



# Gorilla Doctors Michael Cranfield Regional One Health Laboratory

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Lab Dedication  
January 31, 2024



The construction and equipping of the Gorilla Doctors Michael Cranfield Regional One Health Laboratory was made possible with the generous support of:

## | Anonymous

| Columbus Zoo & Aquarium

| Jeffrey & Tiffany Neu

| International Gorilla Conservation Program

| Partners In Conservation at the Columbus Zoo & Aquarium

## Gifts In-Kind

Bioteck Solutions Group, LLC

Linda Cherapow

Dolbey Jamison

Tammy Frazer

Kathleen and Ed Gabrielson

Global Histology Consulting, LLC

Houston Zoo, Inc.

Dr. Linda Lowenstine

Maryland Zoo Hospital

Newcomer Supply, Inc.


Rakin Biomedical Corp

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Sanofi

Swift Path Solutions, Ltd.

Tanji Consultants



Lab preparations for the event would not have been possible without the exceptional efforts of:

**Skyler Bishop**, Volunteer Photographer + Advisory Council Member

At his own expense, Skyler traveled to Rwanda to photograph our events and join our field veterinarians in the forest to help build our collection of gorilla images. Several of the photos in this portfolio are thanks to him.

**Alex Tremeau-Bravard, PhD**, Laboratory Specialist

Under the direction of Dr. Tierra, Dr. Alex was in Musanze two weeks before the event helping to set-up equipment and provide training to laboratory staff. He also graciously provided many wall, door, and window measurements for Amy.

**Eunah Preston**, Marketing & Graphic Design Specialist

Under the direction of Amy, Eunah designed the educational posters found throughout the lab.

**Team Rwanda**

The entire team in Rwanda worked day and night leading up to the event.

**GORILLA DOCTORS.**

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# GORILLA DOCTORS

Regional Headquarters

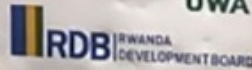
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UC DAVIS

VETERINARY MEDICINE  
Karen C. Drayer Wildlife Health Center

Welcome to Gorilla Doctors Regional HQ!



OFFICES

LABORATORY

PARKING

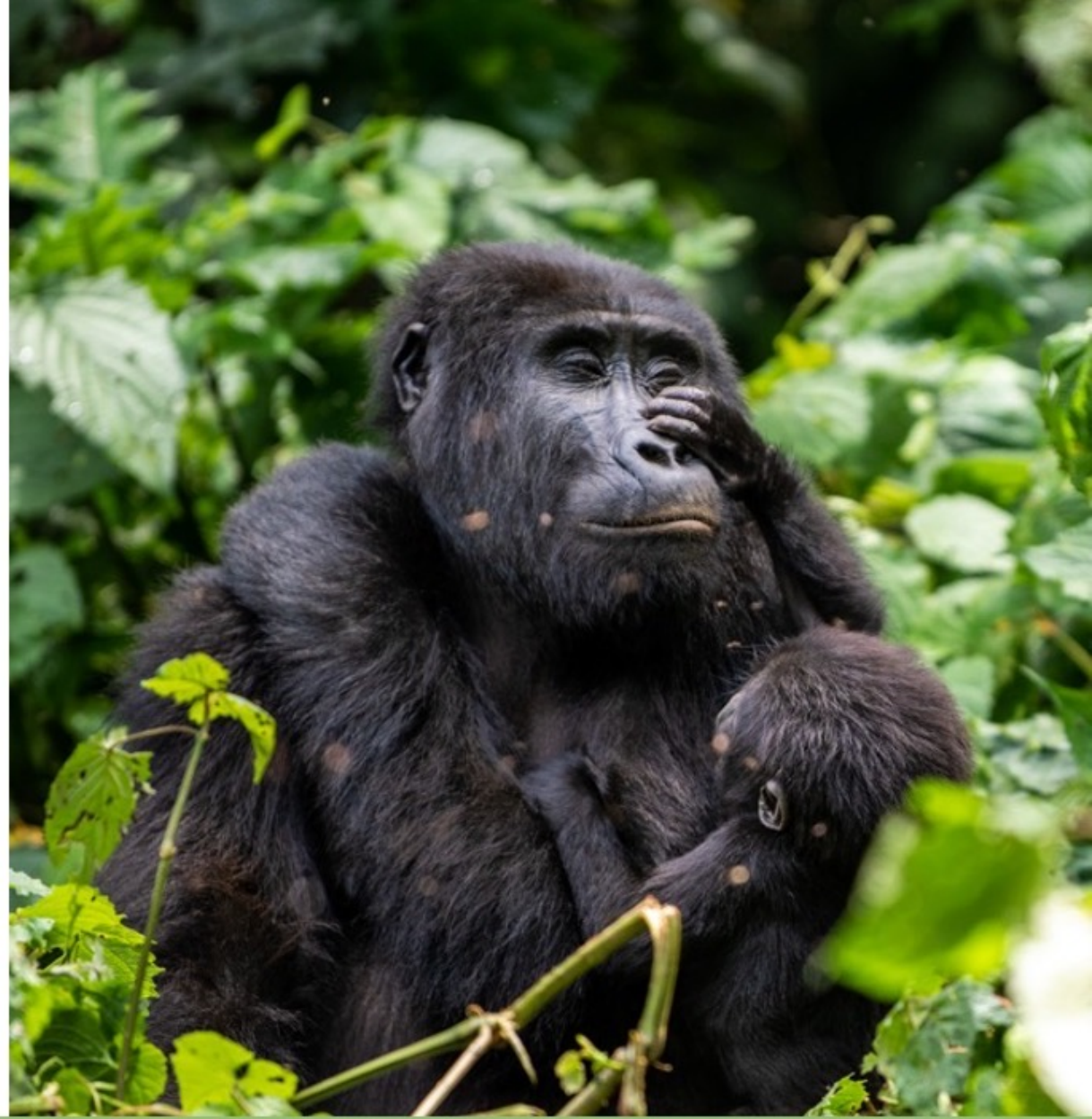
Newly planted garden for our dear friend

