

Capacity development for mobilization and use of Biodiversity Information Development (BID) data on endangered bird species in Kenya

Programme:BID

Project ID: BID-AF2020-014-NAC

Project lead organization:Strathmore University

Project implementation period:5/4/2021 - 30/4/2023

Report approved: 15/5/2023

Final Narrative Report

Executive Summary

The 2-year duration of this BID project was from 5th April 2021 to 30th March 2023.

The project completed training sessions (TOTs) on data mobilization and uses of data from the GBIF portal for publishing of journal articles and policy briefs. This was accomplished through research training of graduate students, at PhD and masters level, working with conservation managers and early career researchers. Major achievements of the project included use of GBIF-mediated data to write manuscripts for original journal articles and policy briefs in a co-created manner with graduate students, early career researchers, and conservation managers. For the first time in Kenya PhD and MSc students were able to write the thesis from repository biodiversity data from the GBIF database. Training Manuals were developed including Biodiversity data digitization and publishing on GBIF IPT and a Protocol for collecting policy-relevant biodiversity data through citizen science to advance further training after the lifetime of the project. Two BID project partners successfully went through the virtual data mobilization and were awarded biodiversity data mobilization badges. The project was able to mobilize and publish 11,699 occurrence records out of the expected 66,000. We faced a major challenge in data mobilization as most data owners were unwilling to share data in their custody onto the repository. Four owners were not able to give their data for publishing despite multiple engagements and negotiations. We consider this as a major challenge to data mobilization in Kenya and there is a need for further engagement with data owners to understand this level of unwillingness to share data. However, the project made significant achievement in capacity building of graduate students, early career researchers and conservation managers through the use of data to publish journal level articles, policy briefs and presentation at conferences. We developed for the first time scientific papers on raptors and vultures on their distribution and conservation implications in Kenya. Graduate students effective engagement and partnership with the Universities where they are registered for the graduate studies. The project produced the first policy brief on development for bird friendly powerlines in Kenya by overlaying the niche of raptors and the network of the high voltage powerlines. Also key is the output on the association of the Rulle's vulture habitat niche and the protected areas in Kenya, information now described in a policy brief for improving conservation areas for the critically endangered species. Overall this project has brought to knowledge information on conservation practice for endangered birds species, including species of concern Rupelle's vulture and Grey crowned cranes. We have build capacity of Kenyan students at PhD and masters level on ecological niche modeling, professional-level scientific writing and policy brief development and founded the Center for Biodiversity Information Development (BID-C) at Strathmore University to continue with promoting biodiversity conservation research on data mobilization and use. We are confident with the level of success we have made in this project.

Progress against milestones

Has your project completed all planned activities?: Yes

Has your project produced all deliverables: No

Rationale:Data Mobilization: We have had a challenge with data owners on endangered bird species due to change in their data policy (evidence emails attached). The project requested and extension of One-month beyond the March 30th reporting in anticipation of more datasets for Grey crowned crane and Sharpe's Longclaw. Unfortunately, the data owners became unwilling to share their datasets. We have attached some of the correspondence with data owners in the appendices section. Therefore, we were not able to meet the target 66000 records. We consider unwillingness of data owner to share data on endangered species as one of the major challenges we faced.

Publishing of Articles and Policy Briefs: Publishing of peer review articles has taken time due to the quality of output expected for PhD and MSc level research and the level of statistical analysis and quality writing. This was the most intense part of the project, but most impactful and rewarding.

Report on Activities

Summary of the implementation of the project activities

Logical planning was successful and the call for admitting the fellows attracted 37 applicants -- 15 were selected into the programme, 5 conservation managers, 5 early career scientists and 5 graduate students. One graduate student dropped out of the programme.

Training manuals were developed on biodiversity data mobilization and publishing on GBIF IPT and another manual on protocol for collecting policy relevant biodiversity data. These were used in training during TOT-I.

