



# Centre ValBio

*Madagascar*

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*Annual Report*  
*2022*



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*Uroplatus phantasticus*



## History of CVB

In 1986, primatologist Patricia Chapple Wright was given a seemingly impossible task: to travel to the rainforests of Madagascar and find the greater bamboo lemur, a species that hadn't been seen in the wild by scientists for thirty years. Not only did Dr. Wright discover that the primate still existed, she proved that it lived alongside a completely new species, the golden bamboo lemur. What followed was a love affair with an animal and a country that continues to this day. Dr. Wright is best known for her study of lemurs in Ranomafana National Park ('RNP'), which she helped establish in 1991.

Centre ValBio ('CVB') was created by Dr. Wright in 2003 under the Institute for the Conservation of Tropical Environments' agreement with the Government of Madagascar. The richness of the critically endangered plants and animals, contrasted with the poverty of the people, inspired her to help both survive in harmony.

### *CVB's mission is:*

- To promote world-class research and biodiversity training opportunities in one of the world's most biologically diverse and unique ecosystems
- To promote environmental stewardship by providing conservation education and ecologically sustainable economic opportunities within local communities
- To provide the local people with knowledge and tools to improve their quality of life

## Statement of Purpose

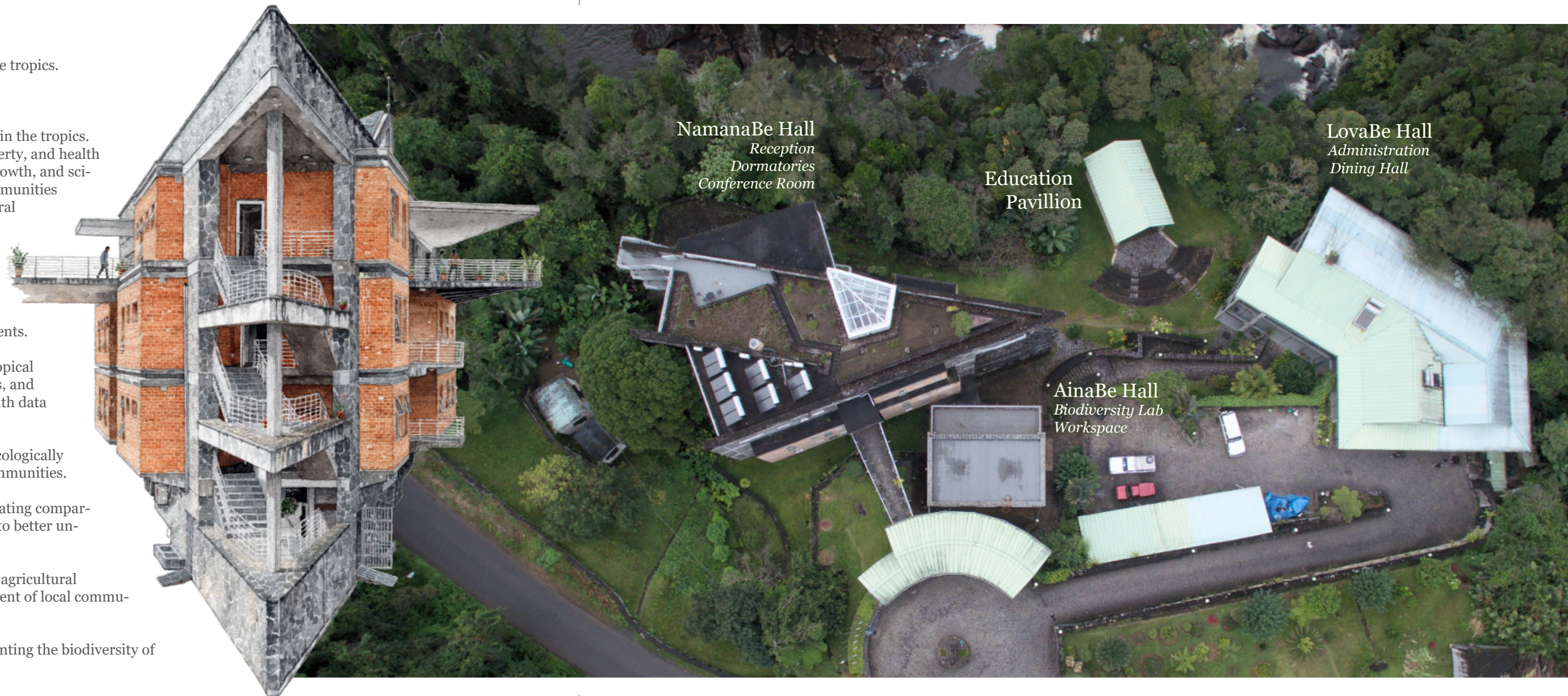
Inspiring passion for biodiversity and conservation science in the tropics.

## Mission Statement

CVB's mission is to be the standard-bearer for research stations in the tropics. By approaching the interrelated problems of climate action, poverty, and health with the interrelated solutions of quality education, economic growth, and scientific innovation, we hope to demonstrate that sustainable communities and reduced inequality are possible alongside a flourishing natural environment.

## Goals

- To inspire innovative approaches to biodiversity research and conservation and provide training opportunities in one of the world's most biologically diverse and unique environments.
- To fully understand the complete ecosystem dynamics of a tropical rainforest, including mapping an entire ecosystem's genomics, and connect this with climate, environmental, and household health data to inform local practices, public policies, and global debates.
- To support environmental stewardship in conjunction with ecologically sustainable economic development for the local Malagasy communities.
- To be the coordination center of a network of field sites facilitating comparative research within Madagascar and also across the tropics to better understand regional and global biodiversity dynamics.
- To integrate ecological restoration, education, human health, agricultural improvement, natural resource conservation, and empowerment of local communities in a One Health framework.
- To develop comprehensive natural history collections representing the biodiversity of Ranomafana National Park.





## Letter from the Executive Director

In October, Dr. Kelly Lambert, a behavioral neuroscientist from the University of Richmond, came to CVB to carry out a pilot study. Back in the U.S., she studies the brain and behavior of raccoons and rats, but in Madagascar she gave the same behavioral tests to mouse lemurs to see the food and nest material choices they make. We used our large outdoor cages and made a "proof of concept" for the upcoming NIH and NSF grants. This is a promising new research dimension for CVB. Dr. Richard Hunter, a professor of psychology at the University of Massachusetts' Boston campus, also did a dissection of a four year old male *Propithecus edwardsi* from Vohiparara.

Tabula Madagascar, our project aimed at studying the genomics of a whole rainforest ecosystem, was pushed forward by the arrival of a liquid nitrogen generating machine at CVB. Clara Tucker of SBU joined lab coordinators Mahery and Haja to begin the flash freezing of the plants and insects that mouse lemurs eat. We will be examining the genomics of the niche of these smallest of primates. Our next step will be getting the samples back to Stony Brook, Rockefeller, and Stanford for analysis.

In 2022, we also had three major storms hit our region. Tropical Cyclone Ana arrived in January, followed by Tropical Cyclone Batsirai on February 7th, which hit our region head on. Ranomafana was flooded, the bridge to the thermal baths was destroyed, and many homes

of our staff were damaged. CVB stood strong and didn't suffer any damage. We raised funds to help our staff.

Two weeks later, a third cyclone hit, and this time Dr. Tom Gillespie of Emory University and I were filming in the rainforest with Juliette Binoche, a well-known French actress and Academy Award winner, renowned for films such as *The English Patient* and *Chocolat*. Despite the rain and wind, we successfully filmed the sifakas in Talatakely. Later, we planted 250 trees for an optimistic ending for the film, *Making Pandemics*. The film should be released in English in 2023. In July, the cover article of Smithsonian Magazine was on the Forbidden Forest of Ivohibory. It is wonderfully written, with equally beautiful photos.

In December, the Canadian Broadcasting Corporation's Natural History unit spent two weeks at Ranomafana filming both the sifakas and the ongoing restoration ecology in the area. Their series will also be aired in 2023. I also went to Rochester, New York to receive the Conservation Warrior Award from Seneca Park Zoo. While there, I had the opportunity to lead a discussion at the Rochester Institute of Technology.

Shortly after, Dr. Tom Gillespie, Michael Docherty, Dr. Richard Bankoff, Ashley Maggy, Fanny Cornejo, Katherine Kling, and Grant Rogers went to Montreal for COP 15. Dr.

Mittermeier and I gave talks at the Malagasy Side Event. Unfortunately, Benjamin Andriamihaja could not obtain his visa for Canada and the Malagasy Minister of Environment was also unable to attend.

This year, I am most proud of our two Malagasy research staff, Laza Andrianandrianina and Dina Andrianoely. Laza earned his post-graduate diploma in International Wildlife Conservation Practice at Oxford University in the UK and Dina earned a graduate certificate in Endangered Species Management from the Durrell Conservation Academy in Jersey. Congratulations to both.

Michael Docherty, who has been an outstanding Chief Operating Officer for CVB for nearly five years, has decided to move on. His steadfastness and good judgment throughout the pandemic was commendable. His many achievements included the last three beautiful Annual Reports, his organization with management and finance, his enthusiasm and guidance with our health, education and reforestation teams, and lastly, a foosball table to entertain our staff at lunchtime. His parting gift was a barbecue grill and a gazebo constructed on the river side of NamanaBe Hall. Michael, we will miss you.

Our Board played a strong role in advising this year and one of our Board members, Wai Poc, convinced Kearney, Inc. to develop a strategic plan for the next five years, pro bono. This was a huge effort on everyone's part to create the plan in time to bring to Montreal in December,

but we made the deadline. It is an important document that will guide CVB for the next decade.

This year, 2022, has indeed been a renaissance of health, research and conservation. My sincere thanks to our outstanding CVB staff, our persistent researchers and our generous donors that made this year a success.

With best wishes,

Dr. Patricia C. Wright  
Founder and Executive Director  
Centre ValBio



*Cheirogaleus crossleyi*

# Highlights of the Year

External Visitors | Activities Attended by CVB Staff  
Workshops and CVB Activities | External Events

<p><i>February 7</i></p> <p>Cyclone Batsirai hits Madagascar</p>	<p><i>February 22</i></p> <p>Cyclone Emnati hits Madagascar</p>	<p><i>March 11–29</i></p> <p>Biodiversity assessment in Manombo with Health in Harmony</p>	<p><i>April 28–May 1</i></p> <p>Team from Mission Green survey potential sites in RNP for the construction of the canopy walkway</p>	<p><i>June 27–July 1</i></p> <p>Teacher training workshop with CVB Education and Partner Teachers</p>	 <p><i>Propithecus edwardsi</i></p>	<p><i>November 7</i></p> <p>Tabula Madagascar begins flash freezing</p>	<p><i>November 29</i></p> <p>Inauguration of Michael Docherty's grill and gazebo on CVB campus</p>	<p><i>December 11–16</i></p> <p>Ecological and Epidemiological Modeling (E2M2) workshop</p>
<p><i>February 7–April 29</i></p> <p>Dina Andrianoely goes to Jersey for the Durrell Endangered Species Management (DESMAN) Graduate Certificate</p>	<p><i>February 20–24</i></p> <p>French actress Juliette Binoche visits RNP to film <i>Making Pandemics</i></p>	<p><i>March 5–September 30</i></p> <p>Laza Andrianriana goes to Oxford to complete his Post-Graduate Diploma in International Wildlife Conservation Practice</p>	<p><i>April 6–8</i></p> <p>British Ambassador to Madagascar David Ashley visits CVB</p>	<p><i>May 30</i></p> <p>Arrival of 15 SBU Summer Study Abroad students</p>	<p><i>November 15–18</i></p> <p>CRS Workshop; 45 participants</p>	<p><i>November 30</i></p> <p>Departure party for Michael Docherty with Ambassador's environmental officer</p>	<p><i>December 7</i></p> <p>Dr. Patricia Wright wins Seneca Park Zoo's Conservation Warrior award</p>	
 <p><i>Hypsipetes madagascariensis</i></p>	<p><i>July 8</i></p> <p>Smithsonian publishes cover article on the Ivohiboro Protected Area</p>	<p><i>August 20</i></p> <p>Inauguration of Ivohiboro Protected Area</p>	<p><i>September 18</i></p> <p>Arrival of 11 SBU Fall Study Abroad students</p>	<p><i>October 4–13</i></p> <p>The Primate Cognition Project with Dr. Kelly Lambert and Dr. Richard Hunter</p>	 <p><i>Prolemur simus</i></p>			

*August 22*

Arrival of 26 Study Abroad students from Anglia Ruskin University UK

*Oct. 11–12*

Madagascar Soap Project workshop with Chris Coulter and Dr. Caroline Rojoso

*Oct. 22–Nov. 7*

Second biodiversity assessment in Manombo with Health In Harmony

*August 28*

Arrival of CVB's new liquid nitrogen generating machine

*October 26–28*

ADRA workshop; 29 participants



2022 was a year marked by revival. The past two years of COVID-19 have been tough not only on people, but also on the environment and wildlife. While our long-term studies on endangered lemurs and our entomology and botany collection projects were able to continue, we began to see more research projects on forest use and degradation during the pandemic. We are also seeing increased interest in topics related to the intersections between the environment and human health, such as the risk factors associated with zoonotic and anthroponotic pathogens among people, domestic animals, and endangered lemurs, endoparasites and the impact of close human proximity, and research centered around the “One Health” concept.

In 2022, we also celebrated the creation of the Ivohiboro Protected Area with the Ministry of Environment and Sustainable Development. Many researchers already started pilot studies in this unique ecosystem and will be continuing their research there in 2023 and onward.

I sincerely appreciate the passion and dedication of our board, our donors, and readers like you, who help to keep our mission going. I am very optimistic about 2023!

*“No matter how hard the past is, you can always begin again.”* —Jack Kornfield

- Dr. Benjamin Andriamihaja  
ICTE Country Director



Since the start of the COVID-19 pandemic, Centre ValBio’s activities remained severely impacted, and the continuation of field work and expeditions was uncertain. However, 2022 brought with it their promising return to CVB. The Mobile Health Team, Tropical Ecology Assessment and Monitoring (TEAM), the Reforestation Team, and research projects were able to finally resume their expeditions. Being able to return to normalcy was especially important for biodiversity conservation in the region, as CVB activities have both direct and indirect impacts on local populations living around the Ranomafana National Park, and of course on the habitat where biodiversity lives. 2022 also brought more researchers back to Madagascar to resume their studies. With the help of CVB staff and research technicians, we were able to accomplish important projects with Environmental Education, Reforestation, the Tabula Madagascar pro-

ject, Catholic Relief Services and SPICES, and other collaborations. The use of technologies such as Zoom continued to allow CVB staff to attend and participate remotely in conferences, workshops, and meetings, which keep them up-to-date on important work in the conservation, education, and health fields. We were also excited to partake once again in celebrations like the International Day for Environment and World Lemur Day.

