



BID Africa 2017 – National Grant Template

Final narrative report

Instructions

- Fill the template below with relevant information. **please indicate the reason of the delay and expected date of completion.**
- Use the information included in your project Full proposal (reproduced in annex III of your BID contract) as a baseline from which to complete this template
- The information provided below must correspond to the financial information that appears in the financial report
- Sources of verification are for example direct links to relevant digital documents, news/newsletters, brochures, copies of agreements with data holding institutions, workshop related documents, pictures, etc. **Please provide access to all mentioned sources of verification** by either providing direct link or sending a copy of the documents.
- This report must first be sent as a **Word document** to GBIF@GBIF.org and be pre-approved by GBIFS
- Once this report is pre-approved in writing by GBIFS, it must be signed by the BID project coordinator and sent by post to:

The Global Biodiversity Information Facility Secretariat (GBIFS)
Universitetsparken 15
DK-2100 Copenhagen Ø
Denmark

Template

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2. Project Information

2.1. Project Coordinator: Institution/network/agency name:

Livingstone Museum

2.2. Main contact person and role:

Clare Mateke – Project Lead

2.3. BID proposal identifier:

BID-AF2017-0301-NAC

2.4. Project title:

Mobilising Bat Occurrence Data in Zambia

2.5. Start date and end date of the reporting period:

1st October 2017 – 15th March 2019

2.6. Country in which the activities take place:

Zambia

3. Overview of results

3.1. Executive summary

Give a short summary of the activities implemented and the outcomes of the project for the reporting period (500 words maximum)

- 1) Two Research Assistants were recruited on 1st November 2017. They assisted with most activities and also participated in several training workshops.
- 2) The capacity self-assessment form was filled and submitted in November 2017. A second one is being submitted with this report.
- 3) A kick-off meeting was held on 9th November 2017 which produce a revised project schedule and responsibilities. Training plans, reporting criteria and deadlines were also discussed.
- 4) The Project Lead attended the GBIF Capacity Enhancement Workshop on Biodiversity Data Mobilisation in Cape Town from 4-7 December 2017. Much useful knowledge and new skills were learnt concerning project planning, digitisation, data cleaning and publishing of biodiversity data. New contacts were also made which proved useful during the project.
- 5) The Project Lead and two Research Assistants attended training workshops in Graphic Information Systems (GIS) and Molecular Methods in Portugal at the CIBIO In-Bio research centre and laboratory from 11-19th December 2017. Skills learnt were later put to use in the project when extracting tissue samples for molecular analysis and analysing the results.
- 6) An extensive list of literature on Zambian bats was compiled. This was used to extract occurrence data and to prepare an atlas of Zambian bats. It will also be used for a research paper on Zambian bats.
- 7) The Project Lead conducted a workshop on Biodiversity Data Mobilisation at the Livingstone Museum from 10-12 January 2018 to disseminate knowledge acquired at



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the GBIF workshop in Cape Town. Participants included 5 members of staff from Livingstone Museum and one from the Department of National Parks and Wildlife.

- 8) Experts from the Harrison Institute and Bats without Borders conducted a training workshop in bat identification and taxonomy at Livingstone Museum from 15-19 January 2018 for the Project Lead and Research Assistants. During the workshop identities of about half the bat specimens in the Museum were confirmed. The trainers also met with Museum staff to discuss future collaboration possibilities.
- 9) From January to May 2018 the project team checked and updated the species records for the Museum bat specimens.
- 10) From March to May 2018 the team collected tissue samples from 483 bat specimens which were sent for molecular analysis to CIBIO In-Bio in July to confirm species identities.
- 11) From February to March 2018 the team prepared a website to increase project publicity and improve networking and collaboration.
- 12) The Project Lead attended the GBIF Capacity Enhancement Workshop on Data Use for Decision Making in Cape Town from 9-13 April 2018. Useful skills relating to data use were acquired and new contacts made.
- 13) In May and June 2018 the team georeferenced, cleaned and transformed bat data from Livingstone Museum. The dataset was published on 10th June 2018 through the South African National Biodiversity Institute (SANBI).
- 14) Research institutions around the world were contacted to see if they had unpublished occurrence records of Zambian bats. Of the institutions that responded, 5 sent data that were not published and gave permission to publish them.
- 15) Attempts to collect occurrence data from research reports from the Department of National Parks and Wildlife failed as the reports were not digitised.
- 16) Occurrence records of Zambian bats were extracted from literature sources.
- 17) The data collected from other institutions and literature were georeferenced, cleaned and transformed then published through SANBI on 6th November 2018.
- 18) A research student from University of Stirling provided data on bat occurrence records obtained from fieldwork. The data was cleaned and transformed, then published on 18th February 2019.
- 19) The same researcher agreed to provide call data, but these are still being sorted.
- 20) Of the tissue samples sent for molecular analysis, 173 specimens were processed through a metabarcoding approach, consisting of the sequencing of a COI fragment and then comparing obtained sequences with a reference library. Out of these, 29 species were successfully identified. However, it was not possible to determine the specimen identification to species level of ca. 50% of the samples, especially for the *Epomophorus* genus where this molecular marker did not possess a strong power of taxonomic discrimination. Therefore, the results highlight the need to pursue cataloging and to build molecular reference libraries for African bats, as well as testing of more discriminatory molecular markers.
- 21) Two training workshops in Geographic Information Systems (GIS) were held in Livingstone and Kitwe (Zambia) from January to February 2019. 24 people were trained from three institutions.





