

# Rwanda's Biodiversity Heritage

THE CENTER OF EXCELLENCE IN BIODIVERSITY  
AND NATURAL RESOURCE MANAGEMENT (COEB)

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Welcome to our new format and monthly newsletter! We will be bringing you news about the Center each month, as well as news from our nodes and partners. As a consortium of governmental and non-governmental organizations, in a hub and spokes model, we rely on partnerships and collaborations to achieve our mission. The pandemic has taught us how to collaborate effectively across space and time. We hope you enjoy reading our news.

*Beth Kaplan*, Director of CoEB

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# Volkswagen Biodiversity Collections Summer School:

## Mind the Darwinian shortfalls: a summer school on Biodiversity and Collections Management for East Africa

This biodiversity collections summer school is funded by the Volkswagenstiftung Germany through a grant to Senckenberg, Germany in partnership with the Center of Excellence in Biodiversity and Natural Resource Management (CoEB). Field course participants will include staff from the Senckenberg Nature Research Society (German: Senckenberg Gesellschaft für Naturforschung, SGN) and CoEB, as well as postgrad students from around East Africa, and conservation NGOs and national park staff in Rwanda. The summer school will be taught by different taxonomic specialists from Africa and Germany as well as other select international research institutions.

The summer program will offer a two-week field training course and a three-day workshop each year for 3 years from 2021 to 2023. Program instructors from Germany and the East African community will work to develop modules that can be adopted as qualification courses at the Senckenberg Nature Research Society (German: Senckenberg Gesellschaft für Naturforschung, SGN) and CoEB in the fields of biodiversity and database management.

The course will introduce the core aspects of taxonomy and systematics, as well as the management of biological collections and databases (e.g., museums, university collections and herbaria) for use in biodiversity research and education. Participants will receive field training as well as training in the lab. Specimens obtained and preserved during the courses will be used to build up a reference collection at the CoEB.

This year, the 2021 field course and workshop are planned for 21<sup>st</sup> August to 5<sup>th</sup> September and the field component will take place in Nyungwe National Park (NNP) in collaboration with park management.

**SENCKENBERG**  
world of biodiversity

# Strategic Planning Course for the National Herbarium of Rwanda

Spring 2021



Included with a select number of herbaria worldwide, the National Herbarium of Rwanda (NHR) was invited to participate in a strategic planning course that took place from 23<sup>rd</sup> March to 11<sup>th</sup> May, 2021, following a successful application by the NHR. This yearly course is organized by Integrated Digitized Biocollections (iDigBio).

More than 30 participants from Herbaria, Museums, Arboretum, and Universities with botanical collections took part in this 8-week online course.

The course instructors included Austin Mast (Florida State University (FSU), iDigBio Co-Principal Investigator), Robert K. Godfrey (FSU Herbarium Director) and David Jennings (University of Florida, iDigBio Project Manager, GBIF Nodes Regional Representative North America).

During each weekly, 1-hour class, the participants were led through a discussion of the previous week's completed homework assignments on strategic planning, a presentation of new content, and a question-and-answer session. The course aimed to build momentum in the strategic planning process and get students to interact and learn from each other both in and outside of class.

Under the guidance of the course and enthusiasm invoked by the process, the NHR participants worked to introduce new purpose and excitement to the herbaria and its plans for the future, which include preparing to relate the collection's compelling vision to stakeholders and discuss long-term goals and strategies with administrators.

As part of the final outcome of the course, NHR successfully produced a draft strategic plan that included the herbaria's vision, mission, stakeholders, strategies, objectives, goals, action evaluative steps, and sustainability.



# Promoting Research and Building Capacity:

## Forming Research Groups within CoEB



CoEB Research Associates and Fellows are eligible for an abundance of research grants every year based on the Center's mission and goals, but unfortunately, it is often the case that deadlines pass without any proposal submitted from CoEB. In order to address this issue and work towards filling research gaps, the CoEB hosted a meeting on 25 May 2021 with its staff, research associates, and research fellows to brainstorm a way forward. Chaired by CoEB Director and Deputy Director, Prof. Beth Kaplin and Dr. Venuste Nsengimana, the meeting began with a presentation about

disseminating research findings by Dr. Venuste Nsengimana.

The presentation discussed the use of soil-litter arthropods as biological indicators of soil quality in southern Rwanda, a project funded by Royal Belgian Institute of Natural Science (RBINS). Research on soil-litter arthropods in different land uses provides information about the use of soil-litter arthropods as biological indicators of soil quality according to Dr. Venuste. There are now three published papers available that discuss this topic. This was used as an example of what is possible with a small grant and some high motivation.

