

# IMPACT REPORT

2020



## Center for Conservation in Madagascar

## Background Summary

The Center for Conservation in Madagascar is one of the original Centers of the Saint Louis Zoo WildCare Institute. The Center's primary goal is to reduce direct pressures on Madagascar's threatened and endangered species. To achieve this goal, the Saint Louis Zoo works through a consortium known as the Madagascar Fauna and Flora Group (MFG). The MFG was founded on the principle that uniting individual institutions under one umbrella significantly increases the contribution any one facility can make on its own. The MFG is an international non-governmental organization comprised of zoos, aquaria, universities and other conservation organizations. As a collective body, it works with Madagascar government authorities and in-country staff to achieve conservation action, research, capacity building and education efforts in eastern Madagascar.

The Saint Louis Zoo has assumed chairmanship of the MFG twice; first with Jeffrey P. Bonner, Ph.D., Dana Brown President & CEO, from 2003 to 2006, and second under Eric Miller, DVM, former Executive Director of the WildCare Institute, from 2006 to 2018. In May 2019, Eric retired and Lisa Kelley, Ph.D., became Executive Director of the WildCare Institute and Director of this Center. Lisa currently serves as Secretary on the MFG Board. Bob Merz, Assistant Director of the WildCare Institute, also is the Assistant Director of this Center.

## In-Country Location

The Center supports efforts at both of the Madagascar Fauna and Flora Group's primary conservation research sites, Parc Ivoloina and Betampona Natural Reserve. Both sites are located in Eastern Madagascar (Fig. 1).

- » Parc Ivoloina is a former forestry station that has been transformed into a 282-hectare conservation education, research and training center. Located just 30 minutes north of Tamatave, Parc Ivoloina also is home to a four-hectare zoo for native wildlife.
- » Designated as a reserve in 1927, Betampona Natural Reserve is Madagascar's oldest protected area. It is a 2,228-hectare rainforest fragment that contains high

levels of plant and animal diversity. MFG's continual research presence has protected Betampona from large-scale habitat loss and degradation despite the fact that it is surrounded on all sides by village activity.



Figure 1. Primary locations of MFG presence in Madagascar. Image accessed from [madagascarfaunaflora.org/where-is-the-mfg.html](http://madagascarfaunaflora.org/where-is-the-mfg.html)



A drone photo taken from Betampona shows the proximity of habitation and cultivation to the rainforest and the connectedness of those different elements. Photo courtesy of Dr. Fidy Rasambainarivo.

## Theory of Change

The Center's goal to reduce direct pressures on Madagascar's threatened and endangered species is approached primarily through the four objectives of the Madagascar Fauna and Flora Group. These objectives are:

- 1) conservation action to reduce or remove direct threats and maintain or build viable habitat
- 2) building in-country research capacity, leadership and/or management
- 3) conducting research that informs conservation management needs and/or methods
- 4) community development with a focus on both local communities and local and national authorities.

Another objective, specific to the Center, is acquisition of outside funding.

## 2020 Major Accolades and Accomplishments

- » Karen Freeman, Ph.D., was promoted to Executive Director of the MFG. Karen has been with the MFG since 2004, first as the MFG’s Program Director, and second as the MFG’s Research Director. The Center has provided salary support for her work since 2007.
- » International Union for Conservation of Nature (IUCN) motion #116—proposed and sponsored by the MFG, Synchronicity Earth, the Saint Louis Zoo, and a number of Malagasy and international partners—was approved with a remarkable 99% acceptance rate from non-governmental organizations. The motion is to help build capacity in Madagascar in order to tackle invasive species. This will be extremely valuable to have the IUCN’s backing for future fundraising efforts. It will also allow us to directly engage the IUCN’s extensive legal expertise to help Madagascar develop stricter legislation to protect the island and its incredibly unique and highly threatened biodiversity from further invasions of invasive species.

## Center Impact

Through his role as Saint Louis Zoo Affiliate Scientist, Fidisoa (Fidy) Rasambainarivo, DVM, Ph.D., spends three-fourths of his time working on mutually agreed-upon, high-priority projects of the Madagascar Fauna and Flora Group and the Zoo. Here we highlight the key results for two of these projects.

### Project 1: Genetic Management Project of the Diademed Sifaka

*Research that informs conservation management needs/ methods*

*Building in-country research capacity, leadership and/or management*

The WildCare Institute is collaborating with its partners in Madagascar (Madagascar Fauna & Flora Group and the Madagascar National Parks) to plan and conduct a translocation project of the critically endangered diademed sifaka (*Propithecus diadema*) into the Betampona Natural Reserve.