THE  
PETER  
RIGER  
Memorial  
Garden



Ferocious guard dogs: Fox and Clyde

# The Lab BEFORE



**GORILLA DOCTORS.**





Pharmacy + Histopathology Entrance



Laboratory Main Entrance



Main Entrance Hallway



Main Entrance – Preparing to Hang Sign

Clearing out the Reception Area





Interior Hallway – A Blank Canvas



 **Bacteriology  
& Serology**

Dr.Tierra Hangs the First Sign!



Getting everything ready to shine!





# The Lab AFTER

**GORILLA DOCTORS.**

Gorilla Doctors  
Michael Cranfield Regional One Health Laboratory



Laboratory Main Entrance



**GORILLA DOCTORS.**



  
Gorilla Doctors  
Michael Cranfield  
Regional One Health  
Laboratory

This sign has internal LED lights – sometimes great science happens after dark



Gorilla Doctors  
Michael Cranfield  
Regional One Health  
Laboratory



Dr. Noel looking way too cool

 **Biobank**

  **KIPRED + SPRINGFIELD**  
The Biobank is a collection of biological samples and associated data, which are stored and managed in a secure and controlled environment. The Biobank is used for research and clinical purposes. The Biobank is managed by KIPRED and Springfield.



## Gorilla Doctors Michael Cranfield Regional One Health Laboratory

We honor the life and legacy of Dr. Mike Cranfield, Gorilla Doctors' executive director from 1998 to 2019, who we lost too soon on August 28, 2023. So much of Gorilla Doctors' contribution to the recovery of mountain gorillas and the expansion of our mission to include critically endangered Grauer's gorillas, and the people who protect them, is the result of Dr. Mike's tenacity and dedication.

In 2009, Cranfield forged a partnership between the Mountain Gorilla Veterinary Project and the Karen C. Drayer Wildlife Health Center at the University of California, Davis School of Veterinary Medicine – Gorilla Doctors was established, launching a new era of cutting-edge scientific research.

This world-class diagnostics laboratory represents the culmination of Dr. Mike's vision for the critical importance of scientific research as a foundation for achieving wildlife health and advancing conservation medicine for great apes.



Just inside the main entrance

Reception area cleared out with some of the featured signage



Dr. Eddy greeting guests in the lab reception area  
 Photo courtesy of Judy Stampler

## SOLVING HEALTH MYSTERIES: From Forest to Laboratory to Saving a Species

**Step 1: Our Patients are Wild**  
 During a health check in the forest, Gorilla Doctors' field veterinarians conduct visual assessments of each individual gorilla, recording data on their breathing, feeding, movement, order and consistency of feces, and body condition.