- 22) Work started on an atlas of Zambian bats, however, due to delays in publishing occurrence datasets, it could not be completed by the end of the project.
- 23) A meeting for stakeholders was held in February 2019 in Lusaka, Zambia. 26 people. Project outcomes were presented and discussions held on setting up a national biodiversity information facility.
- 24) The major outcomes of these activities are as follows:
1. 25 people trained in geographic information systems
 2. 3 people trained in basic molecular methods and bat identification and taxonomy
 3. 6 people trained in biodiversity data mobilisation
 4. 1 person trained in data use
 5. Project team members had the opportunity to network with other project leaders, participants, mentors, trainers and project partners.
 6. Over 400 literature records on Zambian bats collated
 7. Data quality of occurrence records of nearly 600 bat specimens in Livingstone Museum improved
 8. Project publicity improved through creation of a website.
 9. 26 people from 15 institutions informed about outcomes of the project and encouraged to mobilise biodiversity data.
 10. Discussions begun on possibility of establishing a national biodiversity facility
 11. 3 occurrence datasets published to GBIF, making a total of 2,338 records.
 12. Progress made on the creation of an atlas of Zambian bats.

3.2. Progress against expected milestones:

Give an overview of all the expected milestones for your project from the beginning until now (see Annex V of your contract)

Expected milestones/activities	Completed? Yes/No	Explanatory notes	Sources of verification
Completed capacity self-assessment questionnaire for national biodiversity information facilities https://www.gbif.org/document/82277/capacity-self-assessment-guidelines-for-national-biodiversity-information-facilities (EN) https://www.gbif.org/document/82782/auto-evaluation-des-capacites-pour-les-systemes-nationaux-dinformation-sur-la-biodiversite (FR) <i>(Early Progress report</i>	YES		Submitted to GBIF



milestone)			
At least one national data publishing institutions are registered with GBIF.org Guidelines to become a publisher: https://www.gbif.org/become-a-publisher (Early Progress report milestone)	YES	Livingstone Museum was registered and endorsed	Visible as a publisher on GBIF website
At least one person from the project team has completed the certification process following the BID Capacity Enhancement workshop on Data Mobilization organized as a part of the BID programme Africa 2015 or BID programme Africa 2017 (Early Progress report milestone)	YES	Workshop attended. Assignments completed.	Workshop photos at: https://www.flickr.com/photos/44353813@N02/sets/72157667087850829/page3 . Assignments submitted through e-learning portal. Advanced digital badge received from GBIF.
Knowledge dissemination activities have been scheduled following the first BID Capacity Enhancement workshop (Early Progress report milestone)	YES	Carried out dissemination workshop for staff and one project partner. Dropbox with resources shared with collaborating partners.	Training report submitted
At least one dataset has been published to GBIF.org (Midterm report milestone)	YES	SANBI provided access to an IPT.	First dataset "Livingstone Museum Bat Collection" was published in June 2018
The data users identified in the full proposal have documented their intended use of the mobilized data and provided early feedback (Midterm report milestone)	NO	Discussions with the Department of National Parks and Wildlife are underway. Meanwhile, Bats without Borders and Livingstone Museum are ready to work on the Zambian Bat Atlas as soon as the datasets are published.	
All mobilized data have been published to GBIF.org (Final report milestone)	YES	Three datasets have been published to GBIF, making up a total of 2,338 occurrence records	See links to datasets in section 3.4
All published data meet the minimum requirements outlined in the Data Quality Requirements available at https://bid.gbif.org/en/community/data-quality/ (Final report milestone)	YES	All data was georeferenced, cleaned and transformed to meet Darwin Core standards before publishing. All the required fields were included in the datasets and all records included coordinates. Much additional data were also included.	See links to datasets in section 3.4