Data mobilization was successful to a limited extend, publishing 11699 records. The delivery was limited by unwillingness of data owners. We consider unwilling to share data on endangered species or any other biodiversity data. This frustrated our effort in mobilizing data. We were not able to mobilize data beyond these records even after requesting extension and engaging more data owners who were still not willing to share data (as reported to GBIF staff directly).

TOT-II workshops and research writing sessions were successfully conducted and the engagement with fellows in publishing process continued beyond the sessions due to the rigor involved. This process is fulfilling and successful but is a slow process due to the rigor involved in the manuscript preparation and publishing process. 1 Policy brief has been published, 1 policy brief is near complete, 1 policy brief is delayed. 1 manuscript submitted to a journal and is under review, 1 manuscript is complete, 2 manuscripts delayed. We wish to continue with publishing the manuscripts and the policy brief after this reporting.

One new activity has emerged, we proposed a symposium at the upcoming ICCB conference in Rwanda where papers from the project will be presented and we discuss the challenge of biodiversity data sharing (#28 Leveraging Biodiversity Data for Conservation in Kenya). We request this be considered and be supported by the third remittance to be applied and any funds saved at each budget line.

Completed activities

Activity: Logistical Planning-1

Description: Project Team Planning Meetings
Development and release of Call documents for BID Fellows
Shortlisting and selection of BID Fellows 2021
Development of training manuals for TOT I-1 on data mobilization and identification of data sources

Start Date - End Date: 24/3/2021 - 10/5/2021

Verification Sources: Meeting documents, the release of call for BID fellows

Documents shared in mid-term report
Participants list in the word format report attached

Activity: Logistical Planning and facilitation ahead of TOT I-1

Description: This involved logistical Planning for Accommodation, transport and workshop administration

Start Date - End Date: 10/5/2021 - 21/5/2021

Verification Sources: meeting report

Activity: Virtual Data Mobilization Course

Description: 03-14 MAY: preparatory course activities (online self-paced; Section I)
18-21 MAY: virtual workshop (Zoom sessions and online self-paced; Section II)
24 MAY - 27 JUNE: certification exercises (online self-paced; Section III)

Start Date - End Date: 3/5/2021 - 27/6/2021

Verification Sources: Records at GBIF on the training sessions

The course was attended by:

1. Dr. David Chiawo
2. Dr. Libby Ellwood

Successful and awarded biodiversity data mobilization badges

Activity: TOT I-1

Description: Workshop on Data Mobilization

The 4 days' workshop was conducted at Strathmore University.

Model of delivery:

The TOT adopted a hybrid model for BID Fellows and facilitators who were unable to physically participate but engage via the virtual platform

Start Date - End Date: 24/5/2021 - 27/5/2021

Verification Sources: Mid-term report attendance documents/ time table/photos

Activity: Data publishing

Description: Raptors Occurrence Data in Kenya

Data Source: Peregrine Fund

(The Global Raptor Impact Network)

<https://doi.org/10.15468/m8jxcu>

Records =11,699 occurrences

Start Date - End Date: 27/5/2021 - 30/11/2021

Verification Sources: <https://doi.org/10.15468/m8jxcu>

Activity: TOT II-1

Description: Training on publishing peer-reviewed papers from BID data for the 1st cohort.

Training on publishing conservation policy briefs from BID data for the first cohort

Start Date - End Date: 2/8/2021 - 5/8/2021

Verification Sources: Time table/attendance records (Submitted in mid-term reporting)

Sign-up sheets

Activity: Logistical Planning-2

Description: BID project implementation and reporting - live Q&A session 19th January 2023

Project Team Year 2 Planning Meetings

Start Date - End Date: 19/1/2022 - 19/3/2022

Verification Sources: Meeting notes/zoom link

Activity: TOT I-2

Description: Practical workshop on Data Mobilization: Data digitization and development of manuscripts.

The 4 days' workshop was conducted off-campus in Naivasha, Kenya.