**Step 2: Clinical Signs as Clues**  
 An individual gorilla's abnormal clinical signs help our field veterinarians determine the type of illness that may be affecting the gorilla.

<b>Abnormal Site Signs</b> Coughing, Sneezing, Swelling, Reddening/Itching	<b>Respiratory Clinical Signs</b> Coughing, Wheezing, Stridor, Rapid Breathing	<b>Systemic Clinical Signs</b> Fever, Anorexia, Weight Loss, Behavioral Changes	<b>Substrate/Behavioral Signs</b> Altered Feeding, Abnormal Feces, Abnormal Behavior
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**Step 3: Gathering Evidence**  
 The field veterinarians know from experience that the physical manifestation of disease does not always reveal the underlying cause, so collecting specimens for analysis in the laboratory is critical.

- **SPECIMENS FROM THE ENVIRONMENT:** Feces, hair, and saliva from chewed plants
- **SPECIMENS FROM A GORILLA:** Blood, swabs, and tissue (collected when a gorilla is anesthetized)

**Step 4: Unraveling the Mystery**  
 Back at the Gorilla Doctors' Michael Cranford One Health Regional Laboratory, the lab team processes specimens for analysis, running diagnostic tests to determine what might be causing the gorilla's illness.

**Gastrointestinal Clinical Signs**

- Molecular Diagnostics
- Parasitology Diagnostics
- Bacteriology Diagnostics

**Respiratory Clinical Signs**

- Molecular Diagnostics
- Microbiology
- Immunology

**Abnormal Site Signs**

- Microbiology
- Parasitology Diagnostics
- Immunology

**Step 5: Connecting the Dots**  
 Results from all the laboratory tests, analyzed in combination, can reveal the underlying cause of illness. Sometimes the results raise additional questions and further tests are required. Equally important is the ability to rule out certain diagnoses.

**Step 6: Our Hospital is the Forest**  
 Ultimately, the goal of diagnostic testing is for Gorilla Doctors' veterinarians to return to the forest to provide targeted and specific treatment of the gorilla to improve its health and ensure its survival.

**Step 7: Saving a Species, One Gorilla at a Time**  
 Every time Gorilla Doctors saves an individual gorilla, the health data and specimens are archived for future scientific research. Understanding individual cases helps advance the health of the entire population. For a long-lived, slow to reproduce animal, every individual counts towards saving the entire species.



**Gorilla Health**  
A gorilla's health is a complex matter, involving a range of factors from genetics to environment. This section explores the challenges of keeping these magnificent animals healthy in captivity.

**What's So Special?**  
Gorillas are the largest of the great apes, and their size and strength make them a fascinating subject for study. This section discusses the unique characteristics of these animals.

**Why are they important?**  
Gorillas play a vital role in their ecosystems, and their conservation is crucial for maintaining biodiversity. This section highlights the importance of these animals.

**How do we get that Special Gorilla Health?**  
This section details the various methods used to monitor and maintain the health of gorillas, from regular check-ups to specialized treatments.

**Learning Gorilla Health Matters**

**One Health from Field to Laboratory**  
This section explores the integration of field research and laboratory studies to better understand gorilla health and disease. It highlights the collaborative efforts of scientists and conservationists.



**One GORILLA at a time**

**ONE DISEASE AT A TIME**

**ONE HEALTH FROM FIELD TO LABORATORY**

**ONE GORILLA AT A TIME**

**Conservation**  
This section discusses the various strategies used to protect gorilla populations in the wild, including habitat preservation and anti-poaching efforts.

**Research**  
This section highlights the ongoing scientific research into gorilla biology, behavior, and health, and how this knowledge is being applied to conservation.

**Education**  
This section focuses on the importance of educating the public about gorillas and the threats they face, and how this can lead to more effective conservation efforts.