<p>The training outcomes of the project have been documented, including the number of people receiving certification through the BID Capacity Enhancement workshops, the number of people trained in nationally organized events, and the evaluation of the impacts of these training activities</p> <p>(Final report milestone)</p>	YES	<p>Training reports have been prepared for each training activity. Information about each event has been uploaded on the GBIF BID project page as well as the in-house project website.</p>	<p>Training reports submitted to GBIF</p>
<p>Final capacity self-assessments for national biodiversity information facilities have been completed with sustainability plans.</p> <p>https://www.gbif.org/document/82277/capacity-self-assessment-guidelines-for-national-biodiversity-information-facilities (EN)</p> <p>https://www.gbif.org/document/82782/auto-evaluation-des-capacites-pour-les-systemes-nationaux-dinformation-sur-la-biodiversite (FR)</p> <p>(Final report milestone)</p>	YES	<p>Final assessment completed after discussions during stakeholder workshop. Plans are underway for further discussions on the way forward</p>	<p>Submitted to GBIF</p>
<p>All uses of the mobilized data have been documented</p> <p>(Final report milestone)</p>	YES	<p>Progress on data use activities was delayed by the delay in publishing biodiversity datasets. However, work was started on an atlas of Zambian bats. It is hoped it will be completed by the third quarter of 2019 and will then be made freely available to researchers and other potential users.</p> <p>Plans are also underway to prepare a scientific paper on Zambian bats using the collated literature and the mobilised data.</p>	<p>Draft atlas of Zambian bats submitted</p>
<p>Best practices and lessons learned have been documented</p> <p>(Final report milestone)</p>	YES		<p>List of best practices and lessons learned submitted</p>

3.3. Project deliverables and activities

Refer to the table in section 2.2 “Deliverables, activities and reporting criteria” of your BID full proposal. Provide updates on the status of each of planned deliverables. In the event of unexpected delay, please provide detailed explanatory



notes and indicate planned completion date. Add as many rows as needed.

Deliverable	Related activity	Completed ? Yes/No	Explanatory notes	Sources of verification
Two research assistants recruited	Recruitment of research assistants	Yes	Advertisements sent out, applications received, interviews conducted, 2 research assistants recruited on 1 st November 2017.	Interview report
Project roles, responsibilities and timescales agreed at kick-off meeting	Kick-off meeting	Yes	One staff member from Bats without Borders met with Livingstone Museum staff to discuss project logistics, training plan, assignment of reporting duties and deadlines	Meeting minutes Detailed roles/ responsibilities and Gantt chart with timeline
Tissue samples collected from existing museum specimens and core team (3 people) trained in basic molecular methods to verify species identification.	Molecular training and analysis	Yes	CIBIO-InBIO provided introductory training to core team in molecular methods. 483 tissue samples were extracted from the bats in the Livingstone Museum collection.	Training report List of tissue samples collected
Core team trained in GIS and data mobilisation methods	Core team GIS training workshop	Yes	CIBIO-InBIO and Bats without Borders provided training to core team in geographic information systems.	Training report
List of Zambian bat research literature documented	Bat literature collation	Yes	List of literature on Zambian bats was compiled	List of Zambian bat literature
Core team (1 researcher and 2 research assistants from Livingstone Museum trained in bat identification by morphological methods	Bat identification training workshop	Yes	Two other staff members joined in for part of the training. In addition to training on identification of museum bat specimens, the team carried out one day of field work to supplement the training.	Training report
Record of bat collections in the Livingstone Museum taxonomically updated and expanded to include morphometric data.	Update Livingstone Museum specimen data	Yes	Remaining records of bat specimens were digitised. Bat morphometric data was collected and the taxonomy of the specimens was updated in line with most recent taxonomic information.	Livingstone Museum bat collection fully digitised and taxonomically updated using morphometric data.



