



Using Environmental DNA to Guide the Re-wilding of Akagera National Park

Professional Development Workshop

June 16-25, 2022

An essential key to conserving biodiversity is understanding the current and historic composition of biotic communities. Environmental DNA (eDNA) is a cutting-edge tool for doing just that. It takes advantage of the fact that animals and plants shed their DNA and that DNA can reside in the sediments for 100's to 1000's of years. This DNA can be captured and sequenced to allow us to build a picture of both past and current environments.

The Center of Excellence in Biodiversity and Natural Resources Management, University of Rwanda (UR) in partnership with researchers from the Congo Basin Institute at University of California, Los Angeles and CaleDNA at University of California, Santa Cruz are hosting a training workshop that shall take place at Akagera National Park and at the College of Science and Technology, UR. The workshop is funded by the National Geographic Society.

Participants

Participants are from University of Rwanda, Nangui Abrogoua University, Cote Ivoire, University of Parakou, BENIN and other institutions and organizations in Rwanda (Rwanda Forensics Lab, Dian Fossey Gorilla Fund, UR/Albertine Rift Conservation Society, Akagera NP, Gorilla Doctors). There are 15 participants in total, and 6 organizers and trainers from UR, UCLA, UC Santa Cruz and Akagera National Park.

Objectives of the workshop

- We will equip participants in this workshop with hands-on experience with the many uses of eDNA.
- We aim to understand biodiversity patterns in the park over the last 500 years and help park management plan for reintroductions. Akagera National Park will be our test case for using these tools to inform re-wilding efforts. The park currently harbors an unusually small number of mammal species. We don't know if 'missing' species existed in the region in the past but were lost due to human activities, or whether they are naturally absent. We aim to understand biodiversity patterns in the park over the last 500 years and help park management plan for reintroductions.
- Participants will learn about eDNA and its many uses, how to collect eDNA samples from lake sediments, how to process those samples, and analyze the resulting data.
- Participants will have the opportunity to work with the data from Akagera as it becomes available and to become authors on publications resulting from the workshop.



Participation

Participants have been selected through an application process completed in April 2022 and will participate in the workshop free of charge. Lunches will be provided during each day of the workshop. Travel between UR and Akagera, and camping fees and meals in Akagera, are also provided free of charge. Tents and sleeping pads will be provided but participants will need to bring their own sleeping bags, pillows or other bedding. Participants are expected to arrange and cover their own travel expenses to Kigali and their room and board while in Kigali.

Important note regarding COVID protocols: Participants are expected to show a negative COVID rapid test result from a test taken within 48 hours prior to the start of the workshop. Additional information will be provided on Akagera National Park requirements during the workshop.

Workshop Schedule – 16-25 June 2022

16 June, Day 1 Introduction to the science of eDNA. College of Science & Technology (CST), Conference room on top floor of Einstein block (ICTP), Nyarugenge campus, University of Rwanda.

17-18 June, Days 2-3 Participants will work with existing data from our previous projects to learn how to analyze eDNA sequence data and assess species presence and abundance over time. CST, Karisimbi block (former KIST 4), Nyarugenge campus, University of Rwanda

19-22 June, Days 4-7 Hands on experience with eDNA sampling in Akagera National Park. We will collect sediment cores and sample surface sediments. In and around three of Akagera's lakes. We will also collect metadata on natural history observations.

23-25 June, Days 8-10 Hands on experience in the lab, extracting eDNA and producing libraries for sequencing. CST, Karisimbi block (former KIST 4), Nyarugenge campus, University of Rwanda