Thanks to the great leadership of Dr. Patricia Wright, Dr. Benjamin Andriamihaja, and Michael Docherty, and the hard-working and diligent CVB staff, Centre ValBio was able to see the promising return of Centre ValBio’s activities in Ranomafana and the surrounding area this past year.

- Pascal Rabeson  
CVB National Director

It never rains but it pours – literally! This year CVB had to contend with cyclones Batsirai & Emnati, but thanks to our steadfast board, donors, & staff, we were not blown off course.

We are cautiously emerging from COVID-19, with SBU study abroad returning as well as a new group from Anglia Ruskin University. Hosting such opportunities is a vital part of our mission to develop the next generation of researchers, so their return is welcome.

During the year we commenced an upgrade of CVB’s water purification system, with equipment sufficient for all of the upper campus project. We are laying the foundation, literally, for the next phase of CVB’s growth.

In April we welcomed David Ashley, the UK Ambassador, as he surveyed cyclone damage in the south. Along with our new connection to Anglia Ruskin, this is a testament to CVB’s international focus.

On a personal note, after four and a half intense years I have taken the decision to step away from CVB. My memories of this incredible journey, and the unbelievable international team that made it all possible, will always be with me. I now happily position myself in the proud spectator’s box to watch the organisation flourish and grow!

- Michael Docherty  
ICTE/CVB Chief Operating Officer



It still amazes me how well CVB’s song of progress has maintained its harmony despite a very trying year. We welcomed a number of remarkable new researchers and volunteers, each one drawn to study and help protect the forest ecosystem we call home. Study abroad is also slowly starting to recover to pre-pandemic levels, and the sounds of curiosity and learning by these future researchers can be heard trumpeting above the patter of rain in the forest.

This year’s accomplishments in the technology lab and design studio included the final certification flights on Razana in the USA, a long endurance drone system capable of flying up to 150 miles per flight, designed to transect the entirety of the park. This home-grown tool,

available for use in 2023, will allow scientists the first close-up aerial access of the park and provide daily status reports of its health and status. Meanwhile, the IT team has been hammering away on beam and post, getting ready to finalize the new server room and data center for AinaBe in 2023.

Despite all the troubles of the world trying to dampen our tone, the song of progress at CVB has begun to crescendo once again. Through the efforts of our amazing staff, and your help, we will crank this tune back up to 11 in 2023.









- Jesse McKinney  
ICTE/CVB Chief Technology Officer



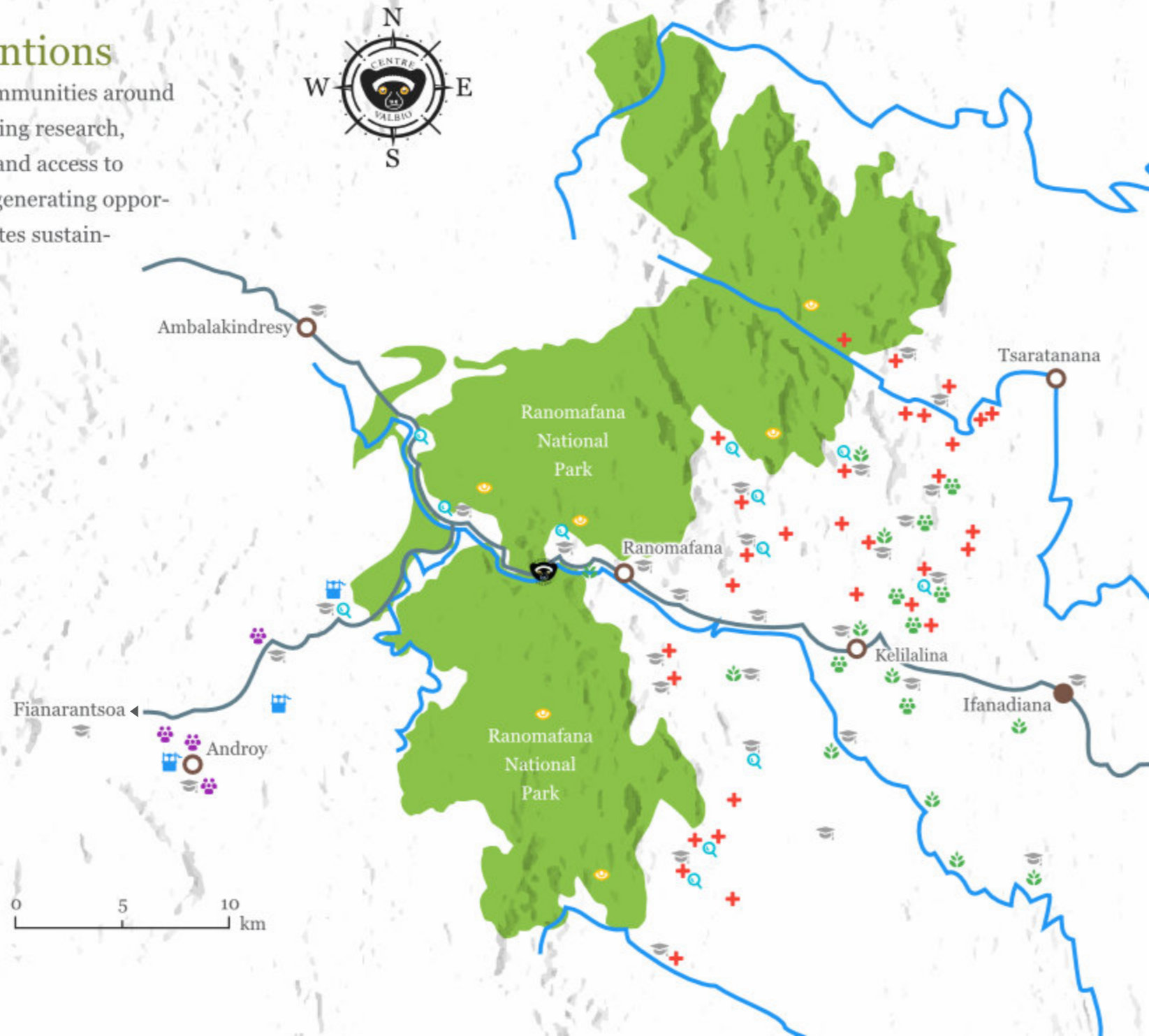
## Map of CVB Interventions

Centre ValBio is active in over 75 communities around Ranomafana National Park, conducting research, providing environmental education and access to healthcare, and supporting income-generating opportunities via reforestation that promotes sustainable agroforestry.

### Key

-  Conservation Club
-  Conservation Club & Reforestation
-  Reforestation
-  Health
-  Education
-  Participatory Ecological Monitoring
-  TEAM
-  Boreholes / Wells

-  Road
-  River
-  District
-  Commune



*Coa reynaudii*

## Researchers

Diego AYALA, Olivier ROUX, and RAHOLA Nil (all Institute for Research for Development/Institut Pasteur de Madagascar) conducted research on mosquitoes in Ranomafana and Tsaratanana.

Andrea BADEN (Hunter College) and Katie SEELEY (Columbus Zoo) worked on the darting of *Varecia* in Mangevo.

Mariah DONOHUE (University of Kentucky) continued her research on the role of intestinal microbiomes in speciation and sexual selection in *Eulemur* hybrids in Ranomafana, Ambalavao, and Vondrozo.

Julian GLOS (University of Hamburg) researched the ecophysiology of amphibians in Ranomafana National Park.

Laura GOMEZ DEVIA (TU Dresden/IDIV) studied fruit traits across altitudinal gradients in Mangevo.

Lindsey HAUFF (Rutgers University) investigated rapid evolution in Malagasy species in Ranomafana National Park.

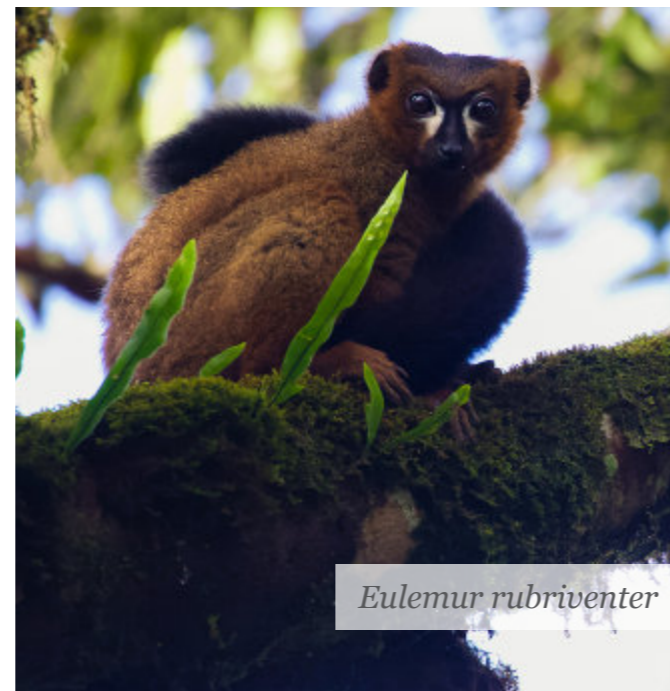
Sheila HOLMES (Swedish University of Agricultural Sciences), Mahefa ANDRIAMAVOSOLOARISOA, Fenontsoa Rojomalala RATSIMBA, and Minoseheno RAKOTOVAO (all University of Antananarivo) worked on the Rewilding Madagascar project to determine how the presence of seed dispersers impact carbon

storage, biodiversity, and human livelihoods in reforested areas.

Judith JANISCH, Lydia MYERS, and Nicole SCHAPKER (all Northeast Ohio Medical University) studied the ecological influences on the locomotor performance of wild primates in Ranomafana National Park.

David KLINGES (University of Florida) and Tsitohaina RANDRIAMBOLOLONA (University of Antananarivo) assessed climate and deforestation vulnerability of arboreal reptiles in Ranomafana National Park and Ambalavero.

Arielle LIU (University of Arizona) and Mirana RAHARINIAINA (University of Antananarivo) studied glucocorticoids and thermoregulation



behaviors in the face of global warming in *Eulemur rubriventer*.

Stephen LOCE (Stony Brook University) and Hajanirina RAKOTONDRAINIBE (University of Antananarivo) researched ectoparasitism in *Propithecus edwardsi* in Talatakely and Sahamalaotra.

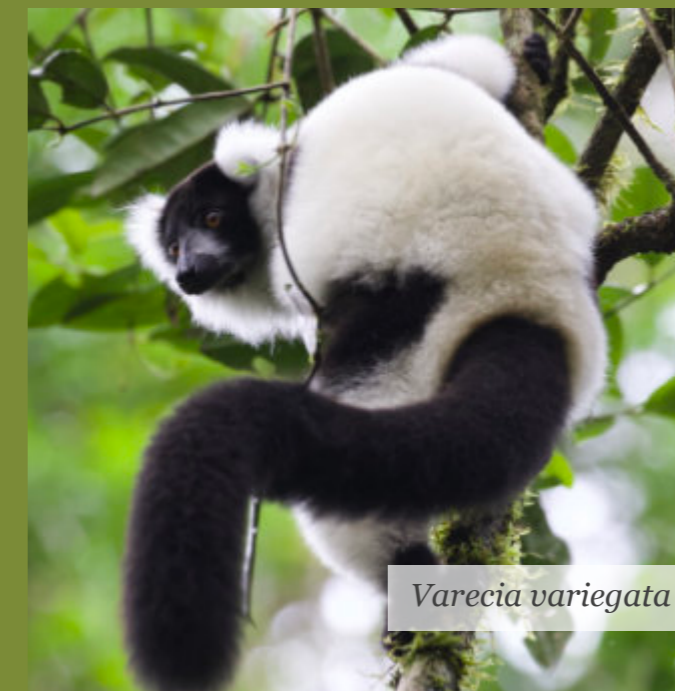
Pamela NARVAEZ TORRES, Melody PETERSEN, Amanda SEYLER (all University of Calgary) and Mirana RAHARINIAINA (University of Antananarivo) continued their work on the TEAM project in Ranomafana National Park and Kianjavato, where they used camera trap monitoring to assess mammal and plant diversity on the forest floor and in the forest canopy.



## Hasinala Ramangason

I am a PhD candidate under the supervision of Dr. Steig Johnson at the University of Calgary. My research seeks to understand how frugivorous lemurs choose fruits in varying nutritional landscapes and how they digest their foods when their diets change seasonally.

Frugivory in lemurs has long intrigued scientists because Madagascar is characterized by highly unpredictable fruiting patterns and poor fruit quality, resulting in low selective pressure to evolve a fruit-dominated diet. Yet, lemurs of the genera *Varecia* and *Eulemur* have high degrees of frugivory, and researchers have puzzled over how these lemurs maintain nutritional health and complement their



diets with resources for which their guts are ill-equipped. I combine behavioral follows, nutritional modeling, and fecal functional genomics to better understand how frugivorous lemurs survive on such a risky diet.

My initial plan was to investigate these questions in Kianjavato and Ranomafana to understand what it takes to be a frugivorous lemur in degraded and pristine environments, respectively. After a Category 4 cyclone in early 2022 made it impossible to carry out a pilot study in Kianjavato, I moved to Ranomafana National Park, which had sustained less damage.

Although cyclones are suggested to be a significant driver of the evolution of the endemic biota in Madagascar, there is limited data on

how they actually affect plants and animals on the island. Starting in March, we had the unique opportunity to collect phenology, lemur movement, and feeding data in the aftermath of another major cyclone in Ranomafana. Fruiting season in Ranomafana spans from November to April, and generally peaks in April, after which the fruit scarce season starts. Following the cyclone, we found extremely low fruiting intensity and fruiting diversity and a greater reliance of frugivorous lemurs on leaves. These altered fruiting patterns occurred during what would normally be the fruit abundant and peak period. This indicates that the cyclone induced an earlier onset of the fruit scarce season and that lemurs would undergo an extended lean season in 2022.