**Photo Gallery**

1. A gorilla sitting in a bamboo forest, eating a piece of bamboo.

2. A gorilla sitting with a baby gorilla.

3. A close-up of a gorilla's face.

4. A close-up of a gorilla's hands holding a piece of bamboo.

5. A gorilla sitting in a bamboo forest, eating a piece of bamboo.

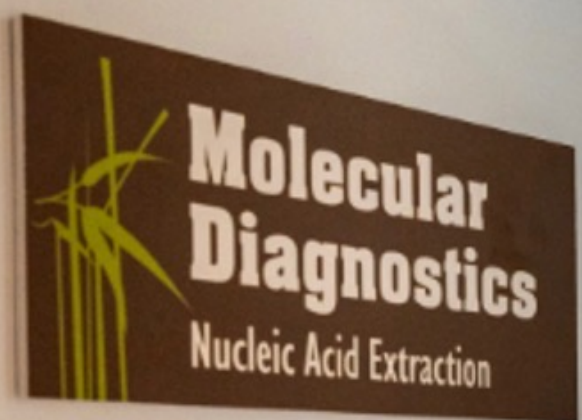
6. A landscape view of a mountain range with clouds.







Interns Concorde and Patience helping to get the lab ready



 **Bacteriology  
& Serology**



LEXOVA SA  
MASTERGUARD  
LATEX DISPOSABLE GLOVES  
MASTERGUARD  
LATEX DISPOSABLE GLOVES  
MASTERGUARD  
LATEX DISPOSABLE GLOVES

**What is a parasite?**  
 A parasite is an organism that lives on or inside another organism (the host) and benefits at the host's expense. Parasites can be unicellular organisms like bacteria and protozoa, or multicellular organisms like helminths and arthropods.

**How do parasites spread?**  
 Parasites spread through various means, including direct contact, contact with contaminated surfaces, and consumption of contaminated food or water. Some parasites also use intermediate hosts to complete their life cycle.

**What are the symptoms?**  
 Symptoms of parasitic infections vary widely depending on the type of parasite and the location of the infection. Common symptoms include abdominal pain, diarrhea, nausea, and weight loss.

### Gastrointestinal Parasites in Mountain Gorillas

Mountain gorillas of Eastern Africa harbor various parasites in their gastrointestinal tract, which can affect their health and survival.



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**Parasites in Gorillas**  
 Mountain gorillas harbor various parasites in their gastrointestinal tract, which can affect their health and survival.

**Identifying Parasitic Infections**  
 Identifying parasitic infections in gorillas involves examining fecal samples under a microscope. Key features to look for include the shape and size of eggs and larvae.


**Parasites Due to Life-Stratifying**  
 Parasites in gorillas are often acquired through contact with contaminated food or water, or through direct contact with other gorillas.

**Reducing Parasitism: Keeping Gorillas Healthy**  
 To reduce parasitism, gorillas should be kept in clean, hygienic environments. Regular veterinary check-ups and deworming treatments can also help maintain their health.

**Complete Parasitic Fauna Body System**

Parasite Name	Site of Infection	Host
Ascaris lumbricoides	Small intestine	Human
Trichostrongylus axei	Stomach	Cattle
Haemonchus contortus	Small intestine	Cattle
Ostertagia circumcincta	Small intestine	Cattle
Trichostrongylus colubriformis	Small intestine	Cattle
Trichostrongylus colubriformis	Small intestine	Sheep
Trichostrongylus axei	Stomach	Sheep
Haemonchus contortus	Small intestine	Sheep
Ostertagia circumcincta	Small intestine	Sheep
Trichostrongylus colubriformis	Small intestine	Sheep
Trichostrongylus axei	Stomach	Sheep
Haemonchus contortus	Small intestine	Goat
Ostertagia circumcincta	Small intestine	Goat
Trichostrongylus colubriformis	Small intestine	Goat
Trichostrongylus axei	Stomach	Goat
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Trichostrongylus colubriformis	Small intestine	Goat
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Haemonchus contortus	Small intestine	Goat
Ostertagia circumcincta	Small intestine	Goat
Trichostrongylus colubriformis	Small intestine	Goat
Trichostrongylus axei	Stomach	Goat





# Histopathology

## What is Histopathology?

Histopathology is the study of changes in tissues associated with a disease or disorder. Performed using a microscope, histopathology can help determine the cause of death of a gorilla, but also causes of conditions in live gorillas through the collection of tissue biopsies.