Digital record of Zambian bat occurrence data held by museums outside of Zambia and research carried out in Zambia	Collation of additional Zambian bat records	Yes	About 20 institutions around the world were contacted to ask if the project can publish their data relating to Zambian bat specimens. Five institutions sent data and agreed to have it published. One additional institution sent occurrence data for use in the bat atlas and bat paper but not to be published directly as occurrence data.	List of institutions contacted and those that sent data. Dataset "Zambian bat collections worldwide" (see link in section 3.4) showing various data sources published to GBIF.
Occurrence dataset for ~500 bat specimens from Livingstone Museum; and 900 (bats caught) plus ~1000+ (acoustic data) occurrence records from the University of Stirling published online. (Total of over 2,400 occurrence records). Species occurrence data obtained from other institutions (museums and researchers) published online, where not already done so.	Transforming, uploading and publishing occurrence data	Almost complete	585 occurrence records of bat specimens from Livingstone Museum published to GBIF. 780 occurrence records from bats caught in Zambia during research under Stirling University project published to GBIF. 973 occurrence records from literature and other institutions published to GBIF. Occurrence records from acoustic data still to be cleaned, transformed and published.	3 datasets published to GBIF by Livingstone Museum (see links in section 3.4)
Sequenced "DNA barcode" for Zambian bat specimens published online.	Creation of DNA Library	Partly	173 specimens have been sequenced for the COI fragment. The data were generated and used to identify species/genus through BLAST. However, it is not yet validated to be submitted to public databases. Only through subsequent sequencing of another molecular marker we will be able to obtain robust enough results to submit them to online libraries.	
Zambian bat call library initiated and published online.	Creation of call data library	No	Still awaiting digitisation and analysis of data from researcher	
Three workshops in Geographic Information Systems (GIS) and georeferencing techniques conducted	General GIS training workshops	YES	Two workshops in Geographic Information (GIS) Systems were conducted in Livingstone and Kitwe, incorporating 24	Training report Documentation and photos on GBIF BID project page under



in Livingstone, Lusaka and Kitwe.			participants from the coordinating institution and two national project partner institutions	events (https://www.gbif.org/project/32mmLbZEtqiGQgiayAg6Q/mobilizing-bat-occurrence-data-in-zambia#news)
Species distribution maps for Zambian bats produced (including existing data available online and new data published during this project)	Bat maps	Partly	Since progress on the maps had to wait for publishing of the third dataset, which was only completed in February 2019, preparation of the maps has not yet been completed. It is hoped they will be completed by the end of April 2019.	Draft bat atlas
Zambian bat atlas	Bat atlas	Partly	Preparations on the bat atlas were started, and draft write-ups for most species were complete. However, completion of the atlas is awaiting completion of the species maps and consultation with experts on particular taxonomic issues. It is hoped the atlas can be completed by the third quarter of 2019.	Draft bat atlas
'Bats of Zambia' paper written and submitted for publication	Zambian bats paper	No	Although an extensive list of literature was compiled, not much work has yet been done on the paper due to other activities running late. It is hoped the paper can be completed and published before the end of 2019.	
Stakeholder conference held in Zambia	Stakeholder conference	Yes	The meeting was held in Lusaka on 27 th February and was attended by 26 people from 15 different institutions	Meeting report Attendance list Documentation and photos on GBIF BID project page under events (https://www.gbif.org/project/32mmLbZEtqiGQgiayAg6Q/mobilizing-bat-occurrence-data-in-zambia#news)
Evaluation and reporting meeting held	Evaluation and reporting meeting	Yes (informal)	It was decided that a formal meeting was unnecessary	





at Livingstone Museum			and time was not available. Although a formal meeting was not conducted, informal discussions were held between the project coordinator and some of the project partners during the GIS training workshops to discuss the way forward with the reporting process.	
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3.4. Datasets published on GBIF.org

Refer to the table in section 2.4 “Biodiversity data mobilization plan” of your BID full proposal. If the dataset is not yet published, please indicate the name of the institution that is expected to host the data when published in the column “DOI or URL/Planned hosting institution”. Add as many rows as needed.

