

MID-TERM ACTIVITY REPORT

BIFA3_37 - Mobilizing a country-wide, long-term camera trap dataset in Cambodia

Guidelines on how to complete the activity report are included in italics.

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Executive summary

Provide a brief explanation of the context and the approach taken for the mid-term evaluation, and a summary of the main conclusions, lessons learned and recommendations for the remaining project period.

This mid-term review summarizes progress made in data processing, solution selection, and solution implementation.

Data processing, indexing, and standardization has progressed well, with more than 75,000 images processed, resulting in 16,500 standardized species occurrence records. This has been conducted by WCS staff across several landscapes and at the headquarters, and supported by SFS students.

A software solution has been identified – Wildlife Insights, a dedicated camera trap data management solution developed by a consortium of several major conservation NGOs which incorporates all the desired features including technical developments such as machine vision. Launch was initially scheduled for during the project period, but has now been delayed until April 2019, beyond the project end date. To ensure maximum productivity and benefits from this project, the remaining activities and activity schedule will be updated, providing more staff time for image processing and extending the temporal coverage of data to be uploaded to GBIF to include more recent data. Hardware budgets allocated for server infrastructure will be reallocated to laptops to support the additional focus on staff processing images.

Data publishing steps have been taken, including registration with the France IPT, in order to publish standardized data as it is completed. A trial upload will take place in the coming months, with remaining data being published towards the end of the project.

The project has also raised the conversation of data publishing outside of camera trap data. Organizational response to making data more publically available has been positive, and several data sets unrelated to this project have been identified for publication through GBIF.

Contact information

Please provide the name, institutional affiliation, role in the project and contact details of the author(s) of the report.

Name of contact person	Simon Mahood / Olly Griffin
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Role(s) in project	Senior Technical Advisor / Data Analyst and Operations Technical Advisor

Introduction

This section should explain to readers what they will find in this report. It should include:

- *A description of how the evaluation has been carried out (e.g. consultation or surveys with project partners and participants). Please refer to the description of monitoring and evaluation plans in the original project proposal.*
- *A description of how the project partners will use the evaluation results.*

This mid-term review has been conducted by project staff members who are implementing the activities, with reporting overseen by the Senior Technical Advisor.

The project and its objectives

A brief summary of the project to help readers understand its objectives, including, for example:

- *The project's start date and expected duration*
- *A list of project participants and description of the main stakeholders*
- *The targeted capacity needs as outlined in the project proposal*

Cambodia's unique and globally important wildlife often exists over large areas, at low densities, adopting human-avoidance behaviors that make them increasingly elusive, meaning camera traps are

an important tool for biodiversity monitoring across a range of taxa. A wealth of camera trap images and data have been collected by WCS over the last 2 decades across the country, first using film-based camera traps and subsequently using digital camera traps as the technology became available. This dataset provides important information on species distribution and relative abundance for large and small mammals, as well as birds.

With multiple projects across many protected areas collecting a large number of images, data management is an important issue. Recently, 15,000 film-based camera trap images were digitized and indexed. The next phase of this work is the indexing of an estimated 75,000 digital camera trap images. Once completed, and with the full film and digital collection collated into an appropriate, dedicated system, this rich, long-term data set can be used in an array of monitoring and ecological studies.

This project is an opportunity to centralize camera trap data collected between 2001 and today into an effective and appropriate system, allowing access for future aggregate analysis and outreach.

The project is implemented by WCS Cambodia, with support from SFS for data processing.

Timeline: April 2018 – March 2019

Activities

Description of activity	Partners involved	Contribution of activity to goals listed in table 4.3	Status of activity as of mid-term reporting
Compiling inventories of biodiversity data holdings (for example, by implementing metadata catalogues)			
Data management standard selection	WCS	Required for achieving Goal 1	Solution identified, but release date delayed
Purchase of appropriate hardware	WCS	Required for achieving Goal 1	Hardware budget reallocated to laptops to support data processing
Biodiversity monitoring staff training on selection standard	WCS	Required for achieving Goal 1 and Goal 2	Training for data processing completed. Additional training time reallocated to data processing.
Importation of indexed data	WCS	Required for achieving Goal 2 and Goal 3	Data processing and standardisation progressing well. Importation of data to solution staff time reallocated to data processing.
Indexing and importation of additional data	WCS and SFS	Required for achieving Goal 3	Data processing and standardisation progressing well. GBIF data upload to begin soon.