Some of the CoEB research groups are already functional and there were new suggestions making 13 total research groups. You can find the details about the groups and ways to collaborate here <https://docs.google.com/forms/d/1xneUFiAnQofBagnttAhP-gMOFmA2z3sheWuJ7-XLCpl/edit>. We welcome nodes and partners to collaborate with us on research grant proposals and projects.

To make the groups productive, the meeting comes up with an accountability structure for each research group including # of meetings, # proposals submitted, # successful proposals, # active projects and # research outputs. Outputs may include publications, conference presentations, policy briefs, community outreach, radio or TV talks, trainings and so on.

Dr. Aisha Nyiramana, CoEB Research Associate and other meeting participants agreed to organize panel discussions on current issues like volcanic eruptions and Covid 19 and to discuss their impacts on biodiversity and humans. This panel will bring together a multidisciplinary group of academic, government, and NGO staff members to look for solutions to current issues and discuss steps moving forward.

# Learning to use iNaturalist:

## Discover a world of biodiversity at your doorstep

Organized by a former UR BSc student and the CoEB, with funding from the National Geographic Society (NGS), training on the use of iNaturalist took place on 17-18 May at Huye campus. The training included a one day in-class session on understanding iNaturalist and one day field class session to collect data in the form of pictures and metadata on the location and organism for all species observed (e.g. plants, birds, insects, amphibians, reptiles). More than 20 people participated in the training and included Bachelor's students and staff from Forestry, Agroforestry (CAVM), and Conservation Biology (CST), as well as CoEB staff.

CoEB chose to host the event at UR because the students, teachers, and researchers are then able to acquire skills and pass on skills to other individuals within the University community over space and time. Furthermore, the CoEB is involved in a number of projects to map biodiversity data for Rwanda, including the Rwanda Biodiversity Information System (<https://rbis.ur.ac.rw/>).

Prof. Beth Kaplin, the Director of CoEB, explained that Huye campus and the Arboretum of Ruhande forest are excellent places for UR students to practice what they learn in the classroom. She also supports and encourages the use of iNaturalist and remarked that it is a good platform for lecturers and students to learn more about taxonomy and data analyses. "We are going to build our capacity to use iNaturalist and connect it to our work with biodiversity data, and use these great outdoor labs available to us" said Prof. Beth Kaplin.

iNaturalist is a global, online platform that allows users to collect and directly upload species data, easily making data available online for scientists and enthusiasts. As a social networking space, it allows individuals to easily share biodiversity information with each other. This platform provides scientists with a multitude of data that can be used to address a variety of topics like species occurrence, distribution, and habitat preferences. iNaturalist platform also helps create a foundation for future citizen science activities in Rwanda. By linking observers with taxon experts, iNaturalist has even facilitated the identification of new species. Moreover, this powerful tool can be integrated into classroom teaching in biology, ecology, taxonomy, and data manipulation courses to help students get practical experience.



Providence Akayezu, a National Geographic Explorer and Faculty at the African Leadership University (ALU), and graduate of the conservation biology BSc program at Univ of Rwanda, developed the concept for this training. She participated in the event as a trainer, discussing the functionality of iNaturalist. Participants learned about iNaturalist and citizen science, the importance of connecting humans to nature, and conducted a half day BioBlitz in the Arboretum of Ruhande.

“BioBlitz is project created on iNaturalist for having a snapshot of biodiversity of a particular area in a particular time period” said Chloé Cipolletta, Program Director of National Geographic Society, East Africa Fund.

The Deputy Director of CoEB Dr. Venuste Nsengima, an expert on ants, and CoEB Research Associate Mapendo Mindje also participated in the event and agreed that it is always a good idea to involve UR staff in these kinds of events in order to help build student capacity and strengthen collaborations.

iNaturalist is a joint initiative of the California Academy of Sciences and the National Geographic Society, and its headquarters is located in San Francisco, USA. The iNaturalist network is still growing and many countries are eager to become members. As of September 20, 2020, iNaturalist had more than 50 million records of biodiversity data (e.g., photos, vocalizations). Learn more about this app on their website, and register to join the network:

<https://www.inaturalist.org/pages/about>



# CoEB Seminar Series Reaches New Heights



In an effort to continue to engage students, researchers, and professionals from around the world, the CoEB seminar series hosted a diversity of topics during May 2021. Three seminars were provided, including a presentation given by Dr. Melanie DeVore, a *Professor of Biological and Environmental Sciences at Georgia College, USA*. She presented her research in Conservation Paleobotany titled 'Recruiting the Dead to Serve the Living'. Another presentation was done by Dr. Laure Rurangwa, a *Conservation scientist From Wildlife trust Rwanda*. She presented on 'Assessing tropical forest restoration after fire using birds as indicators: An afrotropical case study'. Last but certainly not least, was Dr. Carlos Velazco, a *Project Manager, Citizen Science from National Geographic Society, Mexico*, who's presentation was titled 'Learn about iNaturalist and citizen science and its role in making biodiversity data accessible'.

