DIGITIZATION OF GABON BIODIVERSITY COLLECTIONS AND DIGITAL OCCURRENCE RECORDS TO CREATE A NATIONAL BIODIVERSITY DATABASE

Programme:BID
Project ID: BID-AF2020-122-NAC
Project lead organization: National School of Water and Forests
Project implementation period:1/4/2021 - 31/3/2023
Report approved: 23/6/2023

Final Narrative Report

Executive Summary

Key achievements:

Our project focused on digitizing and mobilizing biodiversity data for Gabon by adding 14 new datasets to the Gabon Biodiversity Portal, which translated to more than 10,000 new occurrence records. We successfully published 5,390 records on GBIF, greatly enhancing the global understanding of Gabon's biodiversity. We conducted capacity-building workshops for 25. Gabonese researchers, hosted at ENEF in November 2021 and 2022, improving their skills in data management and digitization. Lastly, we translated a comprehensive guide to Symbiota data management, transcripts for YouTube videos, and the Symbiota user interface into French,
supporting other Francophone countries in their efforts to digitize and manage their natural history data. Google Analytics helps reveal the global reach of the Gabon Portal (attached doc: GBP_GoogleAnalytics.pdf).
Context, Approach for Final Evaluation:
For the final evaluation, we assessed the project's effectiveness in achieving its objectives, such as the increase in digitized biodiversity data, capacity building, and the development of resources for Francophone countries. Our main conclusions were that the project successfully achieved its objectives and positively impacted the understanding of Gabon's biodiversity and the capacity of local researchers.
Significant GBIF impacts (more details in attachment: gbif_impact.pdf):
Fish records: Six fish datasets added to GBIF as part of this project are in the top 15 contributors of Gabonese records. Two of these were partners in the US (Oregon State and Cornell Museum) whose Gabon fish records were not on GBIF yet. The other four Gabonese institution (including the second largest contributor on GBIF, IRAF's fish observation dataset:
https://www.gbif.org/dataset/6f1d3840-55dc-49d5-a4be-263e6299cc79). Combined, this project increased the number of fish records for Gabon by 23.14%. Extended specimens: Two datasets included 413 specimens with linked photographs.
Amphibians and Reptiles: We added four herpetofauna datasets to GBIF during this project, representing 1538 unique records and increasing the total number for Gabon by 20.78%. With 1198 media files added during the project, we increased the total number of amphibian and reptile images on GBIF by 276.67%. The Gabon Biodiversity Collection is a top 10 contributor for specimens with linked media files for all of Africa.
Key Lessons Learned and Best Practices Identified: Collaborative partnerships with local institutions (ENEF, IRAF, IRET, ANPN, USTM, SI-GBP) and international institutions (UF, NBM, ASU), were crucial for

successfully implementing the project and engaging researchers.

In-person workshops were highly effective in building capacity and fostering a sense of community among researchers.

Translating resources into French significantly improved accessibility and facilitated the adoption of digitization best practices in other Francophone countries.

Additional Objectives and Reasons for Adding Them: We added two datasets that were outside of the direct scope of this project. First, we added a reptile dataset for a collection in South Africa (https://gabonbiota.org/portal/collections/misc/collprofiles.php?collid=44). The data was relevant to the project because it was an important vertebrate collection of Gabon material, despite the institution not being in Gabon. This dataset is not published anywhere else online, and we plan to work with the curators at PEM to have these data published to GBIF. Secondly, we added a new plant dataset from USTM (https://gabonbiota.org/portal/collections/misc/collprofiles.php? collid=56). Despite not being a vertebrate collection (the focus of this project), this represents a valuable in-coutry, research and educational collection of plants.

Unexpected Challenges: We faced challenges in capacity building to the varying levels of expertise among workshop participants. This issue required additional resources and time to ensure all participants could master digitization and mobilization workflows. Greg Jongsma (the University of Florida/New Brunswick Museum) and Ed Gilbert (Arizona State University) hosted "open-office hours" every Tuesday following the first workshop. Covid-19 delayed the start of in-person workshops and subsequently, the how early we could train participants. Despite this, the project was highly successful.