Deliverables

This section should summarize the project activities completed by the mid-term, with a description of the associated outputs and deliverables. Please highlight any changes from the original plans provided in the full project proposal.

If no result has been achieved on a specific point, please indicate it as “no result achieved yet”.

a. Data

Details of datasets expected to be mobilized as an outcome of the project:

Title of dataset	Taxonomic/geographic scope	Approximate number of records (specimens)	Current format (e.g. undigitized, digitized)
Cambodia-wide WCS camera trap data	2001-2015, Cambodia, mammals and birds.	90,000+*	<p>More than 75,000 images have been processed and indexed, resulting in 16,500 species occurrence records.</p> <p>An additional 15,000 indexed images have been standardised into an appropriate format, give a total of more than 30,000* species occurrence records. *Note, this include non-independent captures.</p> <p>Digitized and indexed images are indexed in a Microsoft Excel file, which will be manipulated into a format which can be uploaded into a selected system.</p>

* includes possible blank and duplicate images

b. Other deliverables

Describe other deliverables expected from the project (e.g. publication of data papers, catalogues, reports etc.)

Two SFS students have completed their data processing and analysis report. As this was completed as part of a training course, the resulting report will not be made publically available. However, the data processing they undertook as part of the course is included in the dataset to be published through GBIF and used internally by WCS.

Calendar of activities

The calendar should be completed in the same way as in the Full Project Proposal (4.6) but should include any expected changes. Please provide reasons for any expected changes in the Notes column in the table below.

Proposed dates	Proposed Activity	Lead partner	Implementation/ revised date	Notes
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April 2018	Selection of appropriate management solution	WCS	April 2018	Management solution identified – Wildlife Insights, a global partnership between several NGOs
April/ May 2018	Preparation of unindexed data at headquarters and field sites by WCS staff and SFS students	WCS/ SFS	April- October 2018	More than 75,000 digital images processed and standardised, resulting in more than 16,500 animal captures/occurrence data points
May 2018	Purchase and installation of required hardware	WCS	November 2018	Cancelled, and assigned to laptop procurement to support image processing
June 2018	Importation of digitized film data at headquarters	WCS	June 2018	15,000 film images ready for importation into Wildlife Insights
June 2018	Publication of two SFS student analyses	SFS	June 2018 (revisions in August 2018)	Data processed and analysed, report attached in annex.
June/ July 2018	Attendance of project team member at BIFA Capacity Enhancement Workshop	WCS	June/July 2018	Completed
July/ August 2018	Staff training on selected solution at headquarters	WCS	December 2018	Cancelled, and staff time reassigned to data processing
August- Dec 2018	Importation of digital images at headquarters	WCS	November 2018	Cancelled, and staff time reassigned to data processing
Sept 2018	Field staff training on selected solution	WCS	December 2018	Cancelled, and staff time reassigned to data processing
Sept/ Oct 2018	Importation of digital images at field sites	WCS	November 2018	Cancelled, and staff time reassigned to data processing
Nov 2018- March 2019	Continued use of selected solution, support, and coordination between Project coordinator and field sites for newly collected data	WCS	November 2018-March 2019	Cancelled, and staff time reassigned to data processing
Nov 2018- March 2019	Continued enrichment of dataset (species identification, counts of individuals, etc) by project staff and volunteers	WCS	November 2018-March 2019	Cancelled, and staff time reassigned to data processing
March 2019	Publishing of dataset through GBIF	WCS	March 2019	Registered with France IPT
-	Procurement of laptops to support additional data processing	WCS	February 2019	Revised activity, budget reallocated from server hardware
-	Processing of additional data, including data from 2015-2018	WCS	January – March 2019	Revised activity, staff time from cancelled activities due to delay of external software launch

Project communications

Describe the plans to communicate and share the results of your project with the project stakeholders and broader GBIF community. Please also review the page describing your project available from <https://www.gbif.org/project/3GPlz6Ks40GgK0iEy0sMIE/mobilizing-a-country-wide-long-term-camera-trap-data-set-in-cambodia>. Highlight any additional documents, events, news items or links that you would like to add to your page.

