.	Develop workshop framework and implement in Y3.

Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed)

Project Summary	SMART Indicators	Means of Verification	Important Assumptions
Impact: **Ensuring the long-term preservation of one of Southern Africa's largest Transfrontier elephant populations through the establishment of a community-owned and income-generating wildlife corridor.**			
Outcome: Elephant crop losses significantly reduced, perceptions towards elephants improved and retaliatory killings reduced. Sustainable HEC mitigation strategies, facilitating financial resilience, are adopted by communities living alongside a recognized wildlife corridor. Established models are replicated and upscaled to landscape level leading to land reform and biosphere reserves (post-project period)	0.1 40% reduction in crop losses from elephants by Year 3 in the project area based on pre project survey data. 0.2 Households in the project site record a higher average income (>10% increase) per person per month (baseline national average $142)[29]. 0.3 100% decrease in elephant mortality from illegal killings or Problem Animal Control in the project area by the end of Year 2 after a baseline of 7 human fatalities for the whole of Mozambique. 0.4 40% decrease from the forty-one (Earth Ranger data) HEC cases reported to the ANAC/ district authorities. 0.5 20% increase in food production in project area by end of Year 3 relative to Year 1. 0.6 30% increase in the number of elephants utilising the wildlife	0.1 Monitoring of elephant crop damage and reports submitted by the RRUs and ANAC wildlife authority. Recorded short-term mitigation strategies applied by the RRU will be analysed with collar movement data to determine efficacy of methods applied. 0.2 Pre- and post-project surveys by a social scientist for income from households registered with the project. 0.3 District Government, MWA and wildlife authority records. 0.4 District Government, MWA and wildlife authority records. 0.5 Pre- and post-project surveys by a social scientist. 0.6 Collar movement data. 0.7 Pre- and post-project surveys by a social scientist. 0.8 Pre- and post-project surveys by a social scientist.	- All mitigation methods are effective and applied and maintained correctly. Elephants do not become habituated to methods. - Viable market for income-generating crops/products, particularly the essential oil market, local and international. - HEC incidents are reported accurately. - Elephant collars remain active for the study period without malfunctioning or dropping off. - Crop protection efforts, upskilling, training opportunities and near immediate support from the RRUs are effective in fostering tolerance towards elephants. - Increased tolerance towards elephants facilitates the approval of establishing a wildlife corridor amongst the communities & within government.

corridor by Year 3, including herds (signalling increased sense of safety amongst cows with a baseline of zero).	0.9 pre-and post-project surveys.	- Other motives for elephant killing (i.e., poaching) do not override tolerance efforts.
	0.10 Legal documentation.	
0.7 A 10% increase (from a baseline of zero) in upskilled community members who implement new income- and non-income HEC mitigation strategies by the end of Year 3, such as beekeeping and the growing of unpalatable crops.	0.11. Pre-assessment of the Gender Inequality Index (World Health Organisation) to assess inequality across reproductive health, empowerment and labour market as per the guidelines, followed by a post-assessment after Year 3.	- Political interference does not negatively affect communities' support for corridor conservation.
		- Collared and non-collared elephants, including herds, utilise the established corridors.
0.8 New agricultural developments, like communal farm production of unpalatable crops to increase productivity are represented in 20% of farms within the study site versus a pre-project baseline of 0%.	(https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII)	-The project site's Gender Inequality Index is above that of the national average.
0.9 An increased understanding of the value of biodiversity and its importance for sustainable socio-economic development.		
0.10 Recognition by Mozambique's Planning and Infrastructure District Service of biodiversity requirements during land-use planning.		
0.11. Decrease the Gender Inequality Index (World Health Organisation) of the project site		

	to below the national average of 0.54 by Year 3.		
Outputs: **1.** Further understanding of the motivation behind elephant movements from core conservation areas into peripheral PAs, as well as their crop-raiding strategies (Phase 1).	1.1 Number of collared elephants moving through the corridor is to be increased from 20 to 35 by the end of Year 3 due to 30 additional collars deployed. 1.2 Elephant movement through the corridor and associated crop raiding hotspots will be updated each year until the end of the project as movement data collection increases. Each month will serve as a baseline for the next. 1.3 Key natural resources (i.e., key plant species or vegetation communities) driving elephant movements through the corridor are established through remote sensing and ground-truthing by end of Year 3 1.4 Elephant stress hormones within the corridor are established and compared to baseline levels within the Greater Kruger National Park by end of Year 3	1.1 Increasing the number of study animals allows for better monitoring of elephant movements and continuous significant build-up of the movement database. 1.2 Reports from RRUs (MWA) combined with remote sensing data and spatial analytic tools of elephant movements will allow them to target hotspots for ground-truthing and social surveys conducted by a social scientist. 1.3 Database of key plant species and/or vegetation communities is identified through remote sensing, as well as on-site vegetation surveys for ground truthing. 1.4 Collection and analysis of faecal samples of corridor moving elephants by *For Elephants* (Dr. Kari Morfeld), and comparison to baseline levels established by Dr. Morfeld in the Greater Kruger National Park.	- Elephants of a particular sex and age group will be found in the optimal location for collaring and research purposes. - The collars remain active for the study period without malfunctioning, individuals dying or illegally killed. - Partner organisations remain committed and able to support collaring operations and data analyses.