Post-Project Activities: To maintain the momentum generated by the project, we plan to conduct follow-up virtual workshops, provide ongoing support to the Gabon Biodiversity Portal. Primarily we will work with institutions that have already mobilized their data to the portal to have them register their institutions to GBIF so that they can begin publishing data there (example ANPN and USTM). We will also explore funding opportunities to expand the project's scope and impact on biodiversity conservation efforts in the region. We will add all contributing institutions to The Global Registry of Scientific Collections (GRSciColl).

Progress against milestones

Has your project completed all planned activities?: Yes

Has your project produced all deliverables: Yes

Report on Activities

Summary of the implementation of the project activities

This project was highly successful and we achieved all of our stated deliverables. These include:

1. Capacity building. Over the course of two in-person workshops and weekly "office hours," Dr. Gregory Jongsma (University of Florida/New Brunswick Museum) and Dr. Edward Gilbert (Arizona State University) trained over 20 Gabonese scientists about digitization workflows, data management/cleaning, and mobilization to GBIF.

2. Digitizing and mobilizing 8 collections (representing >5,000 original occurrence records) to GBIF and 14 collections to the Gabon Portal (representing >10,000 original occurrence records).

3. Francophone resources about collection management, digitization, and mobilization were produced and made freely available online.

Report on Deliverables

Deliverables - Summary

the deliverables concerning the dataset have not all been achieved. the dataset on amphibians is reached. the dataset the recorded trap cameras are not reached. . the deliverables concerning fish were limited by the lack of supply of fish specimens to be digitized.
the deliverables concerning the camera traps are limited due on the one hand to the impassable roads which did not allow the installation of the camera traps and the covid which prohibited all activities between 2020 and 2021

Deliverables produced by the project

Dataset deliverables

Gabon Biodiversity Collection - Reptilia

Dataset type: Occurrences
Dataset scope: The collection of reptiles, actually has almost 500 specimens from across Gabon. Reptiles, as amphibian are under studied and our hope is to foster more research in the region by making visible what is already available as information. This open source collection, has also the ambition to educate on the various species occurring in Gabon.
Number of records: 483
Data holder: Elie TOBI Fournisseur de contenu Assistant Curator elietobi@gmail.com
Data host institution: : GBP Smithsonian
% complete: 100%
Status update: 10 novembre 2022
DOI: : 10.15468/2xx6uw
Expected date of publication: 2022-11-22

Gabon Biodiversity Collection Poisson (Fish)

Dataset type: Occurrences
Dataset scope: The collection of fish actually has over 400 specimen from Gabon. Fish are under studied and the actual knowledge need to be updated. Our expectation is to make recent research data available to researchers and students.
Number of records: 429
Data holder: Elie TOBI Fournisseur de contenu Assistant Curator elietobi@gmail.com
Data host institution: GBP Smithsonian
% complete: 50%
Status update: 10 novembre 2022
DOI: 10.15468/wehca5
Expected date of publication: 2022-11-10

Gabon Biodiversity Collection Amphibia

Dataset type: Occurrences
Dataset scope: jeu de données d'occurrences
Number of records: 523

Data holder: Elie TOBI Fournisseur de contenu Assistant Curator elietobi@gmail.com
Data host institution: GBP Smithsonian
% complete: 100%
Status update: 09 novembre 2022
DOI: 10.15468/fze7sg
Expected date of publication: 2022-11-09

Gabon Biodiversity Poisson Fish (ENEF)

Dataset type: Occurrences
Dataset scope: jeu de données d'occurrences
Number of records: 197
Data holder: Géovanne Aymar NZIENGUI DJIEMBI Fournisseur de contenu Curateur nzienguigiovanni@gmail.com
Data host institution: Ecole Nationale des Eaux et Forêts (ENEF)
% complete: 20%
Status update: 20 décembre 2022
DOI: 10.15468/njs5hq
Expected date of publication: 2022-12-20

Institut de Recherches Agronomiques et Forestières - Ichthyology Observations

Dataset type: Occurrences
Dataset scope: Ichthyology Observations
Number of records: 2,784
Data holder: IRAF
Data host institution: IRAF
% complete: 100%
Status update: New dataset
DOI: https://doi.org/10.15468/hayczc
Expected date of publication:

Institut de Recherches Agronomiques et Forestières - Herpetology Observations

Dataset type: Occurrences
Dataset scope: Herpetology Observations
Number of records: 619
Data holder: IRAF
Data host institution: IRAF
% complete: 100%
Status update: New dataset
DOI: https://doi.org/10.15468/rck4nu
Expected date of publication:

Institut de Recherches Agronomiques et Forestières - Ichthyology

Dataset type: Occurrences
Dataset scope: Ichthyology observation
Number of records: 314
Data holder: IRAF
Data host institution: IRAF
% complete: 100%
Status update: New dataset
DOI: https://doi.org/10.15468/7j94sm
Expected date of publication:

Gabon Biodiversity Collection - Aves

Dataset type: Occurrences
Dataset scope: Aves collections
Number of records: 109
Data holder: Gabon Biodiversity Collection
Data host institution: Gabon Biodiversity Collection
% complete: 75%
Status update: New dataset
DOI: https://doi.org/10.15468/vg84by
Expected date of publication:

Institut de Recherches Agronomiques et Forestières - Herpetology

Dataset type: Occurrences
Dataset scope: Herpetofauna of Gabon
Number of records: 40
Data holder: IRAF
Data host institution: IRAF
% complete: 50%
Status update: New dataset
DOI: https://doi.org/10.15468/fr2ahv
Expected date of publication:

Other deliverables

Events

Atelier National sur la Numérisation et la Mobilisation des Données sur la Biodiversité Au Gabon

Dates: 2021-11-21 - 2021-03-26
Organizing institution: National Water and Forest School (ENEF Gabon)
Country: Gabon
Number of participants: 20
Comments:
Website or sources of verification:

Events

Atelier National sur la Numérisation et la Mobilisation des Données sur la Biodiversité Au Gabon

Dates: 2022-11-06 - 2022-11-11
Organizing institution: National Water and Forest School (ENEF Gabon)
Country: Gabon
Number of participants: 15
Comments:
Website or sources of verification:

Events

Atelier National sur l'utilisation du logiciel MBAZA

Dates: 2022-03-29 - 2022-03-31
Organizing institution: ANPN
Country: Gabon
Number of participants: 15
Comments:
Website or sources of verification:

Events

numérisation des collections de poissons ENEF et IRAF

Dates: 2022-10-30 - 2022-11-04
Organizing institution: National Water and Forest School (ENEF Gabon)
Country: Gabon
Number of participants: 10
Comments:
Website or sources of verification:

Communications and visibility

This project produced several important resources for Francophone communities interested in digitizing and publishing their collections. These include videos and documentation, which is all freely available online.
YouTube content (French or available with french subtitles; 7 videos):
We produced six videos about data management, digitization, and GBIF publishing from the Symbiota portal.
https://www.youtube.com/playlist?list=PLkh-Tgi56p5MSwPjQqJ7JNRdq8WFczZCM (5 videos)
https://www.youtube.com/watch?v=IWMTpvwIDwI&ab_channel=GregorJongsma
This video was produced for herpetologist in Gabon that participated in the workshop:
https://www.youtube.com/watch?v=6lykwJ-AuA4&ab_channel=GregorJongsma
Translated documents:
We translated an indepth, 50-page document "Guide to Using a Symbiota-based Portal". This is freely available online and we hope will be a valuable resource for other digitization efforts in Francophone countries.
https://github.com/GJongsma/Symbiota-light/blob/master/docs/SymbiotaGuide_French_v1.1.pdf
In addition to resources for Francophone communities, we promoted the project at a scientific conference and through multiple media outlets. The Gabon Biodiversity Portal served both as our management and mobilization software, and as the public facing page for the project. Google Analytics reveal the global reach of the Gabon Portal (attached doc: GBP_GoogleAnalytics.pdf).
Conference:
TDWG conference (virtual presentation by Elie Tobi, Gabon Biodiversity Program, Smithsonian)
Video presentation about the Gabon Biodviersity Portal project: https://www.youtube.com/watch?v=1r0uQTcUQpY&ab_channel=GregorJongsma
Conference abstract:
https://www.proquest.com/openview/83f14e97a83bf5aa642acb381e93eb0c/1?pqorigsite=gscholar&cbl=2049297
Media coverage:
https://www.gabonreview.com/biodiversite-aquatique-le-gabon-veut-numeriser-ses-donnees/
https://www.gabonews.com/fr/actus/eaux-et-forets/article/enef-gabon-atelier-national-sur-lanumerisation