Dataset title	Publishing institution	DOI or URL/Planned hosting institution	Date/expected date of publication	Explanatory notes
Livingstone Museum Bat Collection	Livingstone Museum	https://doi.org/10.15468/i6cor7/South African National Biodiversity Institute (SANBI)	Published 10 th June 2018	585 occurrence records
Zambian Bat Collections Worldwide	Livingstone Museum	https://doi.org/10.15468/dfc4dv/South African National Biodiversity Institute (SANBI)	Published 6 th November 2018	973 occurrence records
Bats in Zambia Project	Livingstone Museum	https://doi.org/10.15468/q4updn/South African National Biodiversity Institute (SANBI)	Published 18 th February 2019. Revised version published 5 th March 2019	780 occurrence records
Bats in Zambia Project Acoustic Data	Livingstone Museum	South African National Biodiversity Institute (SANBI)	Plan to publish the dataset by end of 2019.	
PLANS BEYOND THE TIMELINE OF THE PROJECT				
Livingstone Museum Bird Collection	Livingstone Museum	South African National Biodiversity Institute (SANBI)	Plan to publish dataset by mid-2020	About 10,000 occurrence records
Livingstone Museum Small Mammal Collection	Livingstone Museum	South African National Biodiversity Institute (SANBI)	Plan to publish dataset by end of 2020	About 3,000 occurrence records

3.5. Examples of use of biodiversity data available through GBIF

Data mobilised through the BID programme, ultimately, should guide natural resource conservation and management policy. We require you to report on how you have integrated these data into these policy-making processes. You may want to refer to the section 2.5 “Plan to support the integration of biodiversity information into policy and decision-making process” of your original proposal as a reminder of your original commitments.

As part of that process, we request you to provide us with a summary of how you have used these data within the decision-making process and we have included some guiding questions below to help with that process. Please note that if your dataset has been combined with other datasets in analyses that guide the decision-making process, then this should be recorded too.

Description

Has your project been successful in integrating data within the policy-making process?

Not yet

Where did the demand for these data come from?



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If yes, which policies have been developed using your data?

If no, what were some of the challenges you faced in getting your data into those processes?

Due to the delays in mobilising the biodiversity datasets during the project, the team did not manage to make much progress in integrating data within the policy-making process.

Did you have a biodiversity data integration plan from the beginning of your project? If so, did you have to adapt your plan as the project progressed and why did you have to make those alterations?

Unfortunately, not many activities concerning data use were included in the main deliverables of the project, and therefore it was not easy to add them at a later stage due to limited time and available funding. However, three activities did concern data use. These were creation of an atlas of Zambian bats using the mobilised data. This activity is in progress. The second was holding of a stakeholder meeting. This was done and stakeholders were made aware of the mobilised data as well as other data available from GBIF. It was found that very few of the participants were aware of this available data.

In what format are your data being used i.e. what were the analyses, if any, that you needed to perform on the data to ensure that they was in a format accessible to policy-makers?

In the bat atlas that is being prepared the data is being put into map format showing the distribution of each species within Zambia, as well as providing accompanying information about each species. This will make it easier for researchers, planners and policy-makers to better understand bat distribution in Zambia and to identify possible species at risk and those that require more protection.

What level of communication has there been with the relevant policy stakeholders i.e. by which means? With what regularity? And, how critical have these interactions been for the development policy-relevant analyses?

The main communication that took place was through the stakeholder meeting that was held at the end of the project period. Major policy-makers and potential biodiversity data users were present and it is hoped that this will result in use of the data in the near future.

What additional support (resources, tools, network, training) would be needed for your project to ensure the flow of information from mobilisation to decision-making?

A few people have already been trained in data mobilisation and also in data use and use of geographic information systems. These people can be used to share their newly acquired knowledge with others. However, there may be need for more resources to enable such training to happen quickly and on large scale.

How would you improve on your own processes in the future to improve data integration in the future?

The coordinating institution will make every effort to use whatever resources are available to make the mobilised data more accessible to researchers and policy-makers by presenting it in different forms such as maps and reports in order to encourage more use of the data. The coordinating institution will also endeavour to continue to work with cooperating partners, particularly the Department of National Parks and Wildlife and Bats without Borders to find other ways of making use of the data and ensuring that it reaches the right people/offices in a format that is easily understandable.