Since late 2018, MFG team members and Fidy organized several missions to capture and collar the existing groups of a critically endangered lemur, the diademed sifaka, in this isolated protected area. In 2020, the team studied five groups of diademed sifaka, despite a short interruption due to the pandemic. This research and the monitoring of the lemurs have produced valuable insights into the ranging behavior of the species, their demographics and health – all critical in preparation for the translocation project.

Closely following collared individuals has also helped deter hunters from poaching as reports from Betampona



Diademed sifakas (*Propithecus diadema*), one of the main study species of our Betampona efforts and target of the translocation project. Photo courtesy of Dr. Fidy Rasambainarivo.

and other protected areas indicate that hunting offenses are increasing in Madagascar and particularly since the beginning of the pandemic. Many villagers have lost their source of income as prices of essential commodities are rising, pushing many to hunting lemurs and other wildlife.

In addition, the research has allowed the team to witness, document and interpret events that have gone unnoticed in the past. For example, Savien, a student from the University of Toamasina, saw the formation of a new group as the single male that he was following joined a pair of females in the western part of the reserve. In the meantime, preparation for the translocation are ongoing. The permit application process is making progress through the authorities, and the team is hoping for a 2022 translocation.

## Project 2: Newcastle Vaccination Poultry Project

*Conservation action to reduce or remove direct threats and maintain or build viable habitat*

*Building in-country research capacity, leadership and/or management*

In rural parts of Madagascar, wild animals are consumed by villagers out of necessity, in order to complement their diet with animal protein. Although chicken meat is preferred and backyard poultry farming is prevalent, an important vulnerability associated with poultry

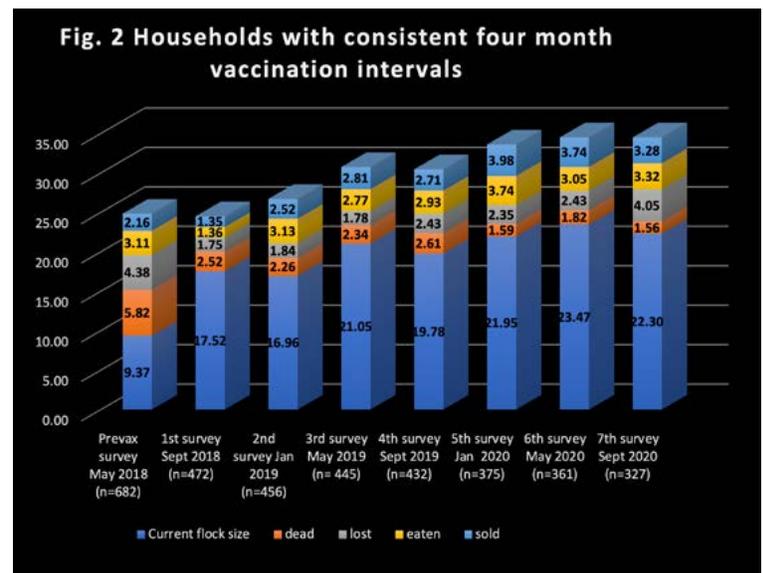
farming is the array of pathogens to which the species is susceptible. Newcastle disease is one such disease affecting chickens in Madagascar and causing outbreaks with mortality rates above 70% in unvaccinated flocks.

In 2018, Madagascar Fauna and Flora Group initiated a three-year project in which free vaccinations against Newcastle disease were provided for chickens in 12 villages around the Betampona Natural Reserve (covering almost 700 households). The goal of this project has been to protect poultry from this devastating pathogen and improve villagers' livelihoods, thereby reducing the pressure on wild animals in the forest. In addition, the team has collected and analyzed census data to monitor flock demographics, including a breakdown of the number of chickens that have died, disappeared, were sold, or consumed in each household.

Information from these surveys paint a clear picture of its impact on rural livelihood near the protected area. Before the Newcastle disease vaccination program began, only 11% of the households in the region owned more than 20 chickens. To date, after seven vaccination campaigns (28 months), approximately half of the households in the villages now own more than 20 chickens. In fact, after the seventh campaigns each household owns on average 13 more chickens than they did at the beginning of the project (Fig 2).



Chicken vaccination during one of the campaigns. Photo courtesy of Dr. Fidy Rasambainarivo.



