

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	IWTEV013
Project title	Unlocking DNA barcoding to identify illegal timber
Country(ies)/territory(ies)	Gabon, Democratic Republic of the Congo, United Kingdom
Lead partner	Royal Botanic Gardens, Kew (RBGK)
Partner(s)	University of Kisangani (UNIKIS), Democratic Republic of the Congo National Center for Scientific and Technology Research (CENAREST), Gabon World Forest ID (WFID), USA
Project leader	Royal Botanic Gardens, Kew (RBGK)
Report date and number (e.g. HYR1)	OCT20231
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.

Output 1: New data and knowledge providing a better understanding of the requirements for DNA barcoding implementation at key points of the timber trade supply chain

In collaboration with our partners in Gabon and the Democratic Republic of the Congo (DRC) a questionnaire (19 questions) was developed. This questionnaire aims at better understanding the current capacity and knowledge on timber tracing techniques within different stages of the timber supply chain. The questionnaire was sent out to 55 stakeholders in Gabon and the DRC, to the UK Office for Product Safety and Standards (which is responsible for timber shipment testing in the UK) and to the timber forensic institute “ENFORCE” in Belgium (which performs scientific testing for timber species identification).

A 3-day workshop was planned in September in Gabon to understand local capacity and needs for developing DNA barcoding at different points of the timber supply chain in the country. Several local stakeholders were invited, including a local media team to increase local outreach. However, due to political instability (coup) this meeting was moved to 4-7 December 2023. The postponing of the meeting will provide more time to analyse and summarise the results from the questionnaire before we discuss them with local stakeholders.

Output 2: A better understanding of timber DNA properties and of DNA extraction techniques that can improve its quality

We reviewed 36 research publications discussing different DNA extraction protocols. In addition, we held meetings with several international experts to discuss the application of published DNA extraction protocols. Meetings were held with Steven Janssens (Meise Botanic Garden, Belgium), Samuel Vanden Abeele (University of Cambridge, United Kingdom) and Céline Blanc Jolivet (Thünen Centre of Competence, Germany). Given that the research assistant had to start 6 weeks later than planned (15 May 2023) due to delays in the grant paperwork, we prioritised DNA extractions and library preparation for the DNA reference dataset (see Output 3) instead of designing and executing the experimental plan for protocol optimisation, which will be done based on our literature review while the reference DNA libraries are being sequenced by an external company in November/December. This reorganisation was necessary to ensure that we get the DNA reference data early enough in the project. Moreover, although it is not mandatory, the protocol optimisation work will ideally be informed by lab visits and discussions during the workshop in Gabon, which was postponed to early December due to the coup. To anticipate on this, we held online conversations with our partners in Gabon and DRC to discuss protocol logistic and economic constraints in the focus countries. This enabled us to get a good idea of the current capacity and needs for expansion in the relevant DNA laboratories in Gabon and DRC. For the CENAREST lab in Gabon, the following equipment was identified as key for future expansion of DNA barcoding projects: steel mill grinding jars, a centrifuge with adaptors for 96-well plates, pipette sets, a fluorometer, magnetic racks, a pH meter, a fridge-freezer and an electricity generator. To develop a fully functional timber DNA barcoding lab at UNIKIS in DRC would require a larger investment including building a room with lab benches, hoods, sinks and cupboards, and buying the previously-cited equipment as well as a gel electrophoresis unit, a transilluminator, and a PCR thermal cycler.

Output 3: A better understanding of the DNA barcodes and methods that can be used to monitor the trade of a key timber group

We have identified 25 species from 4 genera to be sampled, based on accepted species names as per Plants of the World Online. These include our focus species and all species from the same genera. We have looked at the global distribution of each species included in our sampling (based on Plants of the World Online) and selected herbarium specimens and World Forest ID samples from across the species range, but prioritising the focus countries (Gabon and DRC). This resulted in 1 to 18 samples per species. Out of these, 165 samples were from herbarium specimens and 17 from WFID. The DNA of all samples has been extracted and is currently undergoing DNA library preparation for target capture and Illumina sequencing. Genomic data will then be analysed to build the DNA barcoding reference dataset and search for genes suitable for being used as DNA barcoding markers. The researchers from Gabon and DRC are currently applying for the necessary visa to visit Royal Botanic Gardens, Kew on 8-26 January 2024, where they will learn to analyse target capture sequencing data and take part in developing and testing individual DNA barcoding markers identified in the genomic dataset.

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.

- 1) Due to the coup in Gabon we had to move the workshop from September to December. Most of the money already used to book hotels and flights could be recovered or used to pay later flights/hotels, except for 82.5 EUR (~71.6 GBP) that were used to pay a non-refundable hotel night during a stop-over in Istanbul. Postponing the flights also incurred an additional expense of 394.8 GBP due to exchange fees. These could be covered by the budget. The postponement of the workshop delayed a bit the diffusion of the questionnaire to Gabon stakeholders, as stakeholders in governmental institutions were expected to change following the coup, so we waited to know who would be in charge of the targeted offices once the political situation stabilised before sending the questionnaire to them. On the other hand, the postponement of the workshop is giving us more time to analyse and summarise the questionnaire responses before discussing them during the workshop. We mitigated against the postponement of lab visits in Gabon by discussing online about the current capacity and limitations for performing DNA barcoding labwork there. This had no negative influence on the development of timber DNA extraction protocols because the latter were also postponed (see below). There was no change request submitted regarding the workshop postponement but NIRAS was emailed about the situation.

2) Co-PI Victor Deklerck left the Royal Botanic Gardens, Kew and took up a position with World Forest ID. His time percentage and staff cost were re-allocated to co-PI Sidonie Bellot. This was communicated via a Change Request to NIRAS, which was approved.

3) The Research Assistant started with a 6 week delay compared to the original schedule because the necessary paperwork (grant contract) was not ready at the start of the project and the recruitment process takes time. This had an effect on the project in that we decided to start by doing the labwork necessary to generate the DNA barcoding reference dataset instead of starting by developing timber DNA extraction protocols. This decision was taken to ensure that the reference dataset data would be available sufficiently early in the project (at the latest in December) so that we would have enough time in quarter 4 to analyse the data and identify regions potentially suitable to be used as DNA barcoding markers, and to test the performance of these regions. As a result, the optimisation of timber DNA extraction protocols, which already started through literature reviews and discussions with experts and partners, was mainly postponed to November and December. We are on track with this revised schedule. No change request was submitted.

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:	Yes
Received confirmation of change acceptance	Yes
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: £ ██████████

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)?
 Yes **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?

No

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**