WCS Cambodia's Media Officer will produce a number of press releases, social media, and website updates highlighting the project's success, and liaise with GBIF to ensure promotion of GBIF's goals and programs. The GBIF program will be credited in scientific and popular articles produced based directly on this project.

These media items will be produced in the second half of the project.

Mid-term evaluation findings and recommendations for the remaining project implementation period

This should be the main section of the report, covering for example:

- *An evaluation of the project activities by the mid-term and their outputs/deliverables*
- *Any feedback on the project's relevance from the partners and stakeholders*
- *Comments on the project implementation, its efficiency and effectiveness*
- *The management arrangements for the project, including support from the GBIF Secretariat*
- *Any reflection on the mid-term evaluation itself that could help inform the project's final evaluation and final report*
- *Areas of success to build on during the remainder of the project implementation*

This section is also an opportunity to draw out the main lessons from the project experience that could be applied in other contexts, including any best practice that others in the GBIF community could apply.

Try to clearly document any changes to the project plans that will be made based on the findings of the mid-term evaluation. Please discuss any substantial changes with the GBIF Secretariat (bifa@gbif.org). In addition, please outline any recommendations for the GBIF Secretariat or the community to reinforce the initial successes of the project.

The core part of this project, the standardisation of camera trap images, has progressed well, undertaken by WCS staff and supported by SFS students, and is ahead of the projected timeline. The format follows the Darwin Core, the Camera Trap Metadata Standard, with additional columns to capture project specific data.

As anticipated, data archives contain significant numbers of blank and setup images. Despite this, more than 16,500 species records have been obtained and standardised.

Students used on the project have benefited from technical learning, both general data cleaning processes as well as specific tools like OpenRefine and advanced Excel usage. With a few hours of training, students are able to accurately prepare large sets of data.

More than 10 different camera trap data management systems were assessed, ranging from technical complex but powerful systems such as CamtrapR, to web based user-friendly interfaces such as Aardwolf. TRAPPER was originally shortlisted as the most likely candidate, but Wildlife Insights (WI) was chosen for a number of reasons – WCS's participation in the development for one factor, as well as numerous technical advantages, including recent advances like machine vision for automatic species identification. This solution meets all the desired criteria, and provides tools and benefits not

previously considered in the criteria list – automatic analysis of federated data, for example. The launch of WI was originally timed for within the project period, but has been delayed until after the project end date. It would be ineffective and inefficient to adopt and train another solution in the short term, only to move to WI later. Instead, to ensure maximum benefits from this project, staff time previously allocated to training will be redirected to additional data processing, with the temporal period being extended from pre-2015 to include 2015-2018 data.

Given different hardware requirements for WI, the budget allocated for server procurement will be reallocated to laptops, which will support the additional data processing load of the revised activities.

A major, additional benefit of this project has been to provide data management and sharing capacity to WCS Cambodia, which has initiated wider conversations about data management and sharing across the program. Progress, albeit slow, is being made towards adopting standard practices across the program which reflect modern best-practice. This capacity has also allowed support to be provided to the Royal Government of Cambodia’s Ministry of Environment, who are having similar internal discussions about data management practices.

Annex – Sources of verification

Sources of verification are for example links to relevant digital documents, news/newsletters, brochures, copies of agreements with data holding institutions, workshop related documents, pictures, etc.



Figure 1. Field staff processing old datasheets and compiling image collections