Data may serve other purposes other than for policy-making and these are as valuable. How was your data used for other purposes e.g. development of training materials, scientific publications, communication activities etc?



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Due to the reasons given above, the data has not yet been used in these ways except through the stakeholder meeting. However, as soon as the bat atlas is produced, it will be made freely available and publicised to researchers and other potential users. A scientific paper on Zambian bats will also be produced that will make use of the mobilised data. One thing that working on the bat atlas has shown is that there is still a great shortage of available occurrence data on Zambian bats. Therefore, efforts will be made to promote and encourage more research in this area.

Supporting materials

As part of our reporting, we request you to provide us with a copy of any materials highlighting data use on your dataset, either on its own or in combination with other datasets. This could be in the form of:

- Reports – governmental, ministerial, non-governmental organisations, international policy-making bodies
- Policy briefs
- Scientific publications
- Outputs from analyses that will be used in the future e.g. species distributions maps and other spatial analyses
- Education/communication materials

Please provide a valid dataset to the doi. Where the doi is not known, please state why.

Name of resource	Type of resource i.e. report, policy brief, scientific publication, analysis output, education materials, communication materials, other (please specify)	Dataset doi	Link to document or publication citation
Presentation on project outcomes (given at stakeholder meeting)	Education/Communication materials	10.15468/i6cor7; 10.15468/dfe4dv; 10.15468/q4updn	Submitted presentation
Zambian bat atlas (with species distribution maps)	Scientific publication	10.15468/i6cor7; 10.15468/dfe4dv; 10.15468/q4updn	In progress (submitted draft document)
Zambian bat paper	Scientific publication	10.15468/i6cor7; 10.15468/dfe4dv; 10.15468/q4updn	In progress

3.6. Events organized as part of the project

List all the events that have been organized as part of your project. Please provide links to any documents or webpages documenting the use in the “Sources of verification” column. Add as many rows as needed.

Full title	Organizing institution	Dates	Number of participants	Sources of verification
Kick-off meeting	Livingstone Museum	9 th November 2017	7	Minutes
GIS Training Workshop	CIBIO In-BIO/Bats without Borders	11-17 December 2017	3 trainees + 2 trainers	Training report
Molecular Methods Training Workshop	CIBIO-In-BIO	12-19 December 2017	3 + 5 trainers	Training report
Biodiversity Data Mobilisation Dissemination	Livingstone Museum	10-12 January 2018	6 participant + 1 trainer	Training report



Workshop				
Bat Identification and Taxonomy Training Workshop	Harrison Institute/Bats without Borders	15-19 January 2018	5 trainees + 2 trainers	Training report
Collaboration meeting	Harrison Institute/Bats without Borders/Livingstone Museum	18 January 2018	8	Minutes
GIS Training Workshop (Livingstone and Kitwe)	Bats without Borders/CIBIO-InBIO/Livingstone Museum	29-30 January 2019/ 31 January – 1 February 2019	24	Training report
Stakeholders' Meeting	Livingstone Museum	27 February 2019	26	Meeting report





4. Updated calendar for the BID project implementation and evaluation period

The calendar should be completed in the same way as in the Full Project Proposal, but should include any expected changes. Provide reasons for any expected changes in section 4.1 'Explanatory Notes'.

Implementation period start date and end date (dd/mm/yy)																		
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	15	15	16	17	Notes
Recruitment of research assistants	X	X																Done
Fill capacity self-assessment forms		X																Done
Kick-off meeting		X																Done
BID Capacity Enhancement workshop – data mobilization and publication			X															Done
Molecular training and analysis/Core team GIS training workshop			X	X	X	X												Done
Zambian bat literature collation			X	X	X	X	X	X	X	X	X	X	X					Done
Dissemination workshop on data mobilisation and publication				X														Done
Bat identification training workshop				X														Done
Early Progress evaluation & Reporting				X														Done
Update Livingstone Museum specimen data				X	X	X												Done
Collation of additional Zambian bat records				X	X	X	X	X	X	X								Done
BID Capacity Enhancement workshop – Data use							X											Done
Creation of DNA Library for Zambian bats													X	X	X	X		In progress
Transforming, cleaning and publishing specimen occurrence data					X	X	X	X	X	X	X	X	X	X	X	X	X	Done
Mid-term evaluation & reporting								X	X	X	X							Done
General GIS training workshops																X		Done
Creation of call data Library																	X	In progress
Preparation of maps and atlas for Zambian bats													X	X	X	X	X	In progress
Preparation of Zambian bats paper														X	X	X		In progress
Stakeholder meeting																	X	Done