## Why Collect Tissue Samples?

When a gorilla dies in the forest, a tremendous amount of knowledge about the individual's life, physiology, health status and conditions leading to its death can be obtained through both a gross morphological examination of the carcass as well as through the microscopic analysis of tissue samples collected from the carcass.

Gorilla Doctors conducts full post-mortem examinations on all gorilla carcasses recovered from the forest. As part of this examination, samples from all organs are collected and the tissue specimens are processed and attached onto glass slides.

To visualize different components of the tissue under a microscope, the sections are dyed with one or more stains. The aim of staining is to reveal different cellular components. Slides are evaluated by diagnostic pathologists trained to recognize and compare normal versus diseased cells and tissue structures.

In cases where a living gorilla is exhibiting a visible abnormality, histopathology helps Gorilla Doctors to diagnose and treat the underlying cause. For example, examination of skin biopsies helped us diagnose warts (see image to right), an ectoparasitic disease, and then provide appropriate treatment with antiparasitic drugs.



*Gorilla Doctors maintains the largest database of histopathology of any free-living great ape species in the world.*

## Understanding Disease in Gorillas - One Histopath Slide at a Time

With this rich database, population-level analysis are performed to understand larger trends in health and disease. Gorilla Doctors, our collaborators and other scientists studying gorillas as well as human health, are actively researching:



- Pathogenesis of chronic and acute diseases in gorillas
- Comparative pathology with other great apes
- Population trends in causes of death
- Natural processes of aging





# LAB DEDICATION

**GORILLA DOCTORS.**





Dr. Fred greets board member Ben Jones – Ben arrived in the nick of time after multiple cancelled flights, lost luggage and being awake for nearly 40 hours! Without skipping a beat, he walked up to the podium and greeted the crowd with enthusiasm!



Dr. Kirsten welcomes nearly 50 guests



Gorilla Doctors  
Michael Cranfield  
Regional One Health  
Laboratory

The guided lab tours begin


**Why Study Parasitology?**

Parasitology is the study of organisms that live on or inside other organisms and cause disease. It is a branch of biology that focuses on the interactions between the parasite and its host, and how these interactions affect the health of the host.

**Skills & Careers**

Parasitologists study the life cycles of parasites, how they spread, and how they interact with their hosts. They work in a variety of settings, including research laboratories, public health agencies, and clinical settings. Some common careers for parasitologists include:

- Research Scientist
- Public Health Specialist
- Clinical Microbiologist
- Diagnostic Laboratory Technician
- Environmental Health Specialist



Parasitology is a fascinating field that offers a unique perspective on the world of life. It is a discipline that is constantly evolving, and it offers a wide range of opportunities for those who are interested in the study of life and disease.

**What is Biology?**

Biology is the study of life and living organisms. It is a branch of science that focuses on the characteristics, functions, and interactions of living organisms.

**Why Study Biology?**

Biology is a fascinating field that offers a unique perspective on the world of life. It is a discipline that is constantly evolving, and it offers a wide range of opportunities for those who are interested in the study of life and disease.

**How do we get that awesome bug & disease?**

Parasitology is the study of organisms that live on or inside other organisms and cause disease. It is a branch of biology that focuses on the interactions between the parasite and its host, and how these interactions affect the health of the host.

**Public Health & Disease**

Public health is the study of the health of a community. It is a branch of medicine that focuses on the prevention and control of disease, and the promotion of health.

**Relating Family Health History**

Family health history is the study of the health of a family over time. It is a branch of medicine that focuses on the identification and management of genetic and environmental factors that contribute to disease.

**One Health from Field to Laboratory**

One Health is an approach to health that recognizes the interconnectedness of human, animal, and environmental health. It is a multidisciplinary approach that involves the collaboration of scientists from different disciplines to address complex health challenges.

The One Health approach is essential for addressing the global health challenges of the 21st century. It is a paradigm shift that is necessary to ensure the health and well-being of all people and the planet.



**Parasitology**

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**Family Health History**

Family health history is the study of the health of a family over time. It is a branch of medicine that focuses on the identification and management of genetic and environmental factors that contribute to disease.



UNIVERSITY OF THE  
SOUTH COAST

UNIVERSITY OF THE  
SOUTH COAST



Patience and Concorde in their formal dresses – rented just for the lab dedication event!





