



Darwin Initiative/D+ Project Half Year Report (due 31st October 2019)

Project reference	26–018
Project title	Promoting public health in a biodiverse agroforest landscape in Guinea-Bissau
Country(ies)/territory(ies)	Guinea-Bissau
Lead organisation	University of Exeter (UoE)
Partner(s)	Institute for Biodiversity and Protected Areas (IBAP), National Association for Local and Urban Development (NADEL), Robert Koch Institute (RKI), Centre for Research in Anthropology (CRIA)
Project leader	Dr Kimberley Hockings
Report date and number (e.g. HYR3)	HYR1
Project website/blog/social media etc.	@KJHockings @hellen_wildlife

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

A first meeting with project partner RKI was held at the Centre for Ecology and Conservation, UoE (UK) prior to the project start date (1st July 2019). During this meeting Project Leader Dr Kimberley Hockings (PL) and Darwin Research Fellow Hellen Bersacola (DRF) presented and discussed the project activities and timeline with Dr Fabian Leendertz (RKI), Professor Brendan Godley (UoE, Co-I) and Dr Camille Bonneaud (UoE, Co-I). During the last three months (start of the project 1st July – end of September 2019) activities focused on making logistical preparations and developing a detailed plan for implementing project activities in Y1. In August PL and DRF spent two weeks in Guinea-Bissau meeting and discussing the project objectives, activities and timeline with project partners **IBAP** (Aissa Regalla, Dr. Abilio Rachid Said, Queba Quecuta, Maria Eliza Embalo (finance officer), eight appointed Darwin Field Officers), **NADEL** (Aristoteles Gomes-Lopes and Sidi Jaquite), and **CRIA** (Professor Amélia Frazão-Moreira, Dr Hannah Parathian) as well as **local stakeholders in Cantanhez** (Regional chief Mamadu Camará as well as village and women association representatives in Cadique, Caiquene and Lemberem). The DRF underwent training in Cybertracker data import and data management in SMART for biodiversity monitoring, and how to employ OpenDataKit for social surveys.

In September, project activities included developing data collection strategies for Output 1 and 2, the PL presenting the project rationale and objectives at the European Federation for Primatology/Primate Society of GB conference “*Developing an evidence-based conservation strategy for Cantanhez National Park, Guinea-Bissau*”, logistical planning for fieldwork, and administrative activities including the project partners signing the contract drawn by the University of Exeter, and acquiring and preparing project equipment.

More details on the accomplishments and Y1 developed plans for each of the four project Outputs are provided below.

Output 1. *Reduced risks of leprosy transmission/outbreak in humans and disease-related conflicts (e.g. retaliatory killing of wildlife) through an evidence-based public health campaign across Cantanhez NP.*

PL, DRF and AFM met with Sidi Jaquite (director of NADEL) in August 2019 to discuss project Output 1. The meeting resulted in the development of a new strategy regarding the appointment of a Darwin Project Officer (DPO 1). For the first phase of the project (pre-campaign) a social scientist will be appointed for the role of DPO, which will involve gathering baseline data on knowledge and perceptions of disease across CNP (>50 households). For the second phase of the project (campaign, Y2), the role of DPO will be undertaken by an experienced campaign communication manager who will be responsible for implementing and supervising the public health campaign. The pre-campaign data collection questionnaire was developed in September by CRIA (HP and AFM) and NADEL (NADEL-appointed Darwin Project Officer Dr Samba Camará [SC]). Pre-campaign data collection will be carried out by SC starting in November. Data will be collected using OpenDataKit and preliminary analysis (questionnaire evaluation) will be carried out in January 2020. The DRF is currently working NADEL and CRIA to finalise a data collection strategy to be carried out with health practitioners and key informants across Cantanhez NP (pre-clinical training questionnaires and in-depth interviews).

Output 2. *Improved wildlife management capacity through the establishment of the first health and abundance systematic monitoring programme for key terrestrial biodiversity in Guinea-Bissau.*

Following detailed discussions with IBAP in August, the protocol for implementing the biodiversity monitoring programme was completed in September 2019. The 40-page document includes details on sampling design, training sessions, data collection, data entry and management for line-transect surveys, camera trap surveys and chimpanzee health surveys (faecal sampling and targeted camera traps). The implementation of the protocol will allow us to achieve the following objectives: (1) establish the first estimates of population numbers of six primate species including Western chimpanzee (*Pan troglodytes verus*), Temminck's red colobus (*Piliocolobus temminckii*), western black and white colobus (*Colobus polykomos*), Green monkey (*Cercopithecus sabaesus*), Guinea baboon (*Papio papio*), and Campbell's monkey (*Cercopithecus campbelli*) using distance sampling on line transects; (2) identify environmental and anthropogenic factors affecting primate densities using Bayesian distance sampling (via INLA approach); (3) monitor indices of abundance of other wildlife using indirect sign counting on line transects; (3) monitor occurrence patterns of wildlife using camera trap-based occupancy models; (4) identify sick wildlife and monitor prevalence and distribution of disease using faecal sampling and camera traps; (5) test whether environmental and anthropogenic factors influence disease occurrence and/or prevalence using Bayesian spatial models (INLA approach); (6) combine the interpolation maps generated via Bayesian INLA spatial models to identify interaction hotspots, i.e. inform Output 3.