While the cyclone initially forced me to significantly revise my project, I later realized that the way the cyclone altered fruit availability allowed me to better investigate how frugivorous lemurs survive in challenging nutritional landscapes. I came back to the field in October to start fecal sample collection. Performing functional genomics analysis on feces that were collected at the very end of the extended fruit scarcity season will unravel how frugivorous lemurs physiologically navigated through this very challenging period. There are no “better” circumstances to understand what it takes to be frugivorous lemurs in challenging nutritional landscapes. I am grateful for all the organizations that fund my project: Rufford Foundation, Primate Conservation Inc, National Geographic, the Leakey Foundation and the University of Calgary.





## Amanda Rowe

Our project researched factors influencing night-active lemurs in Madagascar's last remaining transitional dry forest, the Zombitse-Vohibasia National Park, to use in its management and conservation plans. Our research team completed a comprehensive study of the community interactions of four night-active lemur species (gray mouse lemur, pale fork-marked lemur, fat-tailed dwarf lemur, and Coquerel's giant mouse lemur). Specifically, we studied how these species consume insects (their most significant nutritional resource), mapped how they avoid competition with peers and other species, and combined dietary, spatial, activity time, habitat, and disturbance data to gauge how coexisting lemur species respond to fluctuating ecosystems. As a result, we identified key dietary resources and other factors that should guide the management and conservation plans for these animals.

Within the national park, we identified a suitable study location where we completed 8.5 months of biodiversity research and four months of community assessments. We built 19.5 km of transects and completed 342 kilometers of nocturnal surveys to characterize the population and diet of the four study species. Over 184 nights of live trapping, we captured 556 lemurs of four species from which we collected 130 tissue samples, 178 hair samples, and 830 fecal samples. Due to the difficulty in capturing pale fork-marked lemurs, we used radio collars for 72 night follows to collect 54 fecal samples for dietary analyses.

*Phaner pallescens*

To understand how forest community differences drive differences in space use, we completed botanical surveys on ten plots and cataloged 2,409 individual tree species. To assess the availability of insects as a resource, we sampled insects over 18 nights at five locations. We also collected weather data continuously for approximately six months. This work is the first long-term research to be conducted within Zombitse-Vohibasia National Park, as well as the first work to characterize the diet of lemurs using molecular methods.

In addition to the biodiversity work, we assessed two communities to help future relationship development in nearby communities, promote long-term research in the area, and develop a research and conservation plan. This first step in community-based conservation used household surveys of local communities in the national park region to understand the economic, political, ecological, and social factors influencing them. We used the results from 38 focus groups and 398 household surveys in 199 households representing 870 people to gather insights into how these communities relate to the forest, current threats and their causes, perceptions around conservation, the effects of internal migration on people in the region, and natural resources in the area.

Through our work, we helped to develop positive local perceptions of scientific researchers and established relationships with community officials in the area, which should help future researchers working in this area.

Linh Mai Nhat NGUYEN (German Center for Integrative Biodiversity Research) used ecological, chemical, and genomic tools to research the evolution of fruit scent as a signal for seed dispersal in Ranomafana National Park.

Beatriz OTERO JIMENEZ, Jason ANAND-APPA, Alexandra ANGELOFF (all University of Central Florida) and Clara TUCKER (Stony Brook University) continued collecting, flash-freezing, and exporting arthropod and plant species from mouse lemur habitat as part of the Tabula Madagascar project.

Chloe POULIN (Aquaya) studied pathogen pathways in Manakara.

Hafaliana Christian RANAIVOSON, Angelo ANDRIANIAINA (both University of Antananarivo), and Dominic DANIELS (University of Chicago) researched bat-born pathogens in Manombo.

Hobiniala RAZAFINDRASOA (IHSM), Christinah Deborah RABESAMIHANTA, Mihajatiana Tanjona RANDRIANIRINA (both University of Antananarivo), and Hasinala RAMANGASON (University of Calgary) studied *Varecia Variegata* behavior and diet in Valohoaka.

Onja RAZAFINDRATSIMA, Katherine CULBERTSON, Raine ZULUETA (all University of California, Berkeley), Tanjoniaina RABARIJAONA, Hasinavalona RAKOTOARISOA, Veronarindra RAMANANJATO, Finaritra RANDIMBIARISON (all University of Antananarivo), and Emma Hall (Kingston Univer-

sity London) researched seed dispersal technology and plant-animal interactions from the individual level to population and community levels.

Jadelys TONOS LUCIANO (University of California, Berkeley) studied plant resources and lemur movement in Valohoaka.



## Dr. Kelly Lambert

Professor of Behavioral Neuroscience  
University of Richmond, VA (USA)

Can the smallest primate on the planet provide clues about the mental health of one of the largest primates—humans? I was thrilled to explore this question by looking at flexible problem-solving strategies in wild mouse lemurs (*Microcebus rufus*) at CVB. In my research area of behavioral neuroscience, it is becoming increasingly apparent that we have to look beyond traditional rodent research models to diverse species living in natural habitats to understand the universal truths of the nervous system. Although the brown mouse lemur is similar in body size to rodents, their primate brains differ from popular rodent research models. Accordingly, the mouse lemur has captured the attention of researchers interested in learning more about how primate brains flourish in various experiential and environmental settings.

At CVB, we examined *Microcebus*'s performance in cognitive assessments—a foraging tree associative learning task and a grasping problem-solving task. My colleague Dr. Richard Hunter and I are interested in exploring the use of “Living Laboratories” to assess biological and behavioral markers of mental health. Therefore, the temporary habitats we created represented the most natural setting we could provide for the animals. Preliminary analyses confirm the mouse lemurs’ proficiency with the foraging tree and problem-solving tasks—they were high-achieving students!

The importance of natural surroundings in neurobiological investigations became apparent when we assessed our second group of mouse lemurs. As my colleague Dr. Hayley Hesselin and I weren’t knowledgeable about where to find appropriate branches and leaves for the temporary habitats when we prepared the new arenas, our effort resulted in décor that was less plush than the first habitats prepared by informed CVB technicians. The animals in the new environments exhibited more caution during their foraging task habituation trials. The marked changes in their somewhat sparsely decorated new environment appeared to prompt a healthy level of suspicion. After adding more ecologically relevant flora, we immediately noticed that the mouse lemurs were back in the problem-solving business!



After three decades of learning valuable information from laboratory animals, I am currently focusing my attention on the investigation of more diverse brains in varied settings. Natural settings such as Madagascar’s CVB provide a treasure trove of discovery opportunities to learn more about what makes brains tick. Richard and I are excited about the future of this research initiative and are optimistic that these small primates may be the key to unlocking lingering mysteries related to healthy lifestyles and sustained neurobiological health.

Dr. Lambert’s most recent book *Wild Brains: Nature’s Guide to Neural Flourishing* will be published by Princeton University Press in 2024.



## Dr. Richard Hunter

Director, Developmental and Brain Sciences Program

Associate Professor of Psychology  
University of Massachusetts Boston (USA)

As a neuroscientist interested in how genomes interact with the environment to produce brains and behavior, I was excited to visit Centre ValBio in the company of Dr. Patricia Wright and my friend and colleague Dr. Kelly Lambert in October 2022. Modern neuroscience has focused on working with animals living in very controlled environments, as well as specific parts of the genome, in its search to explain how we use our brains to adapt to the environment and how we sometimes fail and develop mental illness. However, laboratory

animals live vastly simpler lives than humans, or indeed wild animals, so we likely miss the contribution of the environment when examining them. Furthermore, our focus on protein coding genes, which comprise less than 5% of our genome, ignores the complexity of the vastly larger non-coding genome, which likely provides levels of regulatory complexity and flexibility than presently understood. Thus, I’m very excited by the behavioral results we obtained with *Microcebus rufus* during our visit and I hope to be able to link them to changes in non-coding elements of the *Microcebus* genome in future work.

In addition to our behavioral work, we were able to begin a project of modernizing the neuroanatomy of lemurs with dissection of a

Milne-Edwards sifaka (*Propithecus edwardsi*) and a fat tailed dwarf lemur (*Cheirogaleus medius*). This coming year, we will analyze their brains using MRI and histology with colleagues at Harvard University and Washington University to compare their structures to those of other lemurs and other primate species including our own. The “Living Laboratories” approach we hope to pursue will allow us to map how the social and physical environments of these animals shape their temperament and behavioral strategies in concert with their genes. I hope in future visits to begin to analyze genomic data being collected with Tabula Madagascar to better understand how the different environments of Madagascar have shaped lemur brains and behavior.





## Laura Verbeek

To uncover why Milne-Edwards's sifakas (*Propithecus edwardsi*) have low infant survival rates, I came from Wageningen University in the Netherlands to study their maternal behavior. For four months, I collected behavioral and GPS data on sifaka mothers, recorded weather variables, and took fecal samples for hormone analyses. The collected data will help answer the question of how sifaka maternal behavior changes before and after birth and how this behavior influences infant survival and development. I hope that answering these questions will not only give us more knowledge on the Milne-Edwards's sifaka, but that it in turn could help us protect the infants better and therefore the next generation of sifakas.



## Alba Schielen

In 2022, I visited Centre ValBio for my master's internship at Leiden University. I worked with Dr. Patricia Wright on a translocation project for the greater bamboo lemur (*Prolemur simus*). The *P. simus* is a critically endangered species and conservation measures are needed to ensure their survival. My research involved observing the last known individual of *P. simus* within Ranomafana National Park. This allows us to create a reference of behavior for comparison after other individuals of *P. simus* are translocated into the park from an external location. One interesting behavior I was able to observe was "playing" and mutual grooming between the *P. simus* and the *Haplemur aureus*, or the golden bamboo lemur.



## Justin Philbois

I examined the impact of strawberry guava, an invasive species, on tropical forest insect communities. Alongside Centre ValBio's insect team, I measured six different functional traits of more than 2,000 insects. The insects were collected and identified in different vegetation types in Ranomafana National Park, both with and without guava. These specimens were then labeled and stored in the CVB Insectarium. Our results showed that insects in areas with guava tended to be smaller and have more specialized diets. However, smaller insects imply a reduction in the number of bigger predators from those areas in which strawberry guava is present, which, in the long run, can cause a total change in the forest's food chain.

## Nina Beeby

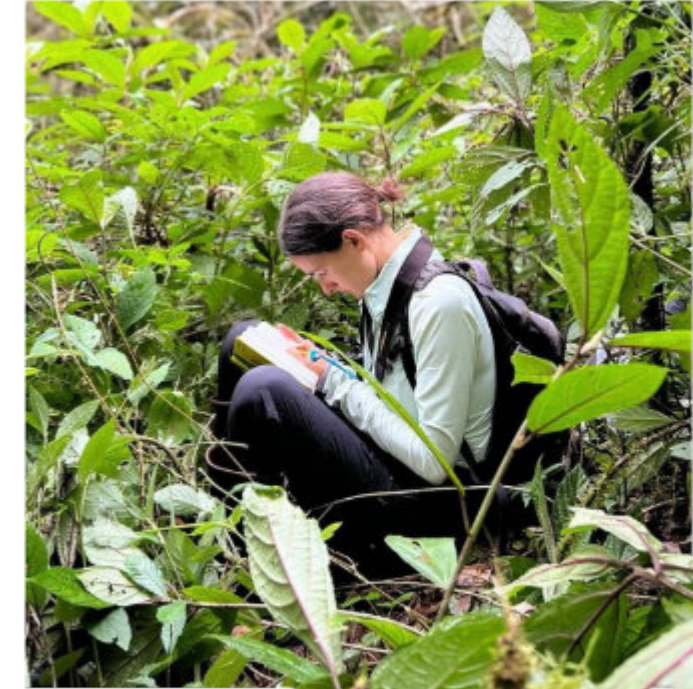
Nina Beeby, a PhD candidate at the City University of New York, has been studying the black-and-white ruffed lemur (*Varecia variegata*) since 2018. She is currently working with Dr. Andrea Baden's field team in Mangevo and Talatakelo.

The goal of Nina's research is to understand the impacts of habitat quality on the behavior, nutrition, and energetics of this critically endangered lemur. Ruffed lemurs are both anatomically and physiologically constrained to frugivory and unlikely to extract much energy from fiber fermentation typical in leaf-eaters. Their unique life history and behavioral characteristics are likely constrained by this ability to acquire sufficient food and nutrients in their highly seasonal habitat. By observing and taking samples of their diet, and collecting urine over a 12-month period, Nina will assess how this species responds to environmental unpredictability and prolonged periods of fruit scarcity. Additionally, by comparing the condition of ruffed lemurs in two differently disturbed habitats (Talatakelo and Mangevo), she will be able to identify resources that are most crucial in supporting their presence in Madagascar's eastern rainforests.

Alongside Dr. Amanda Mancini, Nina's team has also been collecting GPS range use and accelerometry data on selected individuals at the two sites. This data will be paired with forest structure data to understand how habitat quality impacts ruffed lemur movement ecology.



