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

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

Submission Deadline: 31st October 2023

Project reference	DARNV014
Project title	**Pioneering approaches for drone use in biodiversity conservation**
Country(ies)/territory(ies)	Madagascar
Lead partner	Durrell Wildlife Conservation Trust
Partner(s)	
Project leader	*Andriatsitohaina RAKOTOZOELY (Tsito)*
Report date and number (e.g. HYR1)	*30/10/2023-HYR1*
Project website/blog/social media	

Outline progress over the last 6 months (April – Sept) against the agreed project implementation timetable (if your project has started less than 6 months ago, please report on the period since start up to end September).
Although we are not looking for specific reporting against your indicators, please use this opportunity to consider the appropriateness of your M&E systems (are your indicators still relevant, can you report against any Standard Indicators, do your assumptions still hold true?). The guidance can be found on the resources page of the relevant fund website.

Techniques established for semi-automated reforestation monitoring using drones: **Started**,
- Project methodology has already been applied in the first reforestation plot mapping and data collection conducted in Alaotra. This was over a 200Ha reforestation area followed by ground sample measurement and tree species manual inventory.
- AI pipeline building has started to create the young trees recognition algorithm based on Python language, and data collected from drone flights has been prepared for machine learning to allow the knowledge database building system.
- Reforestation area drone mapping for Menabe is planned for November-23. This timing will allow to data to be collected before the rainy season so the young trees will be easier to identify and could be use to feed the machine learning database.
- The LIDAR Drone has been ordered for the next reforestation area mapping. This data will be compared to the RGB orthophotos obtained during the first flight.
- A trainee has been hired for semi-automated reforestation assessment algorithm.

Capacity developed for using drones for environmental conservation in Madagascar: Started:
- Five staff from Durrell in Alaotra have been trained in drone operation and will take the Drone exam to allow their registration as Durrell's official drone pilots and will be declared to the civil aviation authority. The training was focused in mapping and Bandro detection inside the march of Alaotra.
- The drone course has been updated to meet the new requirements for drone operations inside protected area and national parks in Madagascar, this is done in collaboration with the official National Qualified Entity for Pilots and Aeronautical training in Madagascar.

Discussion with partners and the ministry of environment has been initiated, in order to plan the next drone training for their staff including trips to different sites around Madagascar. This will be advantageous to have the practice directly on the working and real environment instead of doing it in Tana with different conditions (vegetation, weather, topographic profile).

Drones demonstrated as an effective detection and deterrence mechanism for environmentally damaging behaviour and informing and responding to SMART patrol activity:

- Two field work operations have been conducted in Menabe Antimena by the drone team:

1. Aerial patrol and mapping based on SMART information. The notifications and log from SMART patrol was transformed into a map to identify the area where ground patrols cannot enter. The first field period allowed us to detect the cutting area (possibly to be burnt in the next fire season), the illegal camps inside the PA and provided information to be shared with the ground patrol. Photos and videos will be used as proof for law enforcement on the actual situation inside the PA.

2. The second field work was conducted during the fire season (September-October) working with the ground patrol. This methodology allows us to detect fire as soon as it's started and redirect the fire agent to reach the area in a safe manner and by the shortest access point for firefighting. At the same time, drone flying above the PA and burnt area is seen by local communities and helps in communication and sensitisation. This allows reactivity and intervention by the ground patrols, to help in minimising the area of burnt forest. This methodology is shared in real time with the local team to be used during weekly and daily ground patrol, particularly in the fire season. Results: 1. Three fire starting points detected, notified and managed by the local firefighters. 2. Daily Aerial patrol and ground patrol enforcement conducted with local rangers reduced the illegal access inside the PA through deterrence: the fact that local people are aware that the drone is perform daily flight and surveillance. 3. Reduction of fire points during drone field work and aerial patrols. Without drone flights, at least three fire points per day are noticed by the ground patrol. This number decreases with daily drone flights in random hours of the day.

The first robust, range-wide survey of Alatroan gentle lemur is delivered using drone-based infra-red detection of lemurs as a model for animal detection using this technology in Madagascar:

Started:

- Field work has been conducted in Alaotra inside the marsh, based on the new methodology- the flight path follows a transect 500meters by 250 meters, at height of 25 -30 meters, which ensures the lemurs are not disturbed by noise Each flight takes 25-30 minutes. Ground verification has been done with patrols to confirm the detected species as Bandro. On screen counting has provided an approximation of the number in one group. Video footages have been sent to the LJMU team for machine learning and to calculate the exact number of lemurs detected.

- Flight protocol has been updated based on field experiences such as weather condition (fog); which has an impact on lemurs wake-up time, as well as flights performed in full moon condition. Lemurs are active earlier and the interval time varies depending on light condition. Lemurs temperature as detected by the drone stay the same through winter and summer. The biggest change in their wake up time is influenced by sunrise time. Vegetation type impacts the number of lemurs living inside the marsh. Each area is divided by zone and by different vegetation type. The lemurs are more visible in papyrus dominated vegetation.

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

For the LIDAR Drone shipping from the UK to Madagascar, the VAT and shipping fees are higher than expected and drone batteries could not be shipped by air so we need to identify another company which can send it in Madagascar safely and the risk is that it will take more time than expected (45 days to 60 days). If a supplier is not identified by December, a change request will be submitted.

Collaboration with partners and the Ministry of Environment depend on their availability. Madagascar is in the election phase for the last three months of 2023 (election due to take place in mid November), so collaboration may become more difficult, as most of the officials are assigned to election tasks, even if they are working in environment domain.
3. Have any of these issues been discussed with NIRAS and if so, have changes been made to the original agreement?
Discussed with NIRAS: Yes
Formal Change Request submitted: No
Received confirmation of change acceptance No
Change request reference if known:

4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2023 – 30 September 2023)

Actual spend: £[redacted]

4b. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this financial year (ending 31 March 2024)?

☐ **No** ☐ Estimated underspend: £

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

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

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

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

If you are a new project and you received feedback comments that requested a response, or if your Annual Report Review asked you to provide a response with your next half year report, please attach your response to this document.

All new projects (excluding Darwin Plus Fellowships and IWT Challenge Fund Evidence projects) should submit their Risk Register with this report if they have not already done so.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but should also be raised with NIRAS through a Change Request. Please DO NOT send these in the same email.

Please send your **completed report by email** to BCF-Reports@niras.com. The report should be between 2-3 pages maximum. **Please state your project reference number, followed by the specific fund in the header of your email message e.g. Subject: 29-001 Darwin Initiative Half Year Report**