Model of delivery: The TOT required full physical participation and the BID fellows and facilitators were facilitated to ensure they were able to participate fully to achieve the projected deliverables.

During the workshop, all 4 BID MSc and PhD fellows were able to participate and were able to fully develop their first complete drafts of their policy briefs and manuscripts.

Start Date - End Date: 28/6/2022 - 1/7/2022

Verification Sources: TOT I-2 time table

Sign-up sheets

Photo evidence

Activity: TOT II-2

Description: Practical workshop on Data Mobilization: Data digitization and development of manuscripts and Policy Briefs.

The 4 days' workshop was conducted off-campus in Amboseli, Kenya.

Model of delivery: The TOT was held in hybrid model to enable the facilitators and Fellows who were not able to travel to participate. The BID fellows and facilitators were facilitated to ensure they were able to participate fully to achieve the projected deliverables.

During the workshop, 3 BID MSc and PhD fellows were unable to participate physically and 1 student joined virtually. The students were able to complete their policy briefs and manuscripts.

Start Date - End Date: 16/11/2022 - 19/11/2022

Verification Sources: TOT 1-2 time table/attendance records.

Activity: Manuscripts and Policy Briefs Development

Description: Peer Reviewed Articles Development & status:

A. Journal papers completed - Publishing process in progress

1. Distribution and predictive niche modeling of five endangered raptors species; are protected areas effective for raptor conservation in Kenya?

Ngila, Peggy-PhD fellow; submitted-under peer review- (submission correspondence attached).

2. Niche distribution pattern of Rüppell's vulture (*Gyps rueppellii*) and conservation implication in Kenya-Purity Chepkirui-MS ready for submission

B. Journal papers not complete

1. Modeling species distribution for grey- crowned-cranes in changing climate scenarios (*Balearica regulorum*) in Nairobi Metropolitan-Caroline Maina-PhD fellow

2. Seasonally dynamic species distribution of Grey Crowned Crane (*Balearica regulorum*) in Kenya

Number of Policy Briefs Developed and status:

A. policy briefs completed and published

1. Developing bird friendly transmission power lines in Kenya

<https://doi.org/10.12688/f1000research.132003.1>

B. Policy briefs still under preparation

1. Critically Endangered Rupell's vulture at risk of extinction in Kenya: Leveraging on protected areas for conservation
2. Cranes at Risk: A call for an integrated approach to save Kenya's Wetlands

Start Date - End Date: 30/11/2022 - 29/4/2023

Verification Sources: <https://doi.org/10.12688/f1000research.132003.1>

Manuscripts and manuscript IDs for submitted

Activity: Presentation of Papers at International Conference

Description: 1 BID Student was selected to attend one international conferences in 2022 to present a paper as part of the outcomes from the BID project, The BID Project Lead also presented a paper at the conference. INTECOL 2022: 28th August to 2nd September 2022

Start Date - End Date: 28/8/2023 - 2/9/2023

Verification Sources: 1. Title of Oral Paper: Distribution Modeling for Predicting the Spatial Distribution of Raptors in Kenya

Theme: Ecology in Africa: Present and Future Prospects

Presented by: Peggy Ngila, BID Fellow – PhD Student

(Presentation certificate attached).

2. Title of Oral Paper: An Integrated Approach to Enhancing Biodiversity Information Development in Africa

Theme: Ecology in Africa: Present and Future Prospects

Presented by: David Chiawo BID Project lead –supported by Strathmore University.

(Presentation certificate attached).

Report on Deliverables

Deliverables - Summary

Data mobilization: the project mobilized 11699 data records instead of 60,000. No early career researchers had the datasets. Data owners were unwilling to share biodiversity data on GBIF repository. We reported this challenge. We reached out to more data owners who were still not willing to share data. Published dataset available at <https://doi.org/10.15468/m8jxcu>

All training workshops were delivered.

Publications: the project delivered the following categories of publications described under different categories; Publishing using GBIF-mediated data is still at inception here in Kenya. 2 PhDs and 2 MSCs were involved.