Drs. JC (front) and Methode work diligently in the Pharmacy with interns Concorde and Patience



Dr. Noel brings the Histopathology Room to life during one of the tours



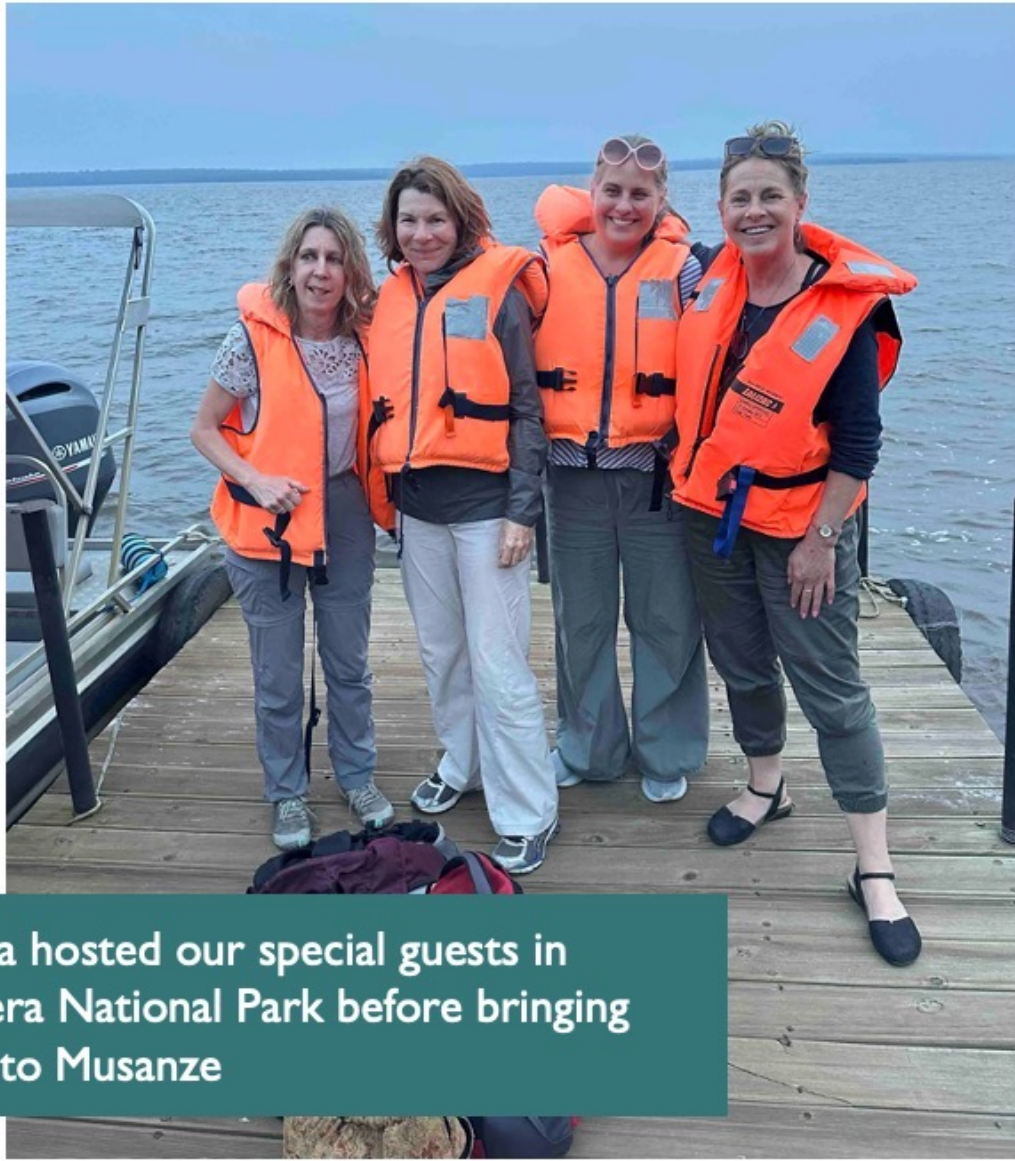


From left: Dr. JC, Dr. Benard, Dr. Methode, Dr. Nelson, Dr. Tierra, Dilly, Dr. Fred, Dr. Noel