Evaluation period start date and end date (dd/mm/yy)				
Activity	1	2	3	Notes
Evaluation and reporting meeting	X			Done
Final evaluation and reporting	X	X	X	Done

4.1. Explanatory notes:

1. Updating Livingstone Museum specimen data took longer than expected, which led to delays in collecting tissue samples for molecular analysis.
2. There were delays in sending the tissue samples for molecular analysis caused by delays in acquiring export permits. This caused a delay in starting the analysis. Technical issues were also faced during the molecular analysis, leading to further delays. As such, the first results were only received in January 2019 and it was recognised that further analysis was required.
3. The general GIS Training Workshops could not be held at the planned time in mid-2018 due to all the parties involved not being available at the same time. As such, the workshops were postponed several times and only finally held at the end of January 2019.
4. The Stakeholder meeting could only be held after most of the other activities were complete, as its main purpose was to report the outcomes of the project. As such, it was only held in February 2019.
5. Georeferencing and cleaning of the occurrence data took much longer than estimated, largely due to the inexperience of the team in the processes involved. Much of the data in the first two datasets did not have coordinate data, so these had to be derived from locality data.
6. The maps for the bat atlas could not be created until most of the datasets had been published, this led to delays in creating the maps. However, in the meantime, work on the species descriptions was done.
7. Call data expected from one of the project partners could not be obtained in time before the completion of the project due to other commitments by the researcher involved. It is hoped it can be obtained in the next few months and then published in some useful format.
8. Work on the Zambian bat paper could not make much progress due to the various other delays in the project and ongoing activities.



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5. Sustainability plans

Explain the approach that will be taken to ensure the sustainability of the project's results after the end of your project (500 words maximum)

There are still a number of activities that were targeted within the project that have not been completed.

These are:

1. Publish occurrence dataset from bat acoustic data
2. Create a bat call library from acoustic data
3. Create and publish an atlas of Zambian bats
4. Publish a paper on Zambian bats using available literature
5. Carry out more extensive molecular analysis on samples from Livingstone Museum bat collections

There are also activities that were targeted beyond the timeline of the project.

1. Mobilise occurrence records of about 3,000 mammal specimens in the Livingstone Museum
2. Mobilise occurrence records of about 10,000 bird specimens in the Livingstone Museum

There are further plans that have come out of the project, such as making progress towards developing a national biodiversity information facility.

Plans for some of these activities have been included in 2019 work plans for Livingstone Museum staff, including preparing for mobilising of occurrence records of birds and other mammals, completing the bat atlas and the Zambian bats paper.

Project partners Bats without Borders and Stirling University have plans to continue digitising the acoustic data in preparation for publishing before the end of the year, and creating a bat call library, while project partner CIBIO-InBio have plans to carry out more extensive molecular analysis on the Livingstone Museum bat tissue samples to get more accurate identifications for some specimens.

Meanwhile, the project leader has been tasked to coordinate the team assigned to look into developing a national biodiversity information facility.

The project leader and coordinating institution will ensure that it takes a lead in ensuring that these various tasks are completed in reasonable time. The project leader will also make efforts to continue networking with other stakeholders and encouraging the mobilisation of more biodiversity data from Zambia.

The molecular analysis showed that there is a great shortage of genetic reference material available on Central African bats, making it difficult to confirm the identities of museum specimens and tissues taken from live bats during research. Discussions will





therefore continue between Livingstone Museum, Bats without Borders, Stirling University and CIBIO-InBio on how to get more bat species sequenced to provide adequate reference material. Since many bat species are very difficult to distinguish morphologically, this is an important part in determining distribution of cryptic species.

During preparation of the atlas of Zambian bats it was realised that even after publishing these 2,000+ occurrence records, there is still a huge paucity of information on distribution of bats in Zambia. There is therefore a need to carry out more field work in this area. The Livingstone Museum and some of the other project partners will therefore make it one of their priorities to ensure that more fieldwork on bat distribution in Zambia is carried out as soon as possible. The completion of the atlas will show exactly where the gaps in localities and in species data are, which will help prioritise this research.