*Varecia variegata*





## Carly Batist

I am a PhD candidate in Biological Anthropology/Primateology at the CUNY Graduate Center. I use Passive Acoustic Monitoring (PAM) to survey black-and-white ruffed lemur populations in southeastern Madagascar. By setting up specialized recorders that can run on their own for weeks in the forest, I can look specifically for ruffed lemur vocalizations to assess the presence and distribution of the species without needing people on the ground, saving precious time, labor, and money. Despite its huge potential for scaling up biodiversity monitoring efforts, PAM is not yet widely used in Madagascar. The conservation of the critically endangered black-and-white ruffed lemur is particularly crucial because they are important



seed dispersers and pollinators in Malagasy rainforests. My project focused specifically on employing PAM within the COFAV rainforest corridor that connects Ranomafana and Andringitra National Park. The corridor is incredibly remote and the terrain is very difficult, making systematic surveys of animals nearly impossible. However, after 7 months, my team and I were able to deploy recorders at 35 sites across the forest. To sort through the approximately 9,000 hours of recordings, I am using machine learning models which can automatically detect and extract ruffed lemur calls. These detections, when combined with GPS data on the spatial distribution of the recording devices, can then be used in ecological models to estimate and map ruffed lemur distribution throughout the COFAV. This will

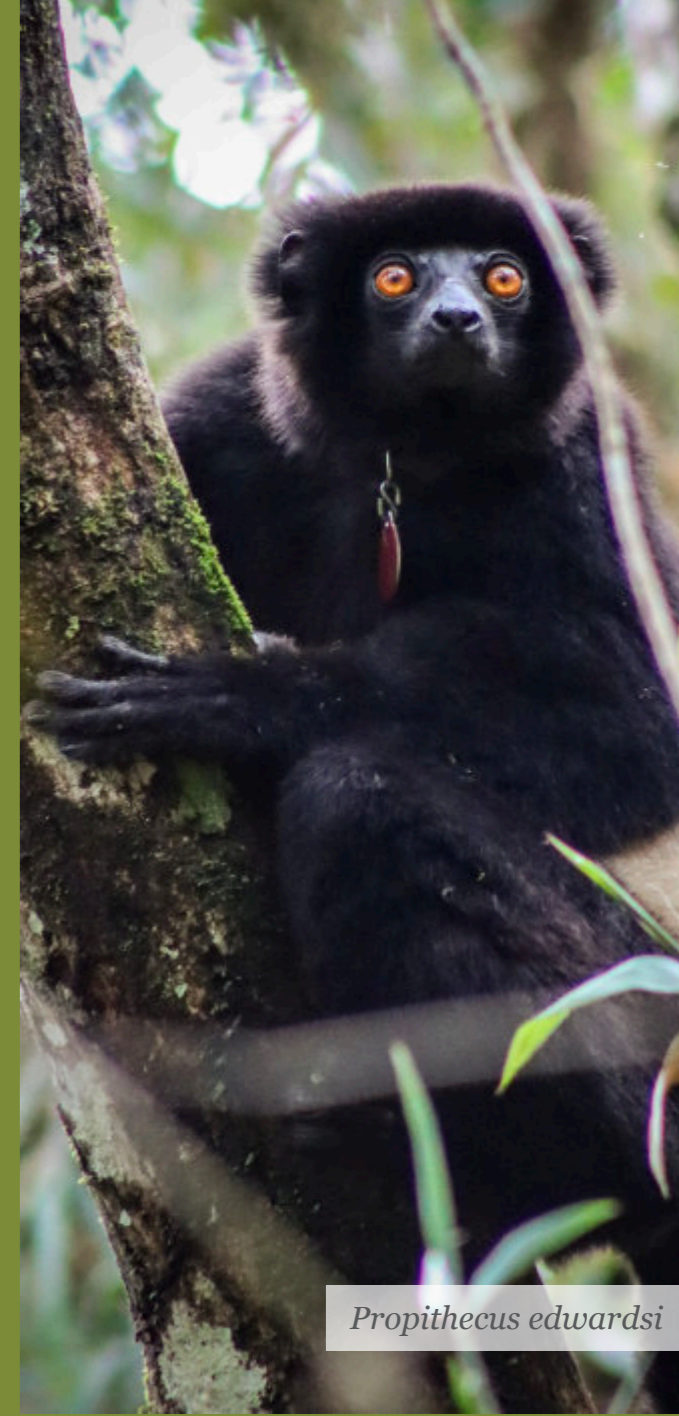
provide up-to-date population surveys and help identify conservation priority areas.

Over the course of this project, we developed working relationships with about 30 community forest management groups, funding local guides and building collaborations for future research. I also led a hands-on training workshop at CVB to train other researchers, field technicians, park staff, and students on how to conduct PAM research. The recording devices continue to be used for further projects I am collaborating on with various Malagasy stakeholders. Because these same recordings can be used to detect other species present in the corridor, I will archive all my data in the online repository Arbimon so that others can use this valuable dataset as well.

## Florian Emo

This year, I had the exciting opportunity to conduct a primatology study in Ranomafana National Park. Researching lemurs in Madagascar has been a dream of mine since childhood because, contrary to what many people think, lemurs are an extremely complex and exciting group of primates. Not only are there more than a hundred species, but each one plays a critical role in maintaining healthy forests. Despite this, many lemur species are threatened by the fragmentation of their habitats by human activity.

The goal of my project was to provide a better understanding on the survival of Milne-Edwards's sifaka (*Propithecus edwardsi*) populations. I focused on their feeding ecology and, more specifically, on the influence of sociodemographic factors, pregnancy, and temporal and phenological variations in the diet of this species. While in the field, I followed several groups of Milne-Edwards's sifakas in both a disturbed forest and a primary forest for three months. By combining my observations of their feeding behaviors and preferred diet with long-term data from the last 15 years, as well as botanical and nutritional data collected by researchers at Centre ValBio, I was able to correlate this information and ensure the best accuracy regarding the influence of temporal variations on food ecology. My hope is that this study will provide a better understanding of the impact of Milne-Edwards's sifaka groups and their environment on the diet and health of individuals within those groups.



*Propithecus edwardsi*



We studied plague risk at the household level. Previous research showed that *P. irritans* is the most abundant species found inside homes, but the infestation varies considerably among households in the same village. As plague-control resources are limited in developing countries, identifying the parameters and the behaviors favoring flea infestation is key to developing preventive measures that can be implemented in households.

We used a structured questionnaire and observational checklist to collect quantitative and qualitative data from 120 households in four rural villages within a plague-endemic area of Madagascar. Fleas were sampled during the dry and rainy seasons using candle traps set for three successive nights in each household.

## Dr. Adelaide Miarinjara

Dr. Adelaide Miarinjara is a postdoc at Tom Gillespie's lab at Emory University, researching the eco-epidemiology of bubonic plague in Madagascar and the capacity of the human flea, *Pulex irritans*, to transmit *Yersinia pestis*, the plague bacterium.

Of the 40 species of fleas found in Madagascar, less than 10 affect human health, with the human flea being a vector of bubonic plague. The plague disease burden is still high in the central highlands, with cases found annually during the rainy season. However, the role of the *P. irritans* in bubonic plague transmission remains understudied.



Candle traps are used to catch house-dwelling fleas

*P. irritans* was found in almost all samples, confirming that it was the most prevalent species in households. Our preliminary analysis showed that houses with thatched roofs, floors covered with woven plant fiber mats, and owning numerous chickens were among the predictors for high flea burden. Furthermore, higher flea infestation was recorded in families of more than 5, and in households where the head of household and/or their partner did not finish primary school. Our analysis suggests that improvement in housing and better management of the livestock may alleviate the flea burden in rural villages experiencing high flea infestation. The observed socio-ecological risk factors for flea infestation suggest the need to improve plague vector control strategies in Madagascar.



The team animating an information session with village leader



## Michael Bliss

I researched lemur populations within the Corridor Forestier d'Ambositra Vondrozo (COFAV), an unprotected eastern rainforest corridor connecting many national parks and protected areas. I chose two understudied sites which have been particularly difficult to access for researchers.

The first site was Ankarimbelo, approximately three and a half days' travel south of Ranomafana. Over a month, our research team created and scanned transects for lemurs and performed botanical plots. The site, which was largely disturbed by recent cyclones, revealed several groups of red-bellied lemurs, golden and gray bamboo lemurs, and woolly lemurs.



We also recorded one group of Milne-Edwards' sifaka, two groups of white-collared brown lemurs from a potentially hybrid population, and a single aye-aye and rufous mouse lemur. Local villagers informed us that the black and white ruffed lemur and the greater bamboo lemur were historically found at this site but have since retreated from the area or become locally extinct. Cyclones create gaps in the forest canopy and destroy fruiting trees, not only impeding the lemurs' movements, but also depriving frugivorous species of a significant portion of their diet. However, despite the damage, the lemur populations in Akarimbelo appeared to remain intact.

The second survey site was Bemahala, approximately four days' travel south of Ranomafana.

The suspected presence of dahalo—cattle raiders – reduced our time spent in the field. Our two transects and one botanical plot revealed only one group of white-collared brown lemurs, but not the gray bamboo lemurs historically known to have been present here. The clear-cut periphery and edge habitats of this forest restrict lemurs' dispersal patterns, and their possible use as food by the dehalo creates the perfect conditions for local extinction.

My time in Madagascar was so much more than the brief summary above. I am very appreciative to my research team, guides, and the staff at Centre ValBio. I would also like to thank Dr. Patricia Wright for this remarkable opportunity to study endangered lemurs in their natural habitat.



## Laza Andrianandrianina

This year, I was lucky enough to get selected for the Postgraduate Diploma in International Wildlife Conservation Practice at the Department of Zoology of the University of Oxford. Each year, eight young conservationists from around the world are selected to participate in this intensive full-time program.

Over the course of my eight months at the Wildlife Conservation Research Unit, I learned the most updated skills and theories in conservation, including field data collection methods and topics such as habitat assessment, species and biodiversity monitoring, population management, and conservation education. I also attended the Student Conference on Conserva-

tion Sciences in March 2022 and visited the Museum of Zoology in Cambridge.

I built professional connections outside of my academic training by meeting conservationists and conservation NGOs operating internationally at workshops organized by the University of Oxford. With the help of Dr. Peter Long from Oxford Brookes University, I also visited various practical ex-situ conservation programs such as those carried out at Durrell Jersey Zoo, Chester Zoo, the Royal Botanical Gardens in London, the British Bird of Prey Centre in Wales, and at different museums.

I am proud to have completed the course with distinction, the highest mark given, and as first in the class.



## Dina Andrianoely

This year, I had the exciting opportunity to join the 2022 cohort for the Durrell Endangered Species Management (DESMAN) Graduate Certificate in Jersey in the British Channel Islands. The DESMAN course ran from February 7<sup>th</sup> to April 29<sup>th</sup>, and through the Alison Jolly Madagascar Scholarship Fund, I also had the chance to also participate in an 18-month professional development program for conservation managers. At the conclusion of the course, the University of Kent awarded me an internationally recognized formal qualification certificate.

For me, the DESMAN course was a chance to focus on my professional growth in the field of



conservation. As my main responsibilities at Centre ValBio are in biodiversity management and GIS, my courses on research design, statistical analysis, population monitoring, spatial analysis of ecological data, conservation education, and threats to biodiversity helped to reinforce and improve my understanding of endangered species management. Additional courses on leadership built up my skills in fundraising and grant-writing, team management, and communication, which will be invaluable for my work at the Centre ValBio. Given the Durrell Conservation Academy's close proximity to Jersey Zoo, I also had the unique opportunity to work closely with the zoo's animal and veterinary departments and to learn about animal care in captivity and ex-situ conservation programs.

I finished the DESMAN course with a strong network of classmates, colleagues, alumni, and international experts with whom I can share knowledge and get support as I realize my own wildlife and habitat conservation projects in Ranomafana National Park.

I want to extend my gratitude to Dr. Patricia Wright, Centre ValBio, Durrell Wildlife Conservation Trust, and especially Dr. Tim Wright and Dr. Helen Gath at the Durrell Conservation Academy. Special thanks also goes to the Alison Jolly Madagascar Scholarship for granting me this experience.



## Dr. Richard Bankoff

As a researcher with over a decade of experience studying the ecology and conservation of Madagascar's eastern rainforests, I am thrilled to take on the role of ICTE's Biological Data Manager. In this position, I have the privilege of overseeing the creation of a digital repository of data from more than 35 years of research in the area around what is now Ranomafana National Park. This treasure trove of ecological, climatological, primatological, and anthropological data is unrivaled by any other field site in Madagascar and will form the core of CVB's data crucible.

The data crucible will be a searchable collection of CVB's historical datasets that will foster

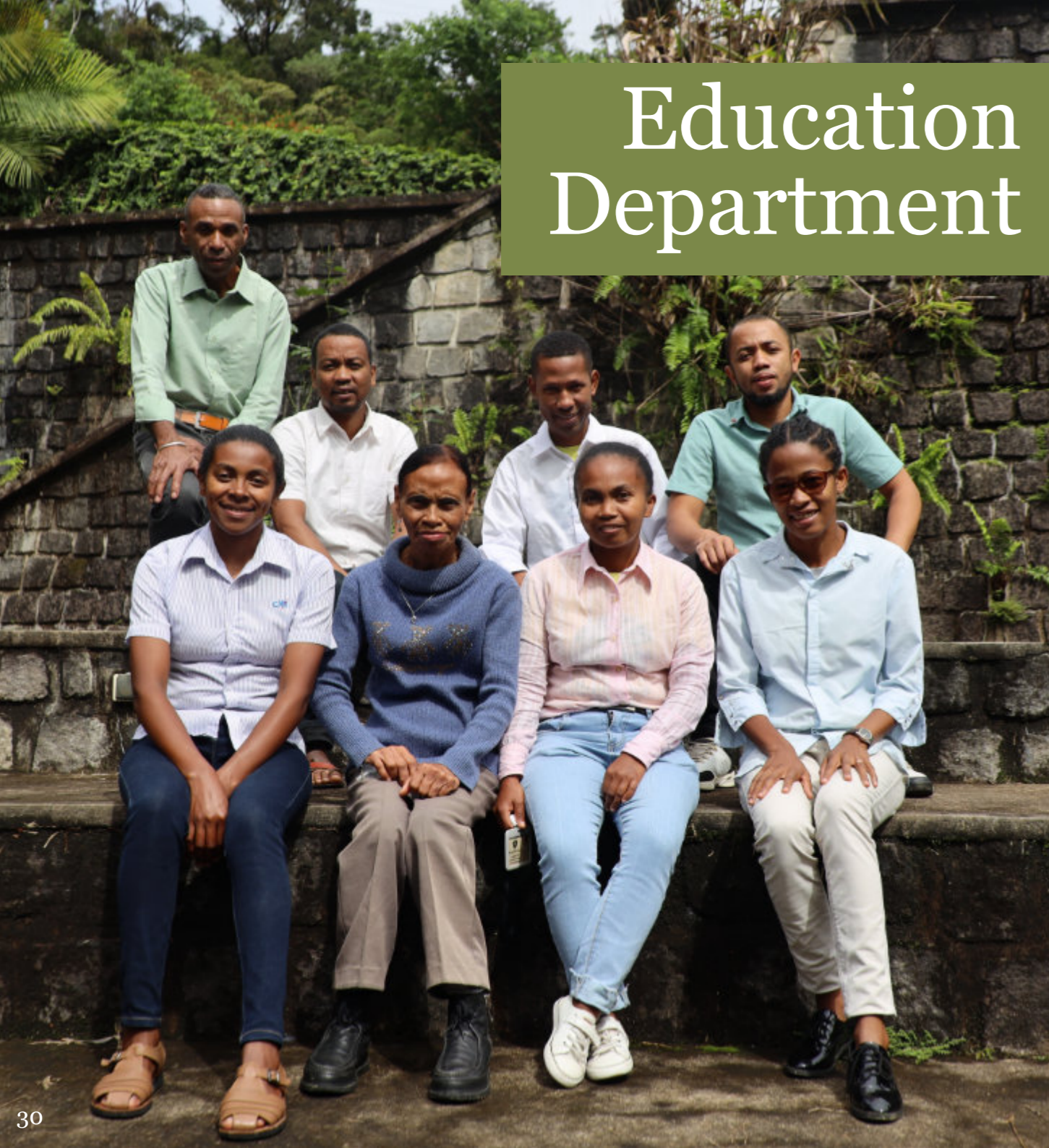
collaborations, preserve and promote the work of generations of researchers, and enable retrospective evaluations of conservation effectiveness. The datasets include hundreds of media files, drone flight logs, records of paleontological expeditions, years' worth of lemur observations, and public health data. This resource will not only reduce the overhead burdens of data management on research staff, but will also provide the next generation of conservation scientists with a robust and easy-to-use platform from which to launch historically contextualized investigations.

