



# *Annual Report 2013*





*Our Mission : to conserve biodiversity  
in eastern Madagascar*

**United States of America:** Dr. Eric Miller, MFG Chair & Ingrid Porton, MFG Vice-Chair  
**Madagascar:** Maya Moore, Program Manager | **United Kingdom:** Dr. Karen Freeman, Research Director

***Impressum:***

Madagascar Fauna and Flora Group / Parc Ivoloina  
BP: 442 (en face Hopital Manara-penitra) Morafeno, Toamasina (501)  
Tel. Bureau: 020 53 30842, Tel. mobile: (261)320510307, Email: mfgmad@moov.mg

**MFG c/o Saint Louis Zoo**  
1 Government Drive, St. Louis MO 63110 USA  
*Annual Report, All rights reserved.*



## *Content*

## *Page*

Abbreviations	1
Editorial	2
Who is MFG?	3
Where does MFG work?	3
MFG's activities and main 2013 achievements	7
 Conservation Action	7
 Conservation Research	11
 Environmental Education	14
 Capacity Building	18
Prosimian Congress & MFG's 25 <sup>th</sup> Anniversary	21
Financial Summary	22
Looking ahead to 2014	23
How to get involved?	24
MFG's Team	24
Thanks to the members and donors of MFG	24

## Abbreviations

ADEFA	<i>Association de Défense de la Forêt d'Ambodiriana</i>
CCYBC	Connecting Classrooms and Youth for Biodiversity Conservation
CEPE	<i>Certificat d'Etudes Primaires Elémentaires</i>
CIBIO	<i>Centro de Investigação em Biodiversidade e Recursos Genéticos</i>
DEA	<i>Diplôme d'Etudes Approfondies</i> (post graduate diploma)
DESMV	<i>Département d'Enseignement des Sciences et de la Médecine Vétérinaire d'Antananarivo</i>
DICE	Durrell Institute of Conservation and Ecology
DWCT	Durrell Wildlife Conservation Trust
EEC	Environmental Education Center
EPP	<i>Ecole Primaire Publique</i> (public primary school)
GRENE	<i>Gestion des Ressources Naturelles et Environnementales</i> (natural resource management university)
ICTC	Ivoina Conservation Training Center
IPC	International Prosimian Congress
ISSEDD	<i>Institut Supérieur des Sciences Environnemental et Développement Durable</i>
GIS	Geographic Information System
JRC	Junior Reporters Club
MEF	<i>Ministère de l'Environnement et des Forêts</i> (Ministry of Environment and Forests)
MBG	Missouri Botanical Garden
MFG	Madagascar Fauna & Flora Group
MNP	Madagascar National Parks
MYNE	Malagasy Youth Network for the Environment
REPC	<i>Réseau des Educateurs Professionnels de la Conservation</i> (network of professional conservation educators)
RNI	<i>Réserve Naturelle Intégrale</i> (strict nature reserve)
SRI	System of Rice Intensification
UIZA	<i>Unione Italiana degli Zoo e degli Acquari</i>
VAM	Vesicular Arbuscular Mychorrizhae
WED	World Environment Day
ZAP	<i>Zone d'Action Pédagogique</i> (school district supervision)



## *Dear friends and members of the MFG,*

The year 2013 was an eventful one for the Madagascar Fauna and Flora Group (MFG), packed with important benchmarks and new initiatives. We celebrated our 25th Anniversary of working to halt the extinction of Malagasy species and even got a new name. As of April 2013, the “Madagascar Fauna Group” became officially known as the “Madagascar Fauna and Flora Group” (the acronym remains the same) to more accurately reflect MFG’s work in both animal and plant conservation.

MFG also got a fresh look with a logo designed by graphic design artist Jana Grabner. Even Parc Ivoloïna got a facelift, with a new park office, a renovated playground, updated signage at the entrance to the park and zoo, and a color pocket guide to better orient park visitors.