## Presentations and Publications Produced in 2020

With the COVID-19 pandemic bringing travel to a halt, the Center participated in two Saint Louis Zoo-sponsored virtual events. The first event was the summer WildCare Happy Hour series, featuring Fidy's research on the Newcastle Chicken Vaccination Project. This event also included an introduction from Lisa, who provided a brief background on her past research on lemurs in Madagascar, which included an early collaboration with Fidy at her site. The moderator of this event was Mike Poletti, who is the Zoo Young Professionals (a Saint Louis Zoo membership group for those in their 20s and 30s) liaison to the Zoo's Conservation Council. This presentation can be accessed at [stlzoo.org/happyhours](http://stlzoo.org/happyhours).



Fossa, Madagascar's largest carnivore, in Betampona Natural Reserve.



Opening slide of presentation for the WildCare Happy Hour series, featuring Madagascar.

The second Zoo-sponsored presentation was a presentation for Zoo donors that featured nine pre-recorded field stories from our partners throughout the continent of Africa titled, "Stories from the Field, Africa Edition." Karen submitted a story about her first observations of the elusive mating behaviors of fossa, Madagascar's largest carnivore, while looking for her son's lost toy sheep while on a picnic with her family in Betampona.

Fidy attended the live Q&A session and spoke about the training opportunities for Malagasy researchers and wildlife veterinarians at his lab, Mahaliana.



Stories from the Field: Africa Edition  
Unlisted

Screenshot of Q&A session at the end of the WildCare Happy Hour. From top left to bottom right: Dr. Lisa Kelley (WildCare Institute), Dr. Dave Morgan (Goulougo Triangle Ape Project, Congo), Sheila Funnel (Grevy's Zebra Trust, Kenya), Dr. Fidy Rasambainarivo (Mahaliana, Madagascar), Brenda Low Mackey (Grevy's Zebra Trust, Kenya) and Julius Lekenit (Grevy's Zebra Trust, Kenya).

## Other Virtual Presentations

- » BES British Ecology Live Series: “Microbial Sharing Network among Madagascar’s Carnivores.” Sponsored by the British Ecological Society. Given by Dr. Fidy Rasambainarivo. Accessible on YouTube.
- » Yale University Primate Conservation: “One Health and primate conservation.” Given by Dr. Fidy Rasambainarivo and sponsored by Dr David Watts (Yale University).
- » Voice of Vanilla: Virtual Conference: “Efforts to build scientific capacity for the conservation of Madagascar’s endemic fauna.” Given by Dr. Fidy Rasambainarivo and sponsored by film-maker Maureen Maloney.

## 2020 Publications

Below are published results from projects that were sponsored, in part, through Center funding (funded either through the WildCare Institute or one of its grants programs).

- » Blanco, M.B., Greene, L.K., Rasambainarivo, F., Toomey, E., Williams, R.C., Andrianandrasana, L., Larsen, P.A., Yoder, A.D. 2020. Next-generation technologies applied to age-old challenges in Madagascar. *Conservation Genetics* 21(5): 785-793.
- » DeSisto, C.M.M., Park, D.S., Davis, C.C. et al. 2020. An invasive species spread by threatened diurnal lemurs impacts rainforest structure in Madagascar. *Biological Invasions*. <https://doi.org/10.1007/s10530-020-02293-7>
- » Dubos, N., Morel, L., Crottini, A., Freeman, K., Honoré, J., Lava, H., Noël, J., Porton, I., Rendriendry, G., Rosa, G.M., Andreone, F. 2020. High interannual variability of a climate-driven amphibian community in a seasonal rainforest. *Biodiversity Conservation* 29, 893–912, <https://doi.org/10.1007/s10531-019-01916-3>
- » Glaw, F., Scherz, M.D., Rakotoarison, A., Crottini, A., Raselimanana, A.P., Andreone, F., Köhler, J.,

- » Vences, M. 2020. Genetic variability and partial integrative revision of *Platypelis* frogs (Microhylidae) with red flash marks from eastern Madagascar. *Vertebrate Zoology* 70(2): 141–156. ISSN 1864-5755 | eISSN 2625-8498 | DOI: 10.26049/VZ70-2-2020-04.
- » Lam, B., Noël, J., Crottini, A., Andreone, F., Rosa, G. M., 2020. Report of agonistic interaction in Malagasy frogs of the genus *Gephyromantis* (Anura, Mantellidae). *Arxius de Miscel·lània Zoològica*, 18: 27–32, Doi: <https://doi.org/10.32800/amz.2020.18.0027>
- » Licata, F., Andreone, F., Freeman, K., Rabesihanaka, S., Robsomanitrdrasana E., Reardon, J.T., Crottini, A. 2020. The Asian Toad (*Duttaphrynus melanostictus*) in Madagascar: A Report of an Ongoing Invasion. F. M. Angelici, L. Rossi (eds.), *Problematic Wildlife II*, p 617-638. [https://doi.org/10.1007/978-3-030-42335-3\\_21](https://doi.org/10.1007/978-3-030-42335-3_21)