Peer Reviewed Articles Development & status:

A. Journal papers completed - Publishing process in progress

1. Distribution and predictive niche modeling of five endangered raptors species; are protected areas effective for raptor conservation in Kenya?

Ngila, Peggy-PhD fellow; submitted-under peer review- (submission correspondence attached).

2. Niche distribution pattern of Rüppell's vulture (*Gyps rueppellii*) and conservation implication in Kenya-Purity Chepkirui-MS ready for submission

B. Journal papers not complete

1. Modeling species distribution for grey- crowned-cranes in changing climate scenarios (*Balearica regulorum*) in Nairobi Metropolitan-Caroline Maina-PhD fellow

2. Seasonally dynamic species distribution of Grey Crowned Crane (*Balearica regulorum*) in Kenya

Number of Policy Briefs Developed and status:

A. policy briefs completed and published

1. Developing bird friendly transmission power lines in Kenya

<https://doi.org/10.12688/f1000research.132003.1>

B. Policy briefs still under preparation

1. Critically Endangered Ruppell's vulture at risk of extinction in Kenya: Leveraging on protected areas for conservation-Delayed delivery-post project activity.

2. Cranes at Risk: A call for an integrated approach to save Kenya's Wetlands-delayed delivery-post-project activity

Theses from the BID project under preparation-ongoing and will be delayed

Peggy Ngila-PhD (Rangeland management)

Thesis title: Niche distribution and predictive modelling of risks by overhead power lines to raptors in Kenya.

University Registered-University of Nairobi, Kenya.

Significant progress to completion

Purity Chepkirui

Msc. (Animal Ecology)

Project Title: Nesting Site Selection and Breeding Success of Ruppell's Vulture (*Gyps Rueppellii*) In Hell's Gate National Park, Kenya

University Registered: Kenyatta University

Significant progress to completion

Caroline Maina

PhD (Animal Ecology)

Thesis title: Species distribution modeling and threat analysis of grey-crowned crane (*Balearicaregulus*) in the niche hotspots of Nairobi metropolitan area,

University registered Kenyatta University.

Slow progress- continuity not confirmed.

Dominic Njue Mugo

MSc. GIS and Remote Sensing

Project Title: Modeling The Spatial Distribution of the Grey Crowned Cranes in Kenya.

University Registered: Jomo Kenyatta University of Agriculture and Technology.

Slow progress-may continue post-project activity

Presentations made

1. Title of Oral Paper: Distribution Modeling for Predicting the Spatial Distribution of Raptors in Kenya.

Theme: Ecology in Africa: Present and Future Prospects

Presented by: Peggy Ngila, BID Fellow – PhD Student (Presentation certificate attached).

2. Title of Oral Paper: An Integrated Approach to Enhancing Biodiversity Information Development in Africa. Theme: Ecology in Africa: Present and Future Prospects

Presented by: David Chiawo BID Project lead –supported by Strathmore University.

(Presentation certificate attached).

New Delivery

ICCB conference Rwanda; <https://conbio.org/mini-sites/iccb-2023>. Organized symposium to present the results of the project (4 talks from the BID project)

#28 Leveraging Biodiversity Data for Conservation in Kenya

Deliverables produced by the project

Dataset deliverables

Data mobilization

Dataset type: Occurrences

Dataset scope: Data Source: Peregrine Fund (The Global Raptor Impact Network)

Number of records: 11,699

Data holder: Peregrine Fund (The Global Raptor Impact Network)

Data host institution: National Museums of Kenya

% complete: 20%

Status update: Data owners unwilling to share species data especially of endangered species.