As always, we accomplished a spectacular amount of work on the ground. At the zoo, we completed

construction of the Amphibian Conservation Center, only the second in the country. We also welcomed the birth of our second *Prolemur simus* in two years. MFG even attended and presented at the International Prosimian Congress held at Centre ValBio, Ranomafana, as well as contributed to the Betampona section of the Lemur Action Plan (2013 – 2016).

From the production of a twenty-minute film about MFG’s work over the last twenty-five years to the launch of MFG’s new weekly radio program, *Bitsik’ny Ala Atsinanana*, and the start of a MFG Facebook page, we got the word out about the important conservation work that MFG is doing.

On the member front, MFG welcomed its first member from the African continent, Cango Wildlife Ranch, in South Africa. We also had renewed commitment from over 20 member institutions.

2013 was also an election year in Madagascar. Thus far, we are pleased to report that the transition has gone smoothly and we remain optimistic that international aid organizations will soon return to the island (as well as cruise ships!).

We look forward to the year ahead, and while there will certainly be many challenges, of which amphibian conservation will most likely be prominent, we are ready to tackle these conservation obstacles head on with the continued support of our members and donors.

Sincerely yours,

Maya Moore



MFG Program Manager





## Who is MFG?

An international consortium of over 20 zoos, botanical gardens, universities and related institutions, the Madagascar Fauna and Flora Group (MFG), founded in 1988, is a non-profit organization operating in the Toamasina vicinity in eastern Madagascar, while the Chair of the Board currently sits at the Saint Louis Zoo in Missouri, USA.

MFG is committed to conserving Malagasy biodiversity, with particular focus on lemurs and other endangered plants and animals which are endemic to Madagascar's eastern rainforests.

MFG's programs respond to the second and third objectives laid out in the Madagascar Action Plan (2007-2012): protecting environment, reducing the degradation process of natural resources, and developing environmental awareness at all levels. They contribute to fulfill the seventh objective of the Millennium Development Goals set out by the United Nations "to ensure environmental sustainability".

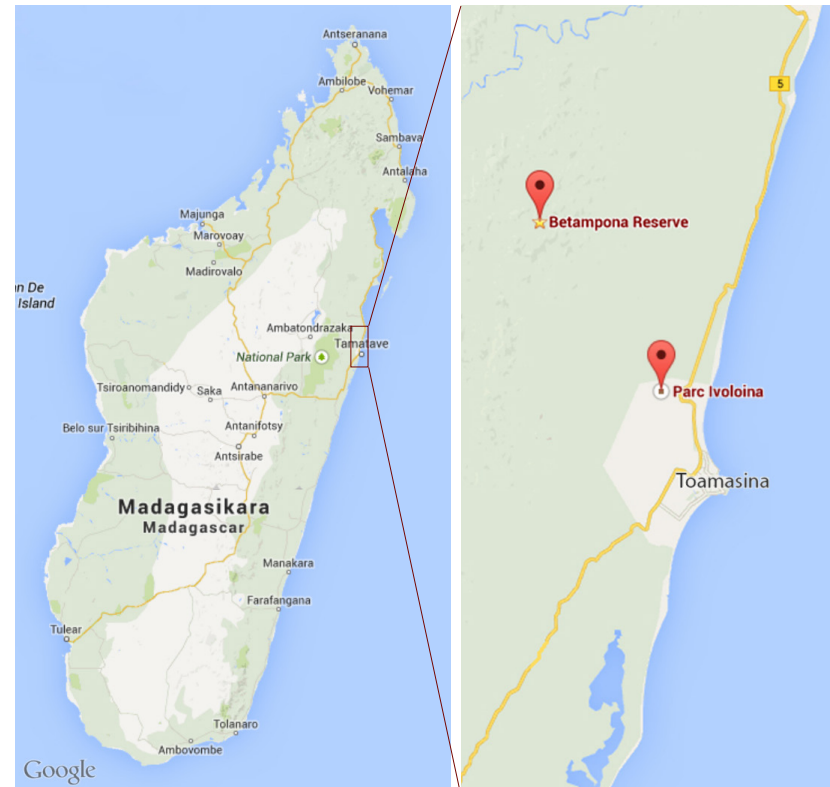
## Where does MFG work?