https://www.youtube.com/watch?v=5pTsTlfUC_M&ab_channel=gabonewsinfo
https://www.gabonmediatime.com/gabon-vers-la-numerisation-des-donnees-sur-la-biodiversite/
https://biology.ufl.edu/news/2022/the-gabon-biodiversity-portal/
We plan to publish a project summary and highlight the resources we produced in the journal
Biodiversity Informatics (https://journals.ku.edu/jbi/about) in the coming months.

Monitoring and evaluation

Final Evaluation

The goal to build capacity and digitize Gabon's vertebrate collections was a tremendous success
based on our very significant contributions to GBIF records (~25% increase in fish records for
Gabon and ~20% increase in amphibian and reptile records).
The Symbiota software played a pivotal role in mobilizing natural history data across a diverse set
of collections in Gabon. With support from this BID project we translated the user-interface for
Symbiota portals. This will increase the accessibility and discoverability of data within the Gabon
Biodiversity Portal. Importantly, it is now possible to make any Symbiota portal bilingual, for
exploration and data management. This accessibility allowed participating institutions and
individuals to shine during this project. Elie Tobi and Gauthier Massouvou (Smithsonian Gabon
Biodiversity Program) are absolute leaders in their fields. The Smithsonian Gabon Biodiversity
Program's collections in Gamba, Gabon are the flagship of the Gabon Biodiversity Program.
Almost all of the vertebrate specimens have associated images and many of the amphibian
specimens have chytrid data associated with them. This is a prime example of extended
specimen collections in Central Africa.
We would strongly encourage other BID recipients to utilize Symbiota for its shallow learning
curve, powerful cleaning tools, and easy publishing/updating datasets on GBIF.

Best Practices and Lessons learned

We developed a best-practices and standards to continue digitizing fish records at ENEF and
IRAF for years to come. This involves photographing specimens with their data labels and
catalogue tags. The photos are added to the Gabon Biodiversity Portal, and participants
transcribe the information into the database directly from the photos. Here is a video
demonstrating the approach: https://www.youtube.com/watch?
v=IWMTpvwIDwI&ab_channel=GregorJongsma. This proved to be a very efficient way to produce many
high-quality records in GBIF with associated media files.

Post Project activities

1. Registering the ANPN - Agence Nationale des Parcs Nationaux du Gabon with GBIF so that we can
mobilize their camera trap records (https://gabonbiota.org/portal/collections/misc/collprofiles.php?collid=58).
2. Publish Université des Sciences et Techniques de Masuku (USTM) records to GBIF. They recently
registered as a publisher on GBIF and have a sizable dataset already in the Gabon Portal
(https://gabonbiota.org/portal/collections/misc/collprofiles.php?collid=56)
3. Register all contributing collections to The Global Registry of Scientific Collections (GRSciColl).

Sustainability

Sustainability Plans

We developed a best-practices and standards to continue digitization and mobilization across

several institutions and collections in Gabon. All newly collected specimens will quickly be added to the Gabon Portal and then mobilized to GBIF for years to come.

The French resources (guides and videos) we produced during this project will be a tremendous resource for our continued digitization efforts in Gabon and, hopefully for other Francophone countries around the word. All of these are published online and will be freely available in perpetuity.

Now that Gabon has >20 established digitization experts, we hope we can help other Francophone countries in Africa achieve their own digitization projects successfully.

Impact of COVID-19 pandemic on project implementation

Covid-19 delayed our in-person workshops, which affected how quickly we could begin training experts in Gabon. Despite these delays, we did host several successful workshops, and because of the commitment and hard work of participants from the Smithsonian's Gabon Biodiversity Program, IRAF, ENEF, TNC, and our international workshop instructors at UF, NBM, and ASU, the project was successful.

GBIF