One of the key features of the data crucible will be direct entry of field data, eliminating the need for manual entry and reducing the potential for errors. The data crucible will also eventually include analytic tools for researchers to do on-the-fly analyses of custom datasets marshaled from CVB's database. This will enable researchers to quickly and easily access and analyze the data they need, allowing them to focus on conservation and scientific research rather than data management.

I am excited to develop a world-class data infrastructure that will showcase, share, and grow the impact of the critical work being done by Centre ValBio's research teams not only in Ranomafana, but also Ivohiboro, Zombitse, and Ivato Karianga. Once operational, the data crucible will ensure that the invaluable research conducted at CVB is preserved for future generations, informing and enriching conservation efforts and scientific discoveries.



# Education Department



## Conservation Clubs

In November of 2022, representatives of the Conservation Clubs, comprising 30 members from 10 different villages, had the opportunity to participate in outside training for capacity building on agricultural techniques. Held at Conseil d'Expérimentation et Formation en Fruits et Légumes (CEFFEL), or the Training and Experimentation Center for Fruit and Vegetables, in Antsirabe, the session was devoted to the establishment and maintenance of a fruit tree nursery, the adoption of agroecological practices, the setting up of a vegetable garden, and a visit to the nursery of Ambatolahy. This opportunity for the Conservation Clubs was made possible through the partnership between CVB and TSIRO Alliance, who funded the trip to Antsirabe.



## My Rainforest My World Park Visit

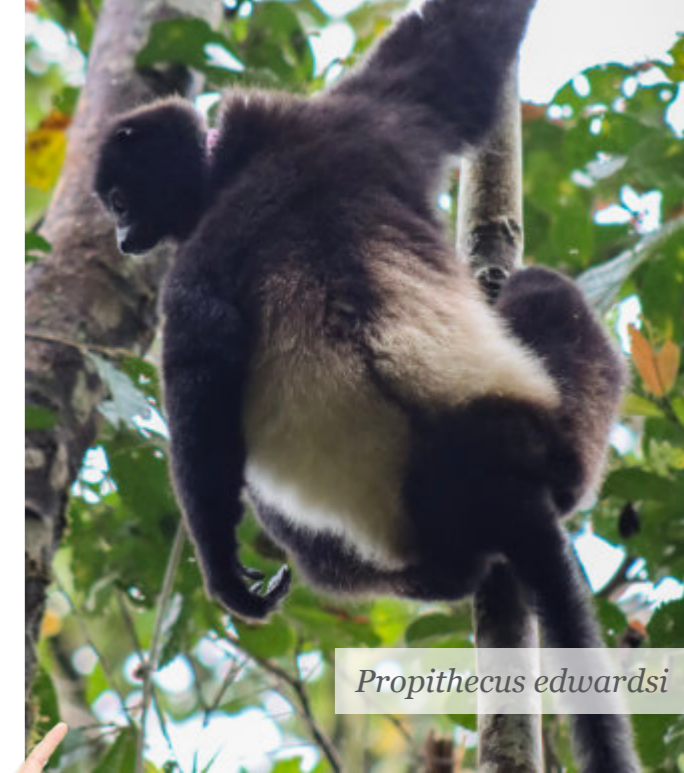
A park visit is an excellent opportunity for students to positively engage with their natural environment through watching, appreciating, and learning more about wildlife and the diverse habitats they live in. Thanks to the Apenheul Primate Conservation Trust, 246 students and 28 teachers from 11 schools were able to not only walk through Ranomafana National Park, but also tour Centre ValBio. Following the visit, an art workshop was prepared so that the students could paint their favorite animal.

## Madaworks

Created in October 2015, Madaworks is a non-profit CVB project organization that aims to change girls' lives by providing them with scholarships to pursue their studies through



high school. Not only did ten girls graduate from the program in 2022, but Fianakaviana Sambatra (FISA) Fianarantsoa, in partnership with Madaworks, organized a training in Comprehensive Sexuality Education (CSE) for young girls. It was held at Centre ValBio from April 19<sup>th</sup> to April 22<sup>nd</sup> and was centered around empowering the girls with knowledge that allows them to be able to achieve their full potential. CSE is recognized in Madagascar as a vital effort to enable adolescents and youth to improve and protect their health, well-being, and dignity, help them develop critical thinking and citizenship skills, and healthy, positive relationships. This training was possible through the collaboration between CVB and the Population Health Environment (PHE) network members.



*Propithecus edwardsi*



**989**  
students receiving  
environmental education



**544**  
Conservation Club  
members



**27**  
trainings organized for  
the Conservation Clubs



**43**  
expeditions





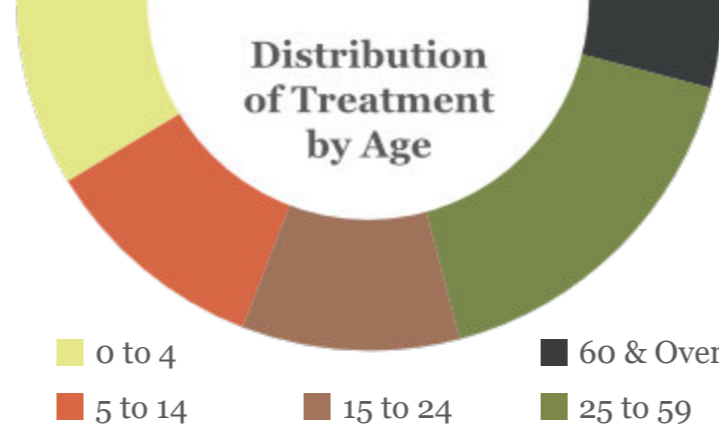
# Health Department

2022 was another successful year for the CVB Mobile Health Team, which has now grown to six full-time doctors and nurses. Dr. Thomas Razafimanisa joined the Team in March, followed by Dr. Fleurah Zafindrabibisoa, who took over as Head of the Health Department in July. The team was also joined by two nurses, Nurse Jean Claude and Nurse Tanteliarisoa, in November 2021.

The number of villages served by the Mobile Health Team also grew in number. We are happy to report that as of 2022, they have expanded their reach to another five remote villages around Ranomafana National Park, for a total of 29 villages.

In total, the Team carried out ten expeditions over the course of the year and 2,434 patients were received and treated in the four main intervention areas. Respiratory illnesses remain the most prevalent health issue faced by patients, although the Team noted a sharp increase in the number of skin affections between the months of July to October, likely due to swimming in unclean water during the hot season.

The Team also continued to provide important culinary demonstrations to local women as part of their mission to combat malnutrition. This year, 53 demonstrations were given across 28 different villages, training a total of 597 women. Each demonstration uses locally available ingredients specific to each village. This makes cooking healthy and affordable meals more feasible for families.



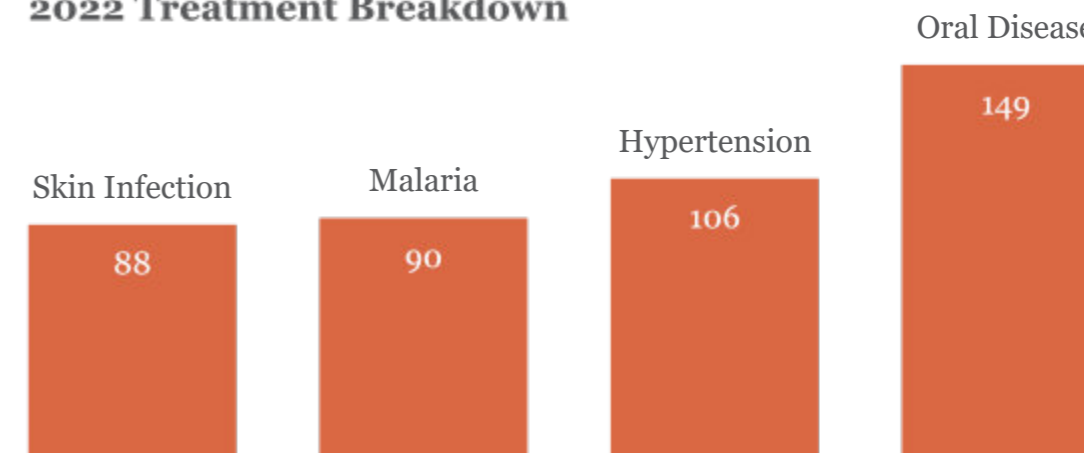
In July, a group of high school students from Culture Connect joined the Health Team for their expedition to the village of Ankazotsara. While there, they were able to shadow the doctors and nurses to learn about health care delivery in remote areas.

Looking forward to 2023, the Health Team is excited to begin a new collaboration with MSI Reproductive Choices, an NGO that works with Madagascar's government to bring family planning and reproductive health services to villages around the country. Together with the CVB Health Team, they plan to make birth control implants and intrauterine devices (IUDs) accessible to local villagers around Ranomafana beginning in May 2023.

In collaboration with Lucky Iron Fish, the Team also plans to launch a project to fight iron deficiency caused by malnourishment. Ten villages have been selected to carry out a study on this iron supplement's effectiveness, whose study population will be women of childbearing age (18 to 45 years old). This will be an important step in ensuring long-term prevention of iron deficiency in families.

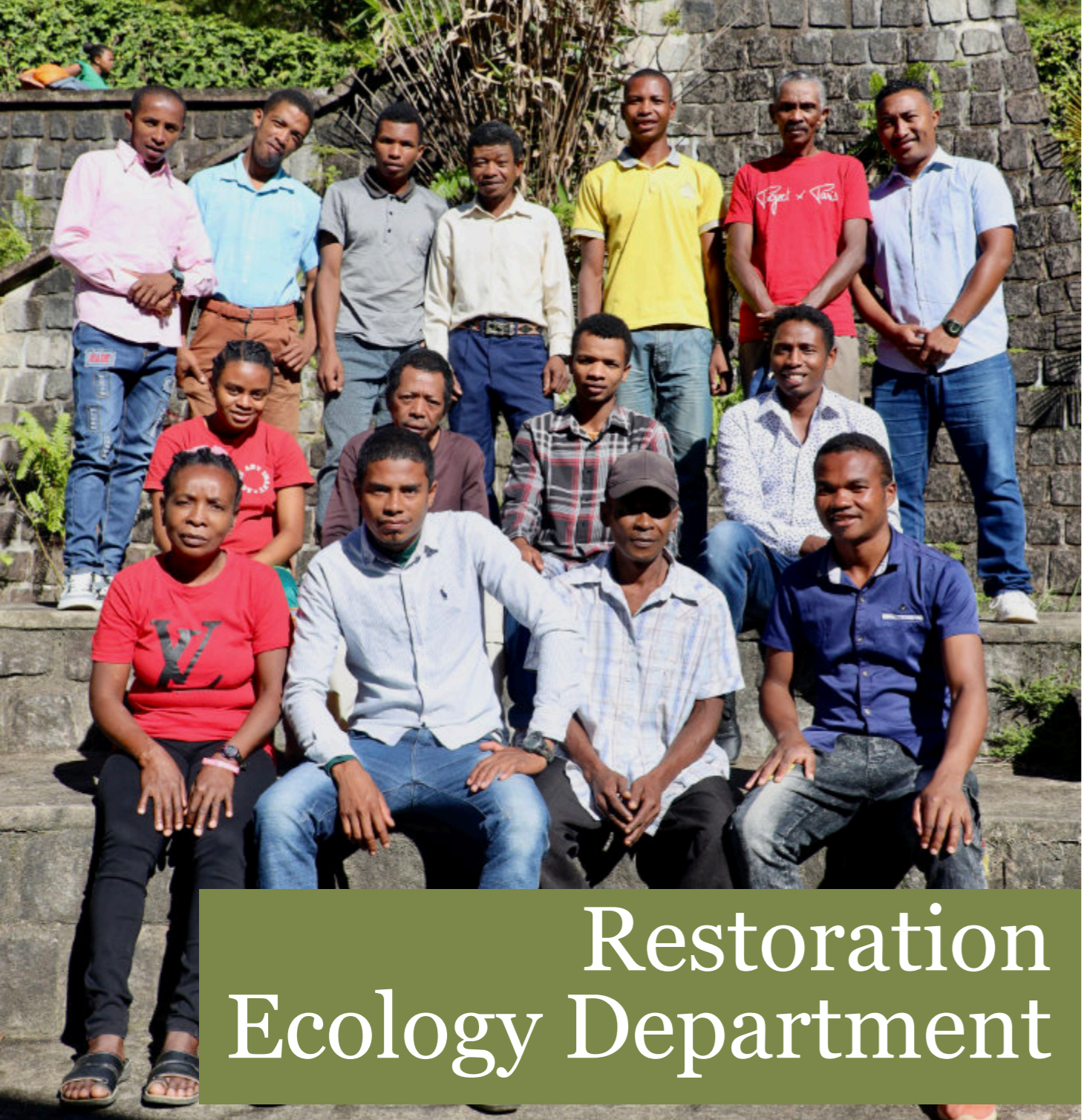


## 2022 Treatment Breakdown



Respiratory Health

541



# Restoration Ecology Department

**Introduction**  
2022 proved to be a fruitful year for the Reforestation Team, as we rebounded from the disruptions caused by COVID-19. This year, we were excited to realize many of our activities and collaborations under our new name: the Restoration Ecology Department. Despite the damage inflicted early 2022 by Cyclones Batsirai and Emnati, we still accomplished vital reforestation and restoration work through our regular CVB activities and the SPICES, Ecosia, RANO WASH, and TerraMatch projects.



**CVB's Regular Activities**  
This year, CVB'S upper campus tree nursery produced 9,070 seedlings, of which 3,383 were already planted. The remaining 5,687 will be planted at the start of the 2023 reforestation campaign. Tree plantings were conducted by Madagascar National Parks, Culture Connect, the NGO Vozama, and the Reforestation Team during the filming of *Making Pandemics*, with Director Marie-Monique Robin.