MFG carries out its conservation activities at two sites in the Toamasina area.

Parc Ivoloïna is a regional center for conservation efforts which focuses on activities such as providing environmental education for children and promoting sustainable agricultural practices to local area farmers.



Betampona is a strict nature reserve and also the site of the first (and only) reintroduction of captive born lemurs back into the wild. The reintroduction has evolved into an important program of conservation research and ecological monitoring.







## *Parc Ivoloina and Forestry Station*

*(282 hectares): 31 full-time staff*

Parc Ivoloina is composed of:

- **Zoo** (4 ha) for the conservation and breeding of endangered animal species as well as safe haven for confiscated endemic endangered animals such as lemurs and tortoises.
- **Environmental Education Center (EEC)** to raise awareness on environmental issues facing Madagascar, with a target audience comprised of park visitors and Malagasy school groups.
- **Forestry Station** with a tree nursery, where reforestation projects and an endangered plant propagation program are implemented.
- **Model Agroforestry Station** for vocational training of local farmers in the use of sustainable agricultural techniques. Fruit and vegetable production also contributes to feeding the animals at the zoo.
- **Ivoloina Conservation Training Center (ICTC)** was constructed in direct response to a

vision articulated by Toamasina's community leaders, and includes a large meeting room, working laboratory, dining hall and dormitory. Conferences, trainings and workshops are held there.

- «Buvette» is a small visitor welcome center with a restaurant and eco-gift shop situated on Lac Fulgence.

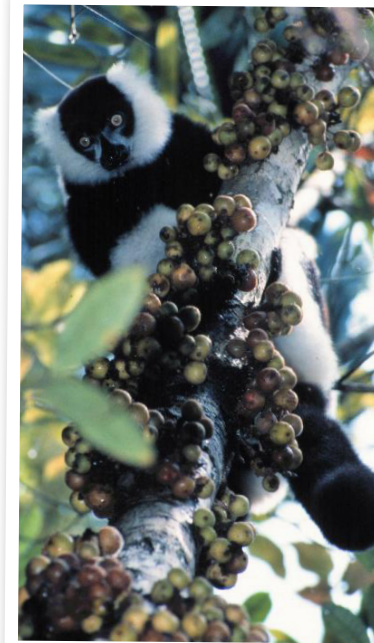
In 2013, 16,353 people had guided and self-directed tours of the zoo, 6,980 visited the Environmental Education Center, 651 went to the Model Agroforestry Station, and 779 used the lab facility.



## *Betampona Natural Reserve (2228 ha) and Rendrirendry Research Station: 16 full-time staff + 6 guides*

Betampona is situated approximately 40 km northwest of the city Toamasina. Recognized today as one of Madagascar's top biodiversity hotspots, it became the first area to receive the designation "Réserve Naturelle Intégrale" (RNI) or "Strict Nature Reserve" in 1927. At that time, Betampona was part of a much larger fragment of rainforest. Ranging from 250 to 600 meters in altitude, Betampona now stands alone amidst a sea of cultivated land – one of Madagascar's last remaining lowland rainforests.

Betampona's designation means that access is restricted to Madagascar National Parks (MNP) and approved researchers. MFG is the main research organization working at Betampona and is MNP's official partner for the management of the site. Within the reserve, MFG is carrying out research to increase knowledge of the species present and their distribution to try to establish the conservation status of each. Conservation management measures can then be taken to protect critically endangered species. In 2013, 43 researchers and teachers visited the reserve.