Photo courtesy of Judy Stampler

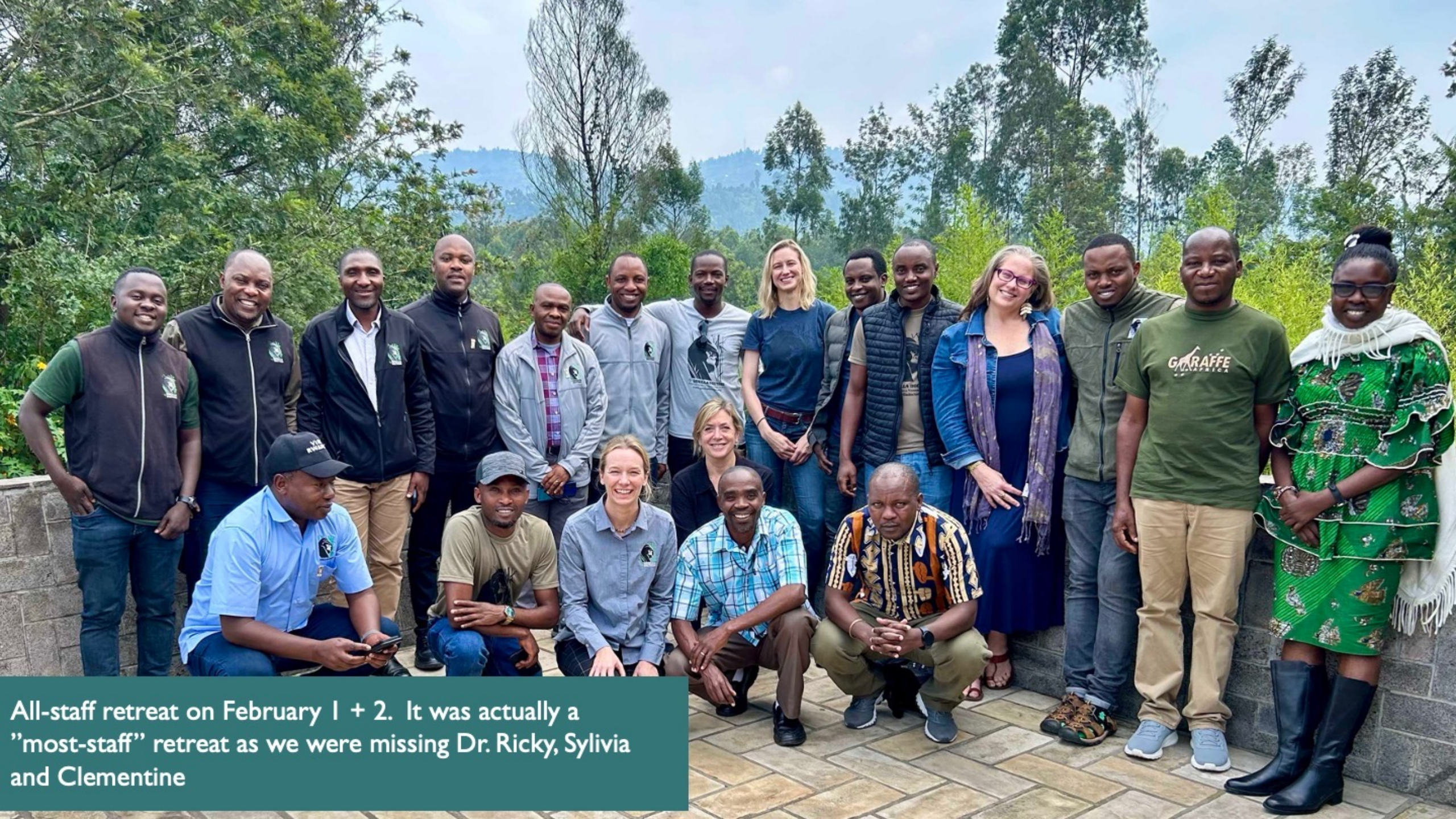
Donna and Amy dining with visiting donors:  
(from left) Philippa Norman, Sue Petit and  
Judy Stampler after the lab dedication



Donna hosted our special guests in Akagera National Park before bringing them to Musanze



They met Chief Park Warden, Prosper Uwingeli before their gorilla trek



All-staff retreat on February 1 + 2. It was actually a "most-staff" retreat as we were missing Dr. Ricky, Sylvia and Clementine