However, starting July 2022, seed-collecting activities within Ranomafana National Park were halted. Fortunately, through a close collaboration with the DREDD Vatovavy Fitovinany and CIREF Mananjary, we resumed col-

lecting seeds in forests outside the park boundaries starting in September. This was accomplished through a seed collection convention, and as a result, the Team collected approximately 640 kg of seeds this year for planting in the nursery.

**SPICES Project**  
Although the Vatovavy region was critically hit by Cyclones Batsirai and Emnati, the SPICES project was still able to continue its crucial work in this area. Our initial activities were centered around cyclone damage relief, and only after ensuring recovery from the storms was the Team able to resume their planned activities for 2022. The main goal of the Team this year was to promote the use of native tree species in reforestation projects, agroforestry



systems, and renewable and sustainable energy. The Reforestation Team worked diligently to collect and distribute native tree species' seeds to the SPICES nurseries, although, we were not able to, distribute as much as in previous years due to seed collection issues. Fortunately, however, the main species distributed was *Bridelia tulasneana*, which can produce over 5,000 seedlings from a single kilogram of seeds! The team was also able to plant about 19,900 native tree seedlings, with about 39,350 seedlings waiting to be planted in 2023. In total, the SPICES project planted 167,807 saplings of spices, fruit trees, and endemic trees, with 248,431 saplings remaining in stock. As seed collection resumes, we expect that 2023 will be yet another busy year for reforestation.

### *Ecosia Project*

Most of the reforestation sessions with Ecosia were carried out during the first quarter of the year. But, following a drought, several planting sessions were held throughout the year to replace the dead seedlings. This year, 10,607 seedlings were planted, for a total of 300,009 since 2021.

Ecosia and CVB also organized an exchange opportunity between reforestation initiatives to share project implementation strategies. The exchange visit was held in Fort Dauphin, in the southeast. The NGOs targeted for this exchange visit included Tropical Biodiversity & Social Enterprise (TBSE) and Nitidae: Talaky Project, both of which have pre-existing reforestation initiatives in the Anosy region.



### *RANO WASH Project*

As part of the RANO WASH project, CVB aims to protect and improve freshwater infrastructure in Kianjanomby. The Team's conservation outreach included developing a school tree nursery to teach students about the importance of planting native trees and how to produce seedlings for long-term reforestation initiatives. As a result, the Team was able to plant 5,003 saplings near Kianjanomby's main freshwater source and another 606 saplings in school reforestation sites.

### *TerraMatch Project*

TerraMatch for AFR100 is a new project within the Restoration Ecology Department. Started in June 2022 with a goal of completion by December 2026, this collaboration aims to restore Madagascar's unique but rapidly vanishing ecosystems by planting 800,000 sustainable, high-value forest crops and trees within existing forests. This will enrich eco-



economic opportunities for local communities while also disincentivizing the destruction of forests. Our vision is to balance economic and livelihood needs with the urgent need to restore and expand one of the world's most precious biodiversity hotspots. With ambition, we see this project extending all the way from Ranomafana to the Indian Ocean. Three districts will be impacted by this project: Ifanadiana, Ambiabé, and Kelilalina. In 2022 alone, the Team was able to carry out 261 days of expeditions and 49 missions to these intervention sites, including visits to the local villages to determine restoration sites and construction sessions for the new nurseries. By the end of the year, the Team had confirmed 20 restoration and nursery sites each and set up 305,000 pots in 294 plant beds.



**147,907**  
*valuable crop seedlings planted*



**39,499**  
*endemic saplings planted*



**640 kg**  
*of seeds collected*



**3,490**  
*fruit trees planted*





## Anglia Ruskin Study Abroad

One of the things that university students missed out on during the COVID-19 pandemic was the chance to travel on field courses. So, as restrictions were lifted in 2022, it was wonderful to bring a group of 20 students from Anglia Ruskin University, UK, and two Malagasy students, to CVB to re-start our Tropical Ecology and Management field courses. It was the first time a group from our university has visited Madagascar and we were warmly welcomed by everyone at CVB.

The aim of our field courses is to teach students about tropical ecology and conservation,

and some of the field work techniques used to study tropical ecosystems. Perhaps more importantly, it gives students an experiential learning opportunity that they can only get from visiting a different part of the world, meeting some of the local people, and understanding how conservation operates in a different context from their home countries. Having the two Malagasy students with us was a real plus point in helping our students understand more about life in Madagascar, and they integrated very well with our students.

Despite some damp weather early on, the field trip was a success. Most days were spent in the forest, but we also visited the Ranomafana Arboretum and Anja Community Reserve. The two night walks we did were very popular and

accompanied by great excitement over finding numerous chameleons and frogs. Emile Rajerison was a favorite among the students and we enjoyed his guidance on the second night walk, when he led us from the Namorona River to his home. Fieldwork included a range of approaches. We started with measuring trees for stand profile diagrams and installing camera traps. We moved on to counting and observing lemurs, bird surveys, butterfly trapping, assessing levels of herbivore damage, and using model caterpillars to measure predation. Everyone loved the lemurs of course, and we got the chance to see plenty, including a demonstration of the safe handling of a brown mouse lemur (*Microcebus rufus*). We ran a moth trap from the top of Namanabe Hall, which attracted a comet moth (*Argema mit-*

*trei*) and 19 species of hawkmoth. The highlight of the camera trapping was getting two video recordings of fossa (*Cryptoprocta ferox*).

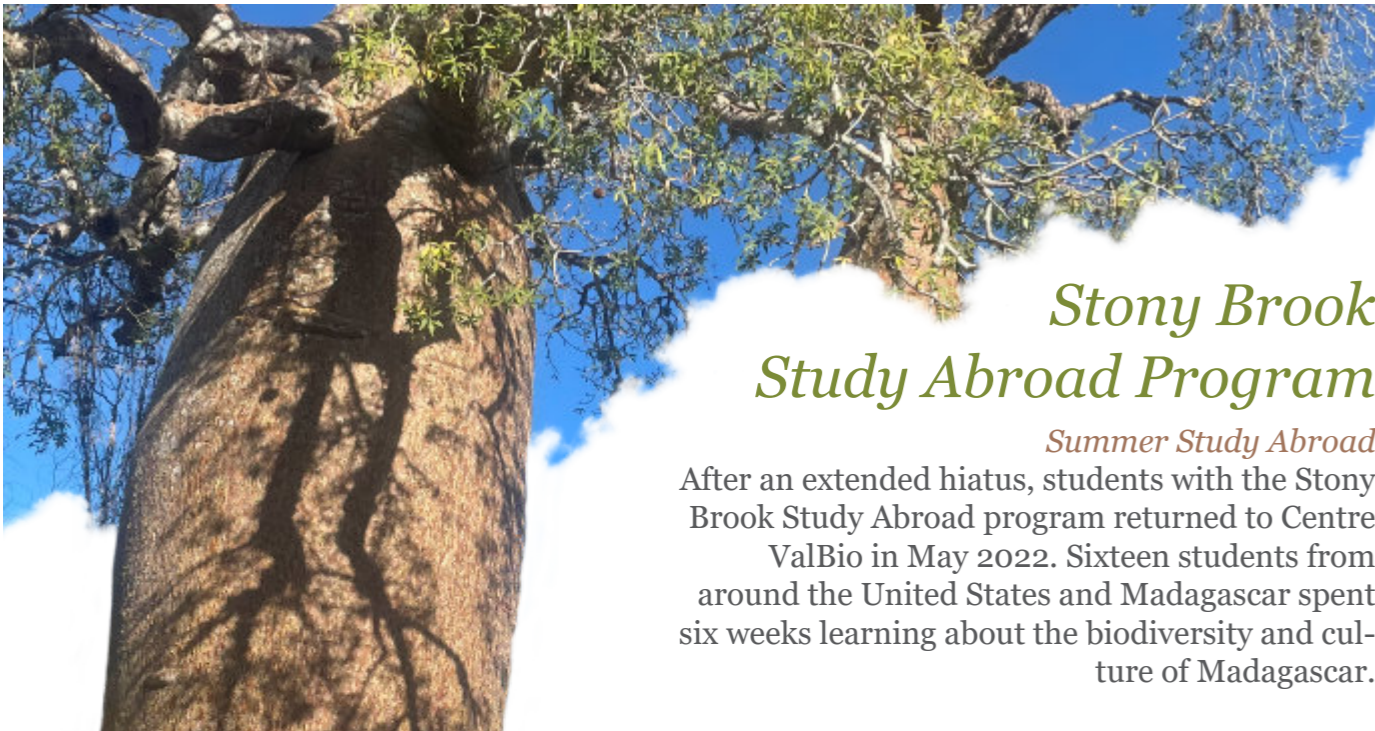
Although not at CVB, a final highlight was to meet up with Dr. Patricia Wright in Antananarivo, before we returned to the UK. It was great to meet her, having heard so much about her work. Later in the year, Dr. Wright was kind enough to give a lecture to our students in Cambridge via video link.

On behalf of the staff and students from ARU who came on the trip, I would like to thank everyone at CVB for their great hospitality and for making our return to the field a success.

- By Dr. Alvin Helden



*Cryptoprocta ferox*



## *Stony Brook Study Abroad Program*

### *Summer Study Abroad*

After an extended hiatus, students with the Stony Brook Study Abroad program returned to Centre ValBio in May 2022. Sixteen students from around the United States and Madagascar spent six weeks learning about the biodiversity and culture of Madagascar.



Lecture topics by CVB staff, researchers, Dr. Patricia Wright, and others ranged from lemur ecology to forest restoration and neglected diseases. The academic culmination was the students' independent research projects on topics of their choice, aided by CVB staff, Franck Rabe, and Teaching Assistant Grace Reamy.

One student cataloged indigenous knowledge on medical plants; another looked for microbial contamination of village wells; while another tested whether keeping livestock close when sleeping cut down on malaria in children. Most, however, focused on the extraordinary biodiversity of Ranomafana National Park. Although insects, birds, and chameleons were represented, lemurs were naturally the subject of many projects, including those focused on the impact of moon phase on lemur behavior, on their consumption of soil and plants during pregnancy, and on how lemurs stay warm during the surprisingly cool nights. I would say it was a once-in-a-lifetime experience for these young researchers, but I am lucky to be an alumna of the program, having attended in 2007 (which constituted ancient times to the current students.)

Attending the study abroad program changed the trajectory of my career, which has now brought me full circle to doing research at Ranomafana as a professor. I am certain the same will hold true for these students, and I look forward to working alongside them at CVB in the coming decades.

*- By Dr. Christina Bergey*

### *Fall Study Abroad*

No matter the stage you are at in your career when you experience a field-based course in a foreign country, it will change you forever, not only as a person but also as a student and a professional. The Study Abroad program last fall included a group of nine American and two Malagasy students, as well as Dr. Mónica Ramírez and Franck Rabe. Over our two and a half months in Madagascar, the students learned how to study lemurs in their natural habitats and how to research and measure biodiversity in one of the most incredible rainforests, Ranomafana National Park. They developed research proposals, collected data, and presented their results in front of an audience of Malagasy students and teachers at the University of Fianarantsoa. Their projects covered



a wide spectrum of topics from lemur parasites, frogs, reptiles, birds, and butterflies' diversity as well as prioritizing areas for regeneration that will connect lemur populations at the border of Ranomafana National Park.

The students also traveled to the coast to experience the spiny deserts and coral reefs, swam in blue natural pools at Isalo National Park, visited the ring-tailed lemurs at Anja Reserve, and laughed and played with kids at the lemur festival in Ranomafana. They grew friendships for life and learned to face a lot of challenges on the way. It was a great pleasure to see them grow as people and as future science professionals.

*- By Dr. Xyomara Carretero-Pinzón*





## *Armand Razafitsiafajato*

October 29<sup>th</sup>, 1957–July 17<sup>th</sup>, 2022

*Armand joined Dr. Patricia Wright's research team in the 1980s with keen skills in botany and endemic plants. Working with the phenology team, he monitored the fruiting and flowering of nearly a thousand rainforest trees each month. In 2000, he joined the CVB Research Department where his botanical knowledge was an important part of the TEAM (Tropical Ecology Assessment and Monitoring) network. He was a CVB botanist for many important expeditions, including to Ivohibory, Manombo, and Ivato. He was a good team player, quiet, and hard working. Armand died at the age of 65 of a heart condition. He is survived by his family in Ambodikimba. We will miss him.*



## CVB attends COP15

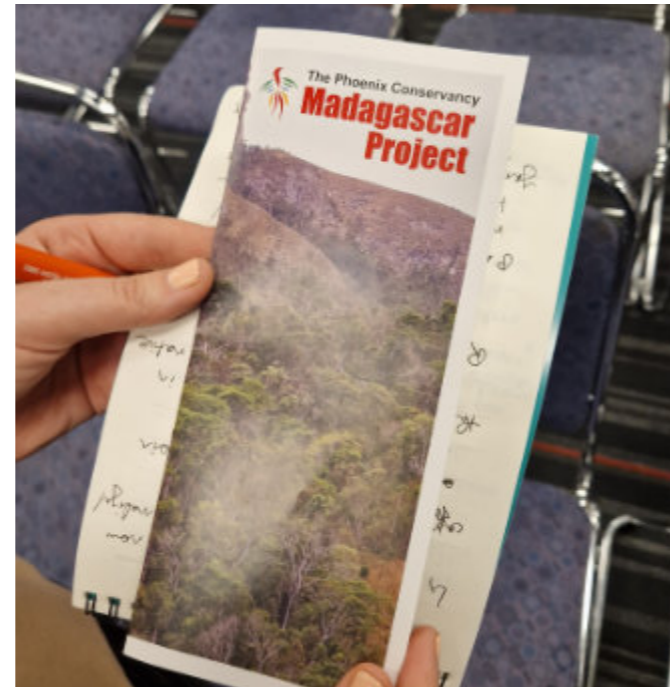
We are at a critical juncture in the race to preserve the biodiversity of Madagascar and, indeed, the whole planet. Therefore, this December, the CVB/ICTE team converged on Montreal as passionate advocates for Madagascar's people and wildlife at the UN Biodiversity Conference (COP15). This meeting continues the global effort started when the Convention on Biological Diversity was signed at the Earth Summit in Rio de Janeiro in 1993, and this movement has now grown to the point where 17,000 researchers, donors, and activists gathered in a freezing Montreal to hold politicians' feet to the fire and to sign the comprehensive agreement that our world desperately needs.