2. Ensuring human and elephant safety with the establishment and deployment of an additional Rapid Response Unit (RRU) and ensuring the protection of human assets through the establishment of non-income generating barriers (Phase 2).	2.1 Based on a pre-project baseline of 76% crop raiding prevention success rate by the RRUs in operation, an additional RRU will increase the success rate to 80% by Year 1 as it would allow to help cover more ground in the corridor (area of 36 707 km$_2$, six regions, with 138,466 inhabitants) over the same period of time.	2.1 RRU reports and MWA-ANAC human-wildlife conflict data collection from site representatives of District Services of Economic Activities (SDAE) in combination with elephant movement data analysis (trajectories and speed) will allow us to measure each RRU's success spatially and temporally on a monthly basis.	- Additional funding is acquired to equip another RRU to ensure all impacted communities feel supported and integrated into the RRU deployment plans.
	2.2 20 educational workshops, hosting 250 participants in total per year, are facilitated in the corridor by the RRU in Year 1 following a baseline of 16 workshops hosting 178 people pre the grant period, focusing on how to increase personal safety around elephants.	2.2 Attendance registers collected on the number of participants for each workshop. Voluntary membership system is created to offer continuous support to workshop attendees.	- An additional RRU is able to provide further HEC relief along the corridor. - Communication channels for reporting HEC remain operational and available throughout the corridor via already-established platforms.
	2.3 Human mortalities and casualties within the corridor aimed to be decreased by 100% by the end of Year 3 in comparison to survey records collected by the Mozambique Wildlife Alliance prior to project commencement according to which 7 people died across the whole of Mozambique due to elephant attacks (year prior to the project).	2.3 Comparison of historical records collected by the Mozambique Wildlife Alliance, as well post-project surveys by a social scientist.	- The RRUs continue to train the District Services of Economic Activities (SDAE) on HEC mitigation strategies to ensure a successful handover of responsibility once long-term mitigation strategies have been implemented.
	2.4 Demonstration plot programs in the Namaacha Valley (part of	2.4 Questionnaire surveys by a social scientist to establish community attitude towards non-income demonstration plots, with pre-and post-investigations. Social surveys provide quantifiable data on improved livelihoods due to increase crop protection pre- and post investigations.	- Each mitigation method is applied and maintained properly

	the corridor), funded by the Elephant Crisis Fund, are established in Year 1 (4 non income generating barriers)		
3. Training and capacity building in sustainable and gender-equitable non-income and income-generating HEC mitigation opportunities promoted at watch towers as discussion sub-centres, whilst facilitating the understanding of the socio-economic needs of affected communities and their attitudes towards wildlife (Phase 3).	3.1 The newly established watch towers in the Namaacha Valley (part of the corridor) will facilitate an increase of 50% attendance of households from Namaacha Valley in Year 1 and 80% in Year 3 relative to pre-project baseline of 50. 3.2 80% increase in the number of women attending workshops by Year 3 relative to Year 1. 3.3 Usage of natural resources within the corridor is decreased by 20% by the end of Year 3, in conjunction with an 40% increase in the number of alternative income crops (elephant unpalatable) being planted in the same time period.	3.1 Permanently designated and newly constructed watch towers function as conversation hubs and allows for a single point-of-contact, information sharing and brainstorming centre for local inhabitants, and for a continuous attendees' registration database collection. 3.2 Records of the number of attendees, pre- and post-project surveys, collected by a social scientist. 3.3 Pre- and post-project surveys by a social scientist with workshop attendees.	- Keen interest in upskilling opportunities from the community. - Socially acceptable for women to gain new skills and generate their own income. - Continued efficacy of income- and non-income generating HEC mitigation methods. - All new agricultural endeavours follow sustainable practices that do not result in increased biodiversity loss or degradation. - Increased financial security will decrease dependency on natural resource use. - Watch towers prove to become a knowledge and discussion sub-centres where communities from outside the corridor visit and learn from.
4. Establishment and development of income-generating barriers within the corridor (beehive fences and elephant unpalatable crop types with a market value) (Phase 4)	4.1 Demonstration plot programs in the Namaacha Valley (part of the corridor), funded by the Elephant Crisis Fund, are established in Year 1 (1 income generating barrier i.e. beehive fences). Establishment of	4.1 Questionnaire surveys by a social scientist to establish community attitude towards demonstration plots, with pre-and post-investigations. Social surveys provide quantifiable data on improved livelihoods due to	- Each mitigation method is applied and maintained properly. - Following comprehensive beekeeping training and set-up of a monitoring system, the beehive fence will be maintained.

	alternative income generating crops with a market value (chili and essential oils) in Your 2-3	diverse income streams pre-and post-investigations.	- Bee colonies have enough available resources to prevent colonies absconding from hives.

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

4.3 Efficiency of each income and non-income generating mitigation strategy as elephant deterrents to be analysed and quantified by end of Year 3, as well as testing the combined effect of mitigation strategies.