Video recordings of the CoEB Seminar Series can be accessed here:

<https://www.youtube.com/channel/UCdr8ykoxB00DI7ywxpvBuWA>



# International Day of Biological Diversity:

We are part of the solution!



International Day for Biological Diversity 2021 brought us another topic to think about. In 2020-2021, human-wildlife conflicts in Huye District increased around the Ruhande Arboretum where vervet monkeys are located. There were an increased number of complaints from people who live near the forest that the vervet monkeys were raiding their crops, and unfortunately, often the solution is to kill the animal.

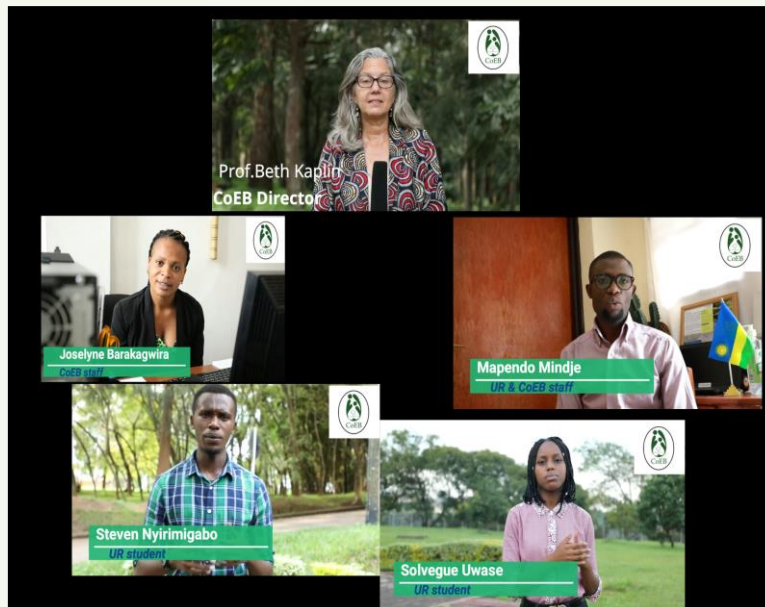
As the entire world celebrated the International day of Biological Diversity, the CoEB sponsored a community outreach event where members of

the CoEB team joined together with community members from Mukoni village and Cyarwa Cell (Tumba sector) to clear garbage from the roads and collect plastics there. The CoEB team also took the opportunity to discuss with the local community different conservation issues, including acknowledging the value of pollinators, frogs, millipedes, and earthworms to the well-being of humans, which calls us to protect these organisms at the governmental, community, and personal level. The team discussed plastics and the harm they can cause to the environment (e.g, soil and water health) as well as how their impact can be reduced.

Finally, as a major driver of the outreach campaign, the team discussed the issue of human-monkey conflict. Members of the team discussed ways in which people and animals can live more harmoniously together by changing behaviors and attitudes. "There are many ways you can prevent monkeys from damaging your crops without killing them including noise or dogs chasing...They are not really a threat to you, we need them to survive and they need us too... it is our role to protect them from killings as a last resort it is not a solution" said Mapendo Mindje.

Biodiversity provides numerous ecosystem services and resources essential to Rwanda's economic development, especially as the country relies primarily on natural resources for its development and the welfare of its citizens. In a statement made by Anathalie Ingabire, CoEB professional intern, she stated that "as the one who knows much on finance, our country needs money from its natural resources. Here we know that tourism brings much money from tourists who come and pay for our animals, plants, lakes etc., so when you protect monkeys, you will be protecting our economy too. And the economy of our country will bring you electric power, roads, hospitals, schools etc." CoEB Deputy Director Dr. Venuste Nsengimana also spoke, acknowledging that "we don't have a permanent solution but what I can promise you is advocacy and I hope this will end up with good answer for you! I beg you all to keep your anger to monkeys located here." The community agreed to adopt other mitigation measures to lead monkeys away from crop-raiding while sustainable solutions to protect both monkeys and people's crops are being identified.