As part of the Malagasy government's official delegation, Dr. Wright gave an impassioned speech about the state of Malagasy conservation and potential future directions. Also speaking was long-time friend of CVB, Dr. Russ Mittermeier, as well as representatives of other conservation organisations in Madagascar. We were also honored with a video call from the interim Director General of Madagascar National Parks (MNP), as well as the Chair of the MNP Board of Trustees.

Amongst myriad meetings, one highlight was a dinner with the X Prize Foundation team and attended by Drs. Gillespie, Davalos, and Wright. This afforded the opportunity to speak with the director of the Smithsonian Tropical Research Institute (STRI), Dr. Joshua Tewks-

bury, as well as the head of CITES. Dr. Wright also attended a meeting organized by the Nature Conservancy of Canada with Dax Dasilva from Age of Union. We hope that Dax will visit Ranomafana next October. Team members also met with Dr. Alex Dehgan, CEO of Conservation X Labs, to discuss the potential use of his AI innovations in Ranomafana. Dr. Luis Fernandez of CINCIA at Wake Forest held an impromptu discussion on halting dangerous practices in Peruvian gold mining. We were delighted to witness the signing of '30 by 30' initiative to designate 30% of Earth's land and ocean area as protected areas by 2030, but this is only the start of the journey. On to COP16 in Turkey!

- By Dr. Patricia Wright & Michael Docherty



## Special Thanks to Kearney

Our CVB Board member, Wai Poc, kindly negotiated a generous donation from Kearney, a leading global management consulting firm. Kearney spent six months interviewing key players at CVB and other tropical research stations worldwide to produce the "CVB Strategic Plan from 2023–2033", which we presented at the COP15. We would especially like to thank Jerry Cacciotti and Cristhian Soto for their heartfelt input into this project. This is an important strategic document that guides our direction in conservation for the next decade.

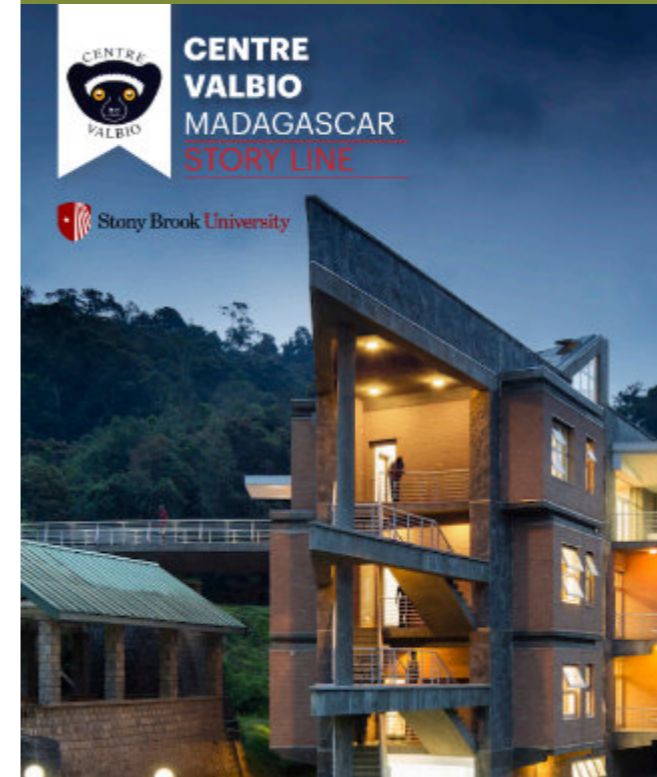


*Eulemur rubriventer*

## Centre ValBio Distinguished Guests

*Drs. Dianne and Greg Annunziata  
UK Ambassador David Ashley  
Chandreyee Banerjee  
Juliette Binoche  
Dorrett Elaine Lyttle Byrd  
Sean Callahan  
Eric Callendar  
The Della Pietra family  
Louise Ferguson  
Dr. Rachel and John Hart  
Dr. Robin Herrnstein  
Dr. Hayley Hesseln  
Carl Holborn*

*Vince Kasperick  
Greta Knapp  
Tara Lloyd  
Dr. Meg Lowman  
Marie-Monique Robin  
Elizabeth Moore  
Arlene and Glenn Paulowski  
Dr. Gerald Post and David Duchemin  
Laura Pohl  
Kay Redmond  
Dr. Edward Tronick  
Bishop Luis Zarama*





## *Making Pandemics*

We were honored to have French film star and Academy Award-winner Juliette Binoche (*The English Patient* and *Chocolat*) and award-winning director Monique-Marie Robin come to Centre ValBio in February to film their last scenes for the documentary film *La Fabrique des Pandémies* or *Making Pandemics*. The film, shot across eight countries and four continents, explores how global deforestation and biodiversity loss are driving increased rates of emerging zoonotic diseases. In the film, Binoche, who herself has long been an advocate for conservation and the environment, speaks with over 20 disease ecologists to get a sense of how deadly epidemics and pandemics arise from human activity.

True to Ranomafana's notorious February rainy season, it rained continuously as we filmed the Milne-Edwards sifakas in the forest. At the time, Cyclone Batsirai had just passed and Cyclone Emnati stormed through the night right after the filming. Later on, Juliette, Dr. Tom Gillespie (Emory University), and Dr. Patricia Wright joined over 200 villagers in planting native trees for the cameras.

In the summer of 2022, Dr. Tom Gillespie participated in the celebration of *Making Pandemics* during the International Workshop and Conference on the Ecology and Evolution of Infectious Disease at Emory University in Atlanta, Georgia, and the World Biodiversity Forum in Davos, Switzerland. The film's central message of the United Nation's "One

Health" concept—how the health of the environment is crucial to the health of humans—was an incredibly timely reminder, especially following the past two years of the COVID-19 pandemic.

To date, the film has been broadcast on 13 international television channels, and there have been more than 100 showings across theaters in French-speaking Europe. It has won ten international awards, including Best Documentary Feature in Shenzhen International Film Festival, the Public Award in Festival Lumexplore, and the Special Prize in Deauville Green Award 2022. In 2023, the film will also be shown at the Global Media Festival.

- By Dr. Patricia Wright



A FILM BY  
MARIE-MONIQUE ROBIN  
WITH  
JULIETTE BINOCHÉ  
MUSIC  
EMILY LOIZEAU





## Canadian Broadcasting Corporation

Louise Ferguson, the director of a new Canadian Broadcasting Company (CBC) series titled *Shared Planet*, arrived at CVB with her camera crew in December 2022. Each episode will focus on an inspirational conservation success story where both wildlife and the local people receive tangible benefits from conservation efforts. Ferguson chose Ranomafana National Park to film the "Forest" episode.

For the first week of filming, the film crew followed CVB's *Propithecus* team and the Tal-

atakey Group I Milne-Edwards' sifakas through the rainforest. This group had a six month old infant, but her father had disappeared in October. We followed the sifakas all day long and the footage was spectacular. However, no male appeared, even though the breeding season starts on Christmas Day.

During the second week, the CBC team filmed the Reforestation Team and the SPICES project. The vanilla plants growing successfully on the saplings were producing pods for drying and eventual sale. We are all looking forward to the release of the series, which may be aired in late 2023. The series, which is a joint production with German television broadcaster ZDF, will be distributed worldwide to a very large audience.



## MoU with University of Fianarantsoa

On November 12<sup>th</sup>, 2022, the University of Fianarantsoa and the Institute for the Conservation of Tropical Environments (ICTE) signed a new Memorandum of Understanding. At the workshop, attended by CVB's Executive Director Dr. Patricia Wright, National Director Pascal Rabeson, and Hasina Malalaharivony, CVB's Deputy Head of Research, different points regarding human resources, infrastructure, materials, and research and innovation were discussed. Through the exchange of researchers and staff, CVB and the University of Fianarantsoa have kept a long-standing relationship since 2003. Each year, students from



the Stony Brook University Fall Study Abroad program are invited to present their research on campus in front of fellow students and university faculty. Students from the University of Fianarantsoa also frequently take part in research and training programs held at CVB.

In early 2023, President of Stony Brook University Dr. Maurie McInnis, U.S. Ambassador to Madagascar Claire A. Pierangelo, and Dr. Patricia Wright met with University of Fianarantsoa President Dr. Hajalalaina Aimé Richard. During their visit, President McInnis and Ambassador Pierangelo met current faculty and toured the facilities. This was an exciting opportunity to further the international cooperation between the US Embassy, CVB, and two prominent research universities.

## Seneca Park Zoo Conservation Warrior

Renowned anthropologist and primatologist Dr. Patricia Wright—Professor at Stony Brook University and founder and executive director of Centre ValBio—has been named the inaugural recipient of the Conservation Warrior Award. Established by the Seneca Park Zoo in Monroe County, New York, and coordinated by the Seneca Park Zoo Society, the award was established to honor individuals whose innovation and commitment to conservation have led to lasting, meaningful impact on species survival. This award is also aimed at elevating awareness of the heroic work being undertaken around the world in partnership with the Seneca Park Zoo.

The physical award is a depiction of a tree growing out of rock, and was designed and created by artists at the Corning Museum of Glass. It embodies the resilience, strength and passion the recipient brings to preserving wildlife and wild places. The award also includes an unrestricted operating grant of \$20,000, made possible by Claudia and David Weber.

Rochester’s Monroe County Executive Adam Bello issued a proclamation naming December 7<sup>th</sup> of 2022 as Dr. Patricia Wright Day, in which he called upon “citizens to continue to take steps to advance conservation efforts here in our County and around the globe, and to honor and celebrate the incredible work and contributions of Dr. Patricia Wright.”

Seneca Park Zoo Superintendent Steve Lacy lauded the long-standing partnership Seneca Park Zoo has had with Dr. Wright and her work in Madagascar, noting there are few zoos with this kind of relationship of steadfast support over nearly three decades. In receiving the award, Dr. Wright expressed her gratitude for the Zoo’s involvement and support, spoke of the important role zoos play as ambassadors to nature, and called on everyone to join the crusade to save nature. “I’m so glad to be back and to accept this award from a place I really respect,” she said. “I am fighting a war, I’m fighting it all the time, but I’m not fighting it alone. I have an army of people to help me including you. I am proud to be your Conservation Warrior.”

*Courtesy of SBU News*



*Haplemur aureus*

## Smithsonian Cover

Dr. Patricia Wright and her successful conservation efforts at the Lost Forest of Ivohiboro were featured in Smithsonian Magazine’s July/August issue, 2022. “Into the Forbidden Forest: An American biologist’s pioneering research in a Madagascar wilderness,” written by journalist Dyan Machan described the four-day expedition undertaken in 2021 by Machan, Wright, Pascal Rabeson, photographer Noel Rowe, and a group of Malagasy scientists and research technicians.

The determined effort to conserve the Lost Forest, now known as the Ivohiboro Protected Area, began several years ago in 2016, after Dr. Wright and her team’s initial visits to this rain-

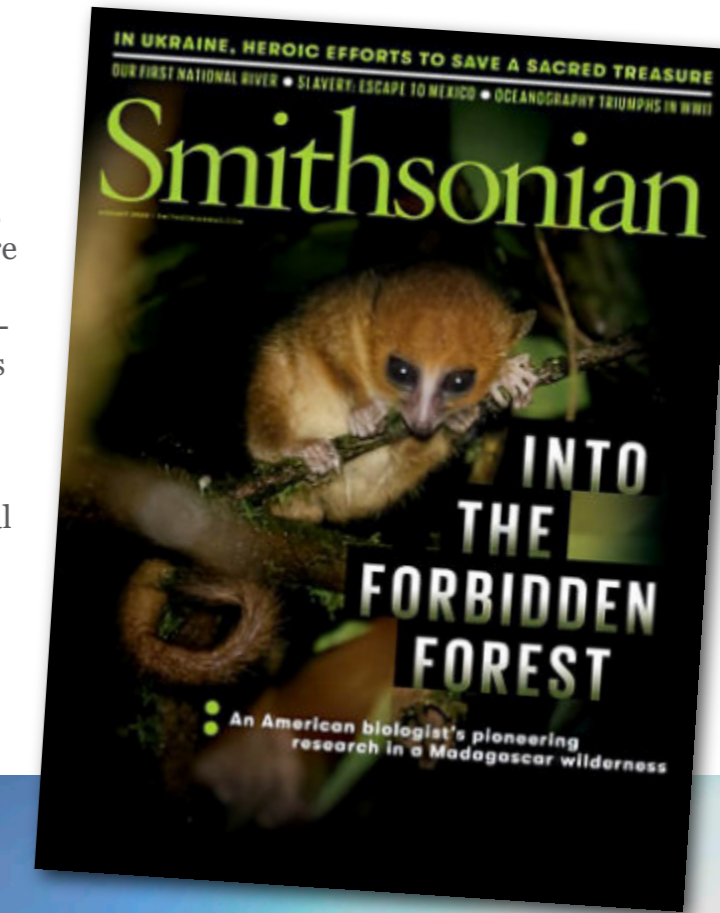
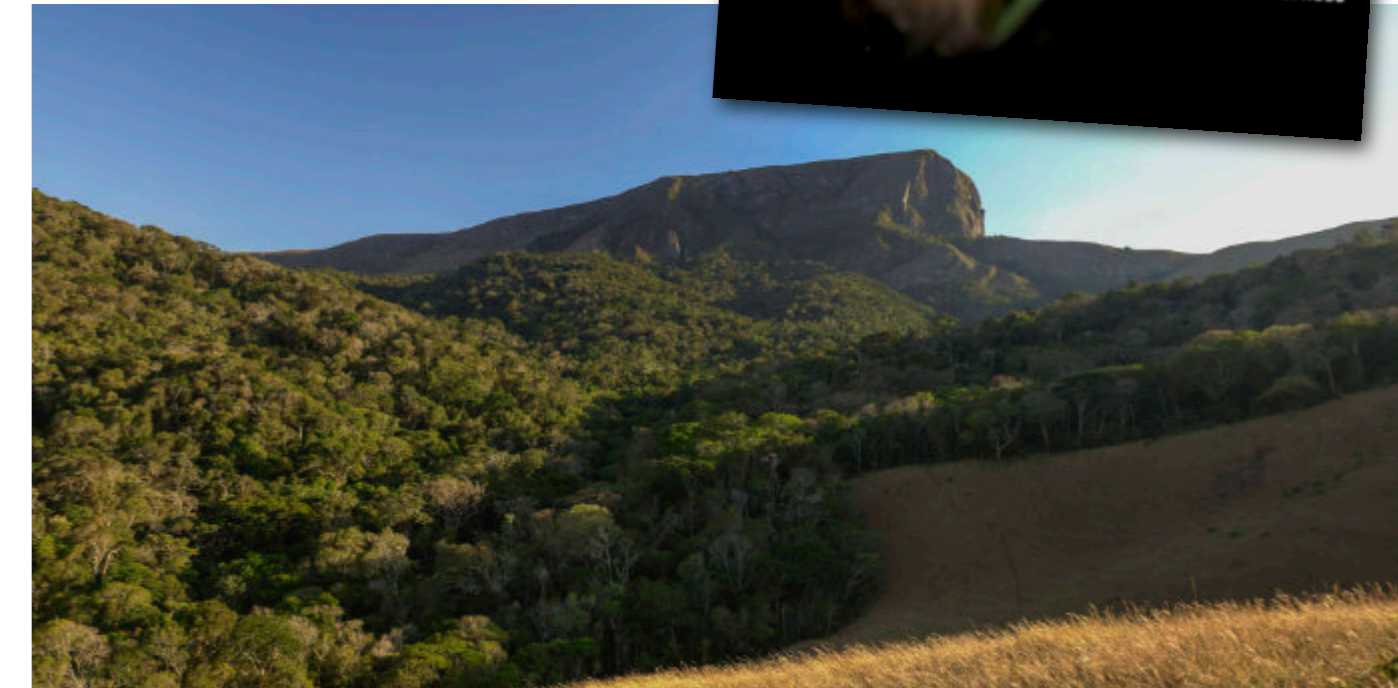


*Lemur catta*

forest in southern Madagascar revealed a plethora of unique never-before-seen species and fascinating habitats.