DOI: <https://doi.org/10.>

Expected date of publication:

Other deliverables

Publications

Description: Journal papers completed

% complete: 100%

Status update: 1 submitted 1 ready for submission

Sources of verification: Submission email Copy of MS on request

Publications

Description: Not complete

% complete: 85%

Status update: 1. Modeling species distribution for grey- crowned-cranes in changing climate scenarios (Balearica regulorum) in Nairobi Metropolitan-Caroline Maina-PhD fellow 2. Seasonally dynamic species distribution of Grey Crowned Crane (Balearica regulorum) in Kenya

Sources of verification: Manuscripts

Publications

Description: Policy briefs

% complete: 90%

Status update: A. policy briefs completed and published 1. Developing bird friendly transmission power lines in Kenya B. Policy briefs still under preparation 1. Critically Endangered Rupell's vulture at risk of extinction in Kenya: Leveraging on protected areas for conservation 2. Cranes at Risk: A call for an integrated approach to save Kenya's Wetlands

Sources of verification: <https://doi.org/10.12688/f1000research.132003.1>

Publications

Description: Policy briefs note complete

% complete: 85%

Status update: 1. Critically Endangered Rupell's vulture at risk of extinction in Kenya: Leveraging on protected areas for conservation 2. Cranes at Risk: A call for an integrated approach to save Kenya's Wetlands

Sources of verification: Manuscripts

Conference presentations

Description: 1 BID Student was selected to attend one international conferences in 2022 to present a paper as part of the outcomes from the BID project, The BID Project Lead also presented a paper at the conference Project lead was supported by the university to participate

% complete: 100%

Status update: 1. Title of Oral Paper: Distribution Modeling for Predicting the Spatial Distribution of Raptors in Kenya Theme: Ecology in Africa: Present and Future Prospects Presented by: Peggy Ngila, BID

Fellow – PhD Student 2. Title of Oral Paper: An Integrated Approach to Enhancing Biodiversity Information Development in Africa Theme: Ecology in Africa: Present and Future Prospects Presented by: David Chiawo
BID Project lead –supported by Strathmore University.

Sources of verification: Presentation certificate attached

Events

ICCB Symposium

Dates: 2023-07-23 - 2023-07-27

Organizing institution: International Congress for Conservation Biology

Country: Rwanda

Number of participants: 6

Comments: We are organizing a symposium at the ICCB conference that provides us a forum to present the results of our project at different scales. Two students - Peggy Ngila and Purity Chepkirui - will present the research they developed as BID fellows. David Chiawo and Libby Ellwood will present project-wide perspectives; Laban Musunguzi will speak on BID and GBIF activities in Africa; and Mélianie Raymond will present on GBIF activities globally.

In addition to sharing our perspectives, this symposium also aims to inspire others to consider publishing data to GBIF, to use GBIF-mediated data, and to participate in BID projects as available.

Website or sources of verification: <https://conbio.org/mini-sites/iccb-2023/program/>

Communications and visibility

Internally, our communication was largely over Zoom, with asynchronous work and communication happening over email, in Google docs, and even in an active WhatsApp group. This variety allowed for continued progress during COVID, as well as participation from partners in different time zones. The Strathmore University website provided a place for us to post information about the project, including details for participants about workshops, posts about available opportunities, and ways to get in touch. Our external communication strategy includes outreach to a diversity of audiences. To reach other researchers and academics, we have submitted one article and will be submitting a second very soon, to be published in peer-reviewed journals. To reach conservation biologists, land managers, policy makers, and other practitioners, we have published one policy brief on developing bird friendly power lines in Kenya, and are preparing two additional policy briefs on the critically endangered Rupell's vulture and on saving Kenya's wetlands which will be submitted for publication soon. We are reaching additional audiences at conferences. Peggy Ngila and David Chiawo presented at the INTECOL 2022 conference, and we have organized a full symposium at the upcoming International Congress for Conservation Biology conference in Rwanda in July 2023.

In addition to their original intended audiences, all of the above, along with general project updates and activities, are also shared on ResearchGate, LinkedIn and Twitter to reach a broader audience.