6. Beneficiaries/affiliated entities and other cooperation

6.1. Relationship with project partners

Please describe the relationship between your project coordinating team/institution and your project partners, and with any other organisations involved in implementing your BID project.

The relationship with project partners has generally been good and productive. Local project partner Copperbelt University, helped advertise for the research assistant position for the project, which resulted in good candidates for recruitment.

For the workshop organised by the Project Co-ordinator to disseminate knowledge gained during the BID Biodiversity Data Mobilisation workshop in South Africa, one participant was invited from local project partner Department of National Parks and Wildlife.

International project partners, including Bats without Borders, CIBIO-InBio (University of Porto) and the Harrison Institute have provided capacity building in form of several training workshops, both in and outside the country. There have also been fruitful discussions concerning ways of increasing the publicity about the project and future collaboration ideas.

Contacting other institutions in relation to unpublished biodiversity data created new links with other biodiversity research institutions, which are likely to lead to improved collaboration and networking in future. A few institutions did not have their data digitised yet but promised to make it available when it is.

There was some difficulty coordinating the GIS Training Workshops between three institutions and 2 training partners, but they eventually took off successfully and created new links and networks.

The stakeholder meeting was a great chance for representatives from the coordinating institution and three project partners to meet with other stakeholders and discuss future plans for mobilising more biodiversity data. The fact that a number of people had already been trained in biodiversity data mobilisation and other skills was shared and institutions were encouraged to make use of the trained staff as they start planning to mobilise their data. A team comprising six stakeholder institutions was formed that would look into the way forward concerning creation of a national biodiversity information facility



6.2. Links to other projects and actions

Where applicable, outline any links and synergies you have developed with other actions, e.g. GBIF nodes, other BID funded projects, etc. If your organization has received previous grants in view of strengthening the same target group, to what extent has your BID project been able to build upon/complement the previous project(s) ?

Discussions with representatives from the South African National Biodiversity Institute (SANBI) led to SANBI setting up an IPT for the Livingstone Museum to publish its datasets. Since then, three datasets have been successfully published using the IPT. Technical support from the hosting institution has generally been swift and adequate.

The Project Leader benefitted from meeting with other project leaders, mentors, trainers and GBIF personnel during the Biodiversity Data Mobilisation workshop and the Data Use of Decision Making workshop, both held in Cape Town, South Africa. These links are likely to prove useful in future, both within and beyond the project period.

As a result of the BID project, the project leader was invited to attend a GBIF Node Mangers' meeting in Tanzania in August, resulting in increased opportunities for networking through GBIF and increased understanding of how nodes operate.

7. Visibility

Please refer to the [BID guidelines](#).

7.1. Visibility of the BID project

How is the visibility of your BID project being ensured?

Short summary

The project has been publicized through the Project Co-ordinator's (Livingstone Museum) Facebook page

Project partners Bats without Borders, the Harrison Institute and CIBIO have also publicized the project through their websites and social networks

Information has been sent to BID to update the project website on GBIF

An independent project website has been created in order to improve publicity about the project. The link has been shared with all project partners.

Sources of verification

<https://www.facebook.com/livingstone.museum/>

<http://www.facebook.com/batswithoutborders/>

<https://www.gbif.org/project/32mmLbZEtqiGQgiayAg6QQ/mobilizing-bat-occurrence-data-in-zambia>

<https://batprojectzambia.wordpress.com>

<https://cibio.up.pt/projects-1/page/563>

<https://www.facebook.com/Harrison-Institute-Centre-for-Biodiversity-Research-193357067346886/>

7.2. Visibility of the EU contribution

How is the visibility of the EU contribution being ensured within your project implementation?



This programme is funded by the [European Union](#)



Short summary

The EU logo has been used throughout the project in public communications, presentations and reports wherever possible and stating that the BID programme is being funded by the European Union.

Sources of verification

Training reports and other reports and verification documents sent with all early, mid-term and final reports

<https://batprojectzambia.wordpress.com>

<https://www.facebook.com/livingstone.museum/>

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Signature _____

Name of the contact person for the BID Project: _____ Clare Mateke _____

Date report sent by email in Word format to bid@gbif.org for pre-approval: _17 March 2019_

Date report sent by post to GBIF Secretariat: _____



This programme is funded by the [European Union](#)