Working together with the local communities, Rainforest Trust, Phoenix Conservancy, Centre ValBio, and MICET have since developed Ivohiboro, as a 2,000 hectare Community Protected Area, trained community youth to serve as forest rangers, and inaugurated the new headquarters of the protected area. Now, in 2022, the forest is expanding due to natural seed dispersal and the diligent care of the local communities.

The article can be found here: <https://www.smithsonianmag.com/science-nature/into-forbidden-forest-madagascar-180980318/>



## Jonah Ratsimbazafy's Book Release

Internationally renowned primatologist Dr. Jonah Ratsimbazafy released his new book *C'est dans l'Obscurité que les Étoiles Scintillant*, or *It is in the Darkness that the Stars Shine*, on December 19<sup>th</sup>, 2022.

The book details Dr. Ratsimbazafy's journey from obstacles faced growing up to becoming President of the International Primatological Society and co-founder and President of the Madagascar Primate Study and Research Group (GERP), as well as his continued endeavors to conserve wildlife in their natural habitats.

As a past doctoral student of Dr. Wright's in the Department of Anthropology at Stony Brook University, Dr. Ratsimbazafy and CVB have remained closely connected since 1990. Most recently, Dr. Ratsimbazafy had the honor of having a new species of mouse lemur named after him—*Microcebus jonahi*— and two commemorative stamps created in his name for World Lemur Day in 2021.

While the book is currently only available in French, it will be translated into Malagasy and English in the near future.

Congratulations, Jonah!



*Eulemur fulvus*

## Workshops & Events

### E2M2 ►

In the first Ecological and Epidemiological Modeling (E2M2) workshop held since the COVID-19 pandemic, 30 students from the University of Antananarivo and Institut Pasteur de Madagascar visited CVB for an introduction to programming in RStudio and the use of dynamic models in understanding ecological and epidemiological data. From December 10<sup>th</sup> to 17<sup>th</sup>, the students participated in lectures, developed their own research questions, and presented the results of their statistical analyses. For some students beginning their PhD programs, this workshop was a valuable opportunity to develop their own research plans with support from instructors.



### CRS ►

Over the course of 2022, Catholic Relief Services (CRS) held numerous workshops at CVB, including a training with the University of Fianarantsoa and the University of Michigan on soil sample collection. Soil samples were taken throughout the southeast region of Madagascar and analyzed for their ability to sequester carbon for climate change mitigation. The last CRS workshop of the year was held between November 15<sup>th</sup> and November 18<sup>th</sup>, and was a chance for CVB's Reforestation Team and CRS to lay the groundwork for their annual Detailed Implementation Plan (DIP) for the coming fiscal year. Heads of each project discussed the progress and challenges of ongoing projects like SPICES and developed strategies to improve their success in 2023.



### ◀ Madagascar Soap Project

Between October 11<sup>th</sup> and October 12<sup>th</sup>, 12 leading soap makers from the commune of Evato attended a Madagascar Soap Project symposium at Centre ValBio. The training, carried out with technical and financial support from UNICEF and the Korea International Cooperation Agency, centered around sustainable soap making and creating WASH (Water, Sanitation, and Hygiene). These soap makers will be able to share their skills with their communities to improve their soap-making capacity using local ingredients, create a source of income through developing local soap-maker associations, and raise awareness on hygiene and sanitation. Overall, the project hopes to support 1,200 vulnerable households in remote areas where soap is difficult to obtain.



### ◀ World Lemur Day

On October 28, 2022, the CVB Environmental Education Team worked to organize a two-day celebration of World Lemur Day. Activities included a park visit for about 300 students and some adults from primary, secondary and high schools. The event was also celebrated with a talent contest, during which students from various schools showed poems, songs, dances, and theater performances related to lemurs and the environment. The Education Team also hosted an information booth about Ranoamafana National Park and showcased student artwork, while CVB's resident artist Alain Rasolo provided nature-themed face paint to children and adults alike. The second day of the celebration included a carnival around the town and speeches.



*Eulemur rufifrons*

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### Publications

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*Coua caerulea*

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*Heterixalus albo guttatus*

## Donors

We are extremely grateful and wish to acknowledge everyone who supported Centre ValBio's work this past year as we continued to navigate the uncertainties of COVID-19's lasting impacts. Your contributions were instrumental and enabled us to continue our endeavors in research, education, reforestation, and conservation.

We cannot thank you enough.



*Falco newtoni*

### \$50,000+

Kearney

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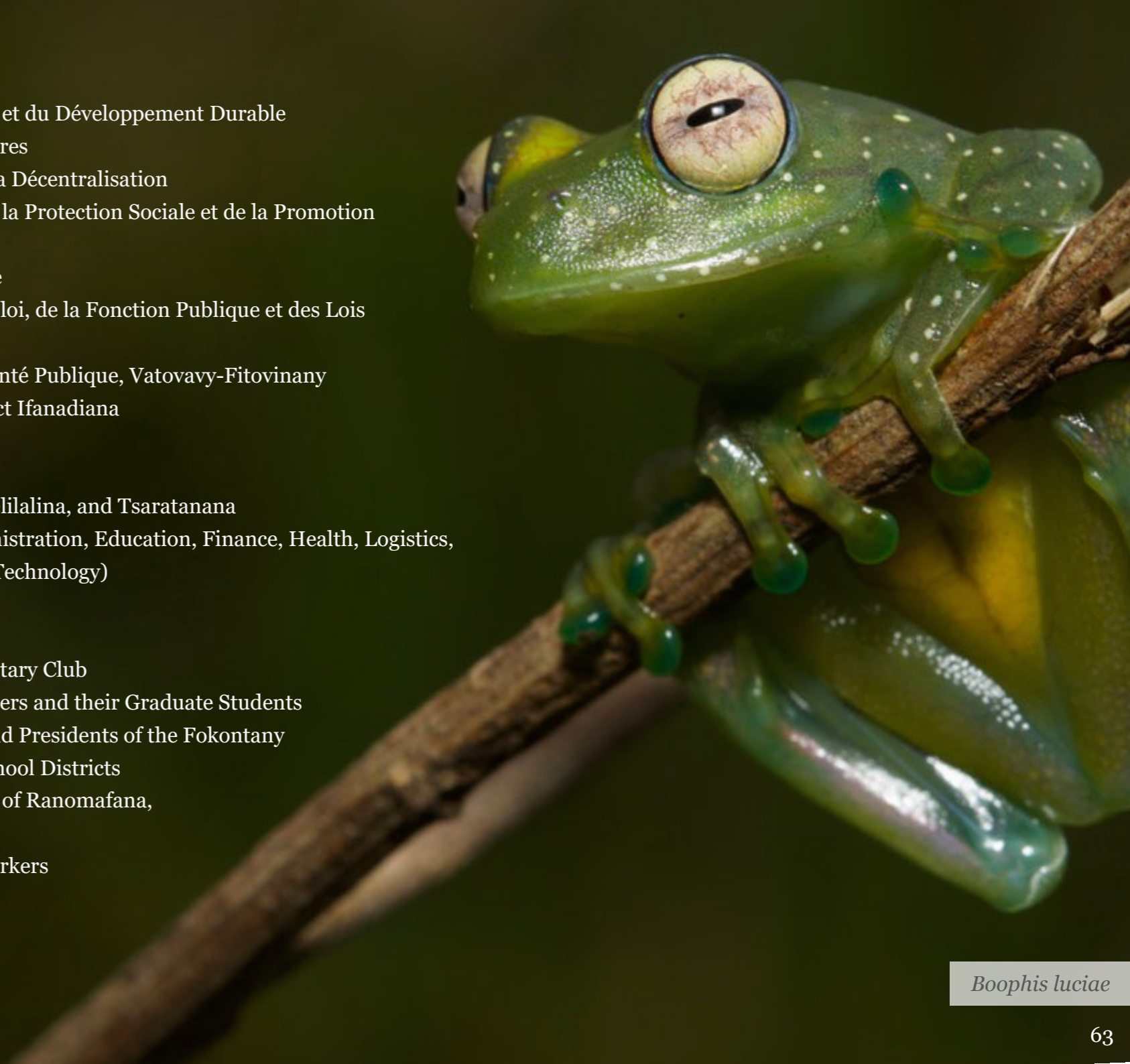
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## Acknowledgments

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- Le Médecin Inspecteur, District Ifanadiana
- Madagascar National Parks
- USAID
- Chefs CSB II, Ranomafana, Kelilalina, and Tsaratanana
- All Centre ValBio Staff (Administration, Education, Finance, Health, Logistics, Reforestation, Research, and Technology)
- MICET
- MSI Reproductive Choices
- Bergen Highlands/Ramsey Rotary Club
- All of our Long-term Researchers and their Graduate Students
- All the Kings of the Villages and Presidents of the Fokontany
- Ifanadiana and Lalangiana School Districts
- The Mayors of the Communes of Ranomafana, Kelilalina, and Tsaratanana
- All the Community Health Workers
- The CVB Board

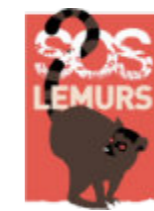
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*Boophis luciae*



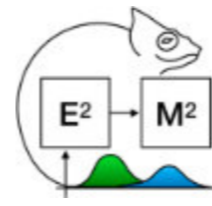
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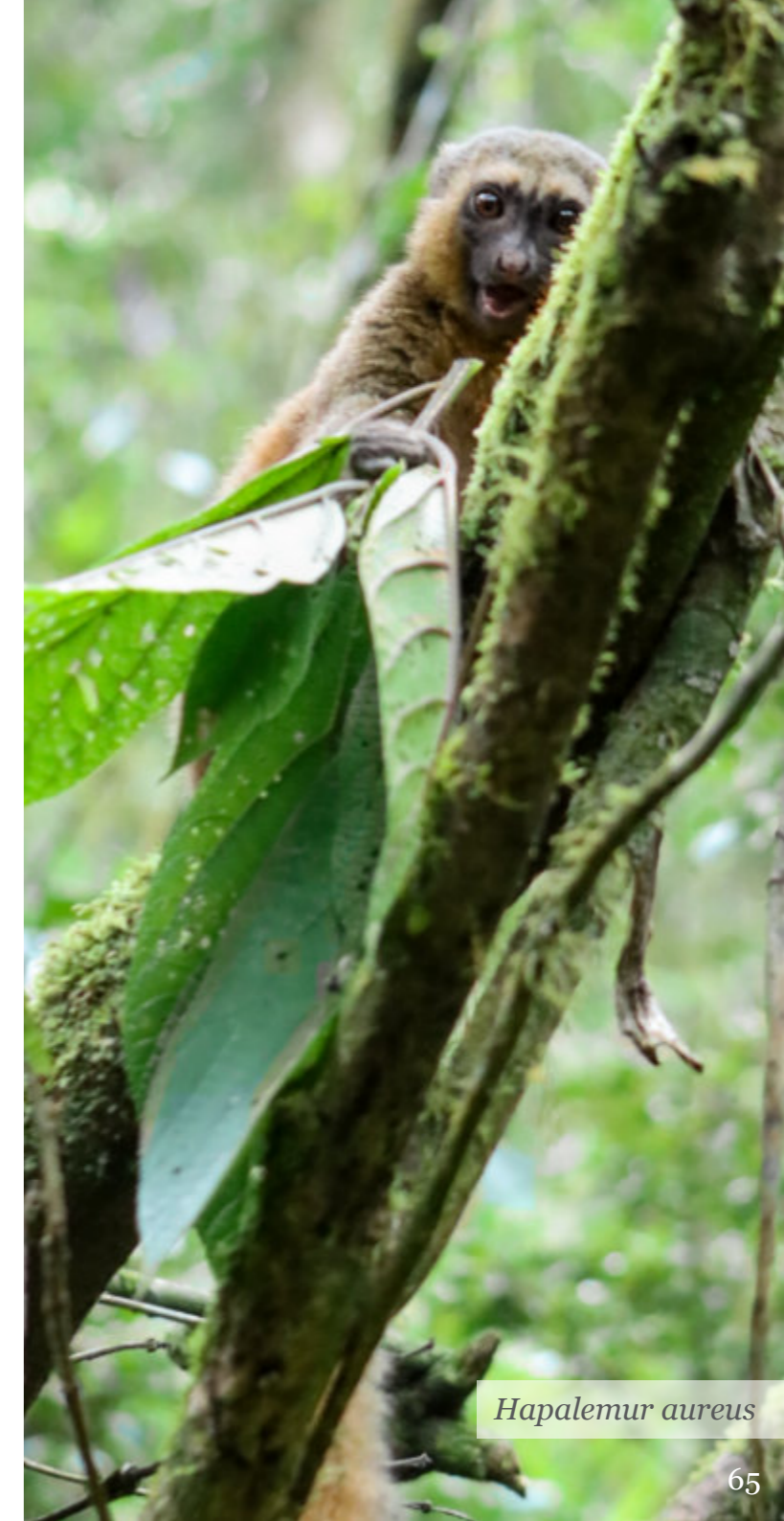


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