Monitoring and evaluation

Final Evaluation

Project activities were overall productive and successful. Though we fell short on data mobilization and publication goals, our efforts throughout the project were consistently in a positive and active direction. Several publications are still in progress and will be completed by the end of 2023, bringing us closer to our

stated goals. We will need to continue to work on the process of mobilizing data on threatened and endangered species for our future work, and this is an important lesson learned. We will advance the ways that we can support sharing these data to instill confidence in data providers such as through obscuring locality and other sensitive aspects of the data. As our work in this continues in various iterations, we will prioritize the time it takes to build these relationships and provide the necessary technical support. The projects partners and stakeholders worked well to provide support of project participants, to promote activities, and to share products. Similarly, our interaction with the GBIF Secretariat were supportive, helpful, and understanding.

Much of the duration of this project took place during the COVID pandemic and our team and partners remained flexible and nimble to changing guidelines with travel, in-person workshops and meetings, and working virtually.

Best Practices and Lessons learned

Best practices included effective recognition of project partners, co-authorship and acknowledgements in publications, as well as co-creation of research publications and development policy briefs to inform policy makers in conservation decision making.

Lessons learned include the difficulty in mobilizing sensitive biodiversity data and the need to build in technical support for this aspect of the work.

Post Project activities

Completion and publishing of pending journal articles and policy briefs

Theses from the BID project under preparation-ongoing

Peggy Ngila-PhD (Rangeland management)

Thesis title: Niche distribution and predictive modelling of risks by overhead power lines to raptors in Kenya.

University Registered-University of Nairobi, Kenya.

Significant progress to completion

Purity Chepkirui

Msc. (Animal Ecology)

Project Title: Nesting Site Selection and Breeding Success of Ruppell's Vulture (*Gyps Rueppellii*) In Hell's Gate National Park, Kenya

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Caroline Maina

PhD (Animal Ecology)

Thesis title: Species distribution modeling and threat analysis of grey-crowned crane (*Balearicagregulus*) in the niche hotspots of Nairobi metropolitan area,

University registered Kenyatta University.

Slow progress

Dominic Njue Mugo

MSc. GIS and Remote Sensing

Project Title: Modeling The Spatial Distribution of the Grey Crowned Cranes in Kenya.

University Registered: Jomo Kenyatta University of Agriculture and Technology.

Slow progress

ICCB conference Rwanda; <https://conbio.org/mini-sites/iccb-2023>. Organized symposium to present the results of the project (4 talks from the BID project)

#28 Leveraging Biodiversity Data for Conservation in Kenya

Sustainability

Sustainability Plans

The Centre for Biodiversity Information Development (BID-C) was effectively established at Strathmore University and has been actively utilized as a space for current BID project activities as well as related activities. Strathmore University has embraced the Centre and is supportive of its work. BID-C will remain active beyond the terms of the current project. It will continue to be used as a space where BID fellows and partners can work and collaborate, where they can work to advance Kenyan bird conservation, and where publishing biodiversity data to GBIF and using GBIF-mediated data in research will remain a priority.

Likewise, the community of practice that was created spanning students to early career professionals to conservation biologists is already proving to be a long-term benefit as members of the team continue to work together and collaborate on conservation issues. The shared desire to conserve birds is evident in the continued and ongoing work that was started through BID as well as through new opportunities that are regularly shared among team members to participate in local conservation activities and actions.

The PIs and partners of this BID project are already discussing ways to leverage the Kenyan model, that was developed here, to expand it to additional countries and regions of Africa. There is potential to use this model with modifications for different regions that incorporates a focus on taxa of highest conservation concern. We plan to continue to expand our work in a way that maintains the existing community of BID participants while incorporating new members from additional African countries.

Impact of COVID-19 pandemic on project implementation

Delays in the start of workshops, however, that situation was mitigated by hybrid approach to accommodate those who were not able to attend some sessions in person.

GBIF leads the Biodiversity Information for Development (BID), a programme funded by the European Union. The programme provides supplementary support for activities addressing the needs of regional researchers and policymakers through mobilization and use of biodiversity data.