## Stories from the Field

### An update from Fidy on Mahaliana

The WildCare Institute supports Dr. Fidisoa Rasambainarivo (Fidy) and his newly established laboratory and research center in Madagascar called Mahaliana Labs. Mahaliana is designed to provide the space, tools and mentorship for local Malagasy students to explore scientific questions related to biodiversity conservation in Madagascar. The lab was making great progress in building capacity after its first year of existence. But just like the rest of the world, Madagascar was not spared by the pandemic and declared its first case of COVID-19 in late March 2020. Soon after, in an effort to contain the disease, authorities closed borders and limited travel both from abroad to Madagascar but also nationally between regions, effectively putting a hiatus on several research projects. While authorities tried to manage the crisis as well as they could, the many unknowns on the spread of the disease around the world and its progression in Madagascar, in particular, has left many Malagasy needing data to make informed decision to protect their health and their loved ones.

The apparent void of research and information on several aspects of the outbreak in Madagascar motivated Fidy, his student and colleagues at Mahaliana to use their epidemiological skills to communicate the evolution of the epidemic in Madagascar and assess its potential burden on the population. The team built a dashboard (covid19mg.org) to collect and summarize the data provided by health authorities in an informative graphical manner. This dashboard is available in three languages (English, French and Malagasy) and is visited by hundreds of people weekly, providing statistics, epidemiological analysis and trending patterns of diseases that can help the public evaluate the risks of COVID-19 in the community. The dashboard has become an indispensable resource in the country and is frequently referenced in internal reports of national and international health agencies such as Unicef and the Ministry of Health as well as conservation organizations (WWF, Durrell).

While Mahaliana was initially built to help students and scientists find answers to the pressing problems facing biodiversity, thanks to the continued support of the WildCare Institute, we could step up in a time of crisis and provide a much-needed resource to the wider community, hoping for a return to normalcy and resume our work to help save Madagascar's endemic species.

## 2020 Center Budget Allocation

In 2020, the Center budget was reduced from \$115,000 to \$93,000 due to COVID-19-related budget cuts. The budget covered membership dues and salaries for Karen, Fidy, Juliana and wildlife conservation research.

Also in 2020, the two internal grant programs of the WildCare Institute, the Field Conservation grant program and the Field Research for Conservation grant program, were also part of the budget cuts. These two grant programs funded an additional \$13,557 to the Madagascar Fauna and Flora Group in 2019. In addition, 2019 was the final year of the \$30,000 donation from the anonymous donor. In consequence, there was a \$65,557 decrease in funding for the MFG between 2019 and 2020.

## Plans for the Future

The Center's three-year plan includes:

1. *A continued focus on the genetic management study of Betampona's diademed sifaka and black and white ruffed lemur population, with the objective to integrate this study within the larger Living Earth Collaborative project.*

Fidy and his team were on target with goals to collect genetic, health, demographic and home range data on diademed sifakas in 2019. In 2021, they will continue to collar and collect samples from additional diademed sifakas. Travel restrictions due to the pandemic, however, have delayed the team's ability to collect similar data on black and white ruffed lemurs. Data collection for that species likely will not occur until 2022. Our Washington University collaborators have hired a highly qualified post-doc to conduct the comparative lemur studies in Betampona and Vohibe, but the border to Madagascar remains closed, and the U.S. Department of State continues to issue Madagascar as a Level 4 Travel advisory. As an alternative, she will be initiating her post-doc with perfecting lab methodologies on the campus of Washington University. In 2021, the PIs at Washington University will seek four Malagasy doctoral students to conduct the needed field research.

2. *Continuation of the Newcastle disease chicken vaccination program.*

This project's fundamental goal is to protect Betampona's lemur species by decreasing the nutritional and economic drivers of bushmeat hunting. Further research is ongoing to assess the impact of this project on hunting rates and bushmeat consumption patterns near Betampona.

### 3. *Addressing invasive species issues.*

Karen will continue to oversee several key invasive species management issues for Madagascar Fauna and Flora Group. These include:

- » the rollout of the Asian toad control and mitigation program in areas of high biodiversity in the Atsinanana region of eastern Madagascar
- » the eradication of the house crow from Madagascar
- » the removal of invasive plants from 10 hectares within Betampona, which will then be replanted with native trees
- » the setting up of a community-based invasive species surveillance and reporting network around the major port town of Toamasina, and
- » working with the Ministry of the Environment and Sustainable Development In Madagascar to uphold the IUCN's 2020 resolution #100 to increase capacity for invasive species management in Madagascar.