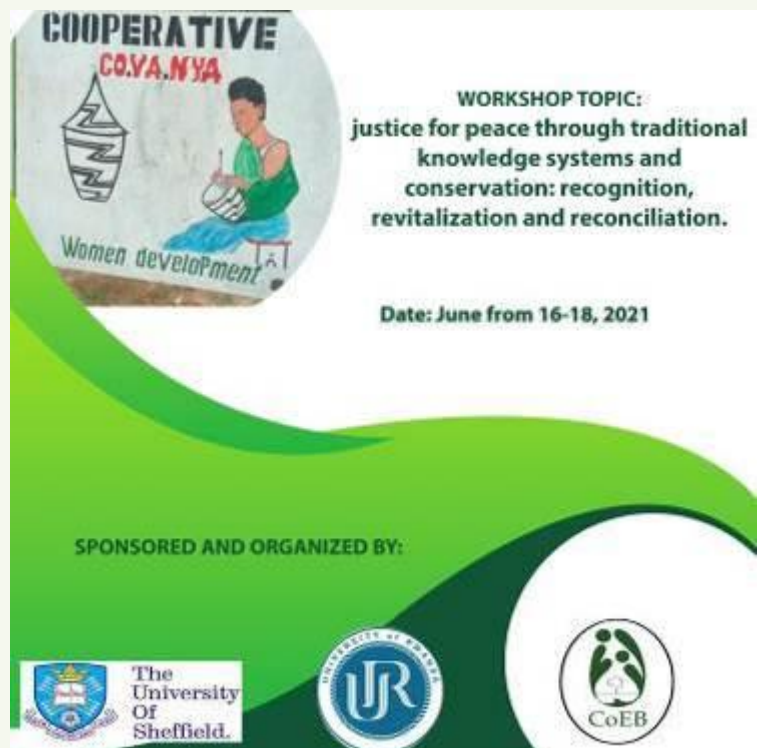


In honor of World Biological Diversity Day, the CoEB communications team also created a celebration video that compiled recorded video messages from the director of CoEB, Prof. Beth Kaplin, CoEB Research Associates, staff and University of Rwanda students.

See the video at:

[https://www.youtube.com/watch?v=Ut\\_UhMNtcYE&t=18s](https://www.youtube.com/watch?v=Ut_UhMNtcYE&t=18s)

## Upcoming CoEB Event



## Post-graduate Highlights: Leonce Ngirinshuti

### Studying caddisflies as bioindicators of water quality in freshwater ecosystems



**Meet Leonce Ngirinshuti**, a MSc student in Biodiversity Conservation and Natural Resource Management. His research interest is focused on freshwater biodiversity, especially their taxonomy and ecological significance for the sustainability of freshwater resources. His master's research investigated caddisflies, aquatic insects in the order Trichoptera, in Nyungwe National Park. During his work he and his team were fortunate to discover a new species that they named *Silvatares laetae*. Currently, he is conducting macroinvertebrate study of the littoral zone of Lake Kivu.

#### **Tell us briefly what you think about biodiversity conservation in Rwanda?**

There has been a great conservation effort in Rwanda in recent years. Importantly, government agencies, local and international organizations, as well as academicians and researchers, have been on the frontline to raise public awareness about nature and its threats. This has had a very positive impact that has helped limit the degradation of natural ecosystems, restore degraded habitats, and save threatened biodiversity. However, the majority of research and conservation efforts have primarily been allocated to terrestrial biodiversity. Thus, there is need to extend conservation efforts towards aquatic ecosystems.

#### **How do you see the state of fresh water ecosystems conservation and what do you think are the major threats that they are facing?**

Generally, knowledge about freshwater biodiversity in Rwanda is lacking and a conservation framework has not clearly been established. The major threats to freshwater biodiversity are associated with different land use practices, land cover changes, agricultural activities, and industry and urban development. This has resulted in increased runoff and pollution, as well as changes to flow regimes in lentic waters. Additional threats include overexploitation, biotic shifts, and environmental hazards related to climate change.

#### **What do you think about the conservation of macroinvertebrates in Rwanda? What may be their unique biological importance? What are the threats that the species face in Rwanda?**

Knowledge about the diversity and distribution of macroinvertebrates in Rwanda is also lacking, making it difficult to speculate about their conservation status. Many groups of benthic macro-fauna can serve as important indicators of water quality and the overall health of aquatic ecosystems. Major threats to these organisms often include habitat loss and degradation from contaminated runoffs and industrial and urban waste.

The Government of Rwanda is committed to Centers of Excellence that will ensure research is available to meet national data needs for evidence-based decision making. University of Rwanda hosts several Centers which drive academic research and innovation in support of policy and management. The CoEB was formally established at University of Rwanda in 2016 and works across Colleges, Schools and departments. It engages with environmental scientists, biologists, social scientists, policy scientists, gender experts, ecological economists, anthropologists, chemists, pharmacists, molecular biologists, foresters, agronomists, climate scientists, and many others. We work with youth and seniors, with government and private sector, communities, NGOs and international partners to meet our mission.

We are developing opportunities for youth and junior staff to gain experience, we provide data for decision-makers, we are creating an academic/research culture, and making it pleasurable. We are creating a dynamic and welcoming atmosphere for academics and practitioners, we want science and research to be enjoyable and rewarding, and we are driven to contribute to sustainable development goals and achieving climate resiliency.

## Contact us!



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