4.4 25% increase in our outlined income- and non-income generating mitigation methods have been applied within the project study site, relative to pre-project baseline of 0, by Year 3.

4.5 30% of 2-acre beehive fences managed by two independent families as demonstration projects in the Namaacha valley for replication by others are occupied by bee colonies by the end of Year 2.

4.6 20% of farms within the study site have included essential oils and/or honey-related items as a part of their income generating products by the end of Year 3

4.2 Pre- and post-project surveys by a social scientist, remote sensing and spatial analysis of collared elephants' movement.

4.3 Quantitative data collection and analyses of demonstration plots between Year 2-3 (Project Manager).

4.4 Pre- and post-project surveys by Project Manager within the study site.

4.5 Beehive occupancy monitoring by Project Manager.

4.6 Pre- and post-surveys by a social scientist with the farmers of the selected farms.

- Essential oil crops are not negatively impacted by environmental conditions (i.e., drought).

- Communities are open to alternative crop production and willing to apply mitigation strategies to prevent crop-raiding.

- An interest from local and international markets in producing essential oils and/or honey-related items. Knowledge and skill transfer from Proof-of-Concept Projects established in South Africa.

	with a pre-project base line of zero.		
5. Increased knowledge and research on human-elephant-coexistence and ecological connectivity at local and national level. Successful models (post-application period) are replicated to upscale solving HEC at landscape level resulting in the establishment of biosphere reserves and reforestation schemes with functioning as vegetation steppingstones for elephants using the corridors.	5.1 Community members living in the corridor (Namaacha Valley), show an increased understanding of the importance (value-based statements) of biodiversity protection and the potential for coexistence in Year 3, relative to pre-project baseline assessed by a social scientist. 5.2 Research conducted on quantifying the corridor's connectivity using elephant movement data, combined with remote sensing, will be published and identify sections of the corridor to be prioritized according to their associated connectivity values by Year 1. Furthermore, three popular articles (one per year) with accompanying social media posts, will be published by the end of Year 3 to promote and inform about the corridor. 5.3 Relationships established at the watch tower conversation hubs enable 1-2 new community-oriented NGOs to work towards expanding the coexistence model to new sites within the corridor by the end of Year 3.	5.1 Pre- and post -project surveys. 5.2 Academic journals, magazines, websites, social media pages. 5.3 Meeting minutes and signed MOUs between partners. 5.4 Sufficient funds awarded from external partners. 5.5 Workshops with governmental agencies enable legislative and policy revisions in line with biodiversity objectives of greater biosphere reserves.	- Outputs 1-4 lead to greater understanding of ecological connectivity and increased tolerance towards elephants. - Academic interest in project results and the model can be replicated elsewhere. - Funding bodies understand the worth of the project and find value in the replication of the model. - Governmental agencies promote and support biodiversity objectives and are prepared to review current legislation and policies.

	5.4 Matched funding to the value of £ 600 000 is secured by the end of Year 3 to expand the coexistence model to a new community within the corridor. 5.5 Land use legislation is revised to promote biodiversity and move towards the establishment of biosphere reserves		

Activities (each activity is numbered according to the output that it will contribute towards

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)

1.2 Spatial analysis of elephant movements through remote sensing/GIS, and field-based data collection in Year 1-3

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

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

2.1 Deploy RRUs to mitigate HEC Year 1-3

2.2 RRU hosts educational workshops in Year 1

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

2.4 Establish 4 types of non-income generating barriers as demonstration plots in the Namaacha Valley (Year 1)

3.1 Construction of watch towers for hosting educational orientated workshops and record keeping of attendees in Year 1-3 with one tower a year

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

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 scientists will follow non-medical human ethics guidelines in Year 1 and 3 with focus on resource use analyses

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)

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

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

4.4 Community field surveys by social scientists following non-medical human ethics guidelines in Year 1 and 3 to quantify increased use of barriers over time

4.5 Field base data collection on apiary (monthly with overall annual assessments each year since installation (Year 1 – 3)

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

5.1 Community field surveys by social scientists following non-medical human ethics guidelines (Year 1 and 3) focused on value-based statements involving biodiversity and coexistence values.

5.2 Publishing a scientific paper in a peer-reviewed scientific journal, as well as publishing popular articles through major news outlets in Year 3 and beyond

5.3 Organizing meetings and setting up MOAs with strategic organisations in Year 3

5.4 Strategic fundraising endeavours for additional sources of income starting in Year 2 but secured by Year 3

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)

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, scheme, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	Y
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	Y
Is your report more than 10MB? If so, please consider the best way to submit. One zipped file, or a download option, is recommended. We can work with most online options and will be in touch if we have a problem accessing material. If unsure, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	N/A
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Y
Have you provided an updated risk register? If you have an existing risk register you should provide an updated version alongside your report. If your project was funded prior to this being a requirement, you are encouraged to develop a risk register.	Y
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see Section 16)?	Y
Have you involved your partners in preparation of the report and named the main contributors	Y
Have you completed the Project Expenditure table fully?	Y
Do not include claim forms or other communications with this report.	