The implementation of the biodiversity monitoring programme will start in November 2019. This will involve DRF training and working with the appointed IBAP Darwin Project Officer and eight DFOs to establish survey routes (64x 1km-long line transects covering forest blocks and corridors across Cantanhez NP), and occupancy-based survey camera traps (at least 50, deployed on or in proximity of a line transect).

Two training sessions are scheduled at the beginning and end of November. The training will focus on GPS use, transect set up and maintenance, selection of camera trap points, use and maintenance of camera traps, collection of distance sampling data using datasheets and GPS, data collection using Cybertracker on Blackviews, and data entry and management (including BaseCamp, SMART softwares). The training sessions will be conducted by the DRF with the assistance of experienced local field guides Mamadu Cassamá and Iaia Camará (appointed by IBAP for this project) who have expertise in identifying local fauna and flora, and collaborator, Chloë Chesney (Tacugama Chimpanzee Sanctuary, Sierra Leone), who has experience with training forest guards across Sierra Leone on survey/patrol data collection using Cybertracker and data management and analysis using SMART. Data collection is expected to begin in January 2020. The IBAP-appointed DPO will be responsible for entering survey data, reviewing camera trap footage, producing summary reports, and bi-monthly data sharing with IBAP and UoE. A preliminary dataset for evaluation is expected to be obtained by February 2020. The complete dataset of the first survey season to be used for Bayesian spatial models (by DRF) is expected to be obtained by the end of May 2020.

Output 3. *A human-wildlife interaction plan that extends protection of key wildlife habitat, and incorporates new regulations in areas of high human-wildlife interactions, including leprosy transmission risk, is developed for Cantanhez NP.*

In August 2019 the PL and DRF met with local stakeholders in Cantanhez NP including the regional chief, village heads and the president of the Iemberem women association. During these meetings we introduced the project objectives and discussed the role of local stakeholders in the development of a human-wildlife interaction plan (Output 3). In September the DRF developed a modelling strategy for generating evidence-based maps of Cantanhez NP using the data generated through Output 2 (including disease incidence and prevalence, primate density and wildlife abundance). Based on previous experience with Bayesian spatial modelling using the Integrated Nested Laplace Approximation (INLA) approach, state-of-the-art INLA methods for Bayesian inference was selected as the modelling approach. INLA will allow us to estimate the spatial autocorrelation in the data through a computationally efficient method (the SPDE) as well as take into account the landscape heterogeneity through the inclusion of covariates including in distance sampling-based density models (Bakka et al 2018; Bachl et al. 2019) . The INLA-Bayesian approach will allow flexibility in the sampling design, i.e. it will avoid us having to use a systematic transect grid, which is typically employed within representative sections of homogeneous habitats and is practically impossible or inefficient in a highly heterogeneous human-dominated landscape such as Cantanhez NP. Finally, the INLA approach will allow us to produce the interpolation maps required for informing Output 3.

Output 4. *Increased long-term readiness for potential public zoonotic threats and disease-related conflicts through the initiation of an outbreak preparedness and response strategy in Cantanhez NP.*

In August the PL, DRF, AFM (CRISA) and AR (IBAP) visited Cumura hospital in Bissau. We discussed the identification and treatment of leprosy in Guinea-Bissau and the capacity of local health centres to respond to leprosy cases. As part of the activity "Identify and Engage" (Output 4), we identified a knowledgeable Guinean nurse, Mario Tchuda, who had extensive experience in identifying and treating leprosy cases, as well as training other healthcare personnel in leprosy detection.

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2a. 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.

All activities are on schedule

2b. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?

Discussed with LTS: Yes/No

Formal change request submitted: Yes/No

Received confirmation of change acceptance Yes/No

3a. Do you currently expect to have any significant (e.g., more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend: £

3b. 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 rebudget Change Request as soon as possible. There is no guarantee that Defra will agree a rebudget so please ensure you have enough time to make appropriate changes if necessary.

4. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures?

No

If you were asked to provide a response to this year's annual report review with your next half year report, please attach your response to this document. Additionally, if you were funded under R25 and asked to provide further information by your first half year report, please attach your response as a separate document.

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

Please send your **completed report by email** to Darwin-Projects@ltsi.co.uk. The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g. Subject: 25-035 Darwin Half Year Report**