## *MFG's office in Toamasina: 4 full-time staff*



The Office contains our conservation library. This library has more than 1,000 books ranging from species identification guides and teaching references, to texts on ecology, ecoagriculture, soil science, animal behavior, geography and more. Most of the books are in English. However, there are a good number of French and Malagasy texts as well. Library visitation has increased regularly as more people, especially students from the *Institut Supérieur des Sciences Environnemental et Développement Durable* (ISSEDD), become aware of this valuable resource.

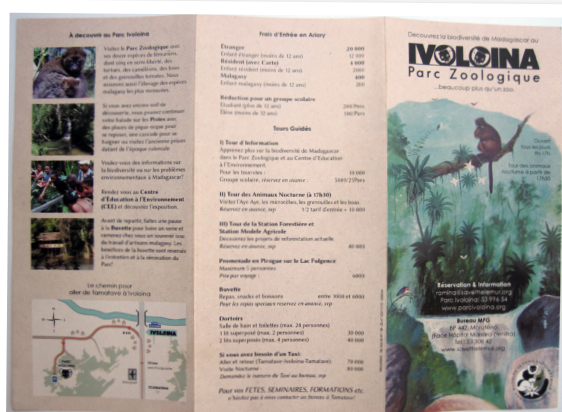
In 2013, the library had 150 visitors, 72% of which were ISSEDD students. Preferred research topics included agroforestry, Malagasy flora and fish farming.





This year we decided to upgrade our print publicity and map for Parc Ivoloina. Alain Rasolomampandra and Jana Grabner were the creative team which redesigned our informative brochure and the map of the Park.

The map was also printed on a large aluminum sign which hangs at the park to orient visitors.





## MFG's activities and main achievements in 2013

For 25 years, MFG has applied a holistic, multidisciplinary and integrated approach to achieve its four main goals toward conserving biodiversity in Madagascar: Conservation Action, Conservation Research, Environmental Education and Capacity Building of local partners.



## CONSERVATION ACTION: to protect Malagasy biodiversity

The Conservation Action program consists of *ex situ* species conservation as well as protection of native habitat. At Parc Ivoloina, we have breeding programs for endangered lemur and frog species, as well as an *ex situ* conservation program for endemic plant species. We also carry out forest restoration efforts around Betampona and within the Ivoloina Forestry Station. In order to ensure the protection of these habitats and to limit negative environmental impacts, we also conduct patrols in the reserve and forestry station.

In 2013, we bred two species of endangered lemurs (*Eulemur flavifrons*, *Prolemur simus*), and raised two species of frogs (*Dyscophus antongilii*, *Heterixalus madagascariensis*).

The number of species (19) under care and/or careful assessment of weight, health and reproduction evolution increased in 2013.

In 2013, our collection of animals in Ivoloina was stable and included:

- Lemurs: 12 species (3 nocturnal): 125 individuals, with more than 48 free-ranging lemurs. We had three births from two species.

*Prolemur simus*: one birth!

*Eulemur albifrons*: 2 births in the free-ranging population

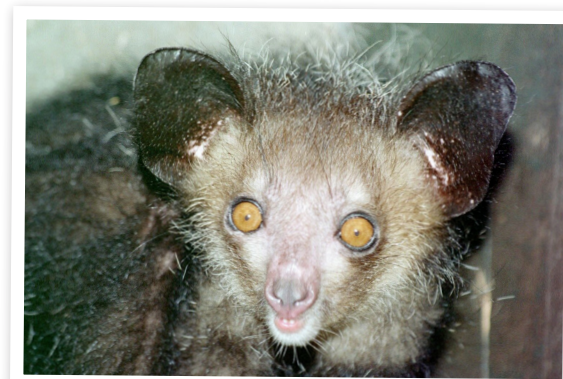
- Frogs: 2 species, 48 individuals (+40/2012)

*Dyscophus antongilii* (Tomato frogs): 8 individuals, no reproduction to date

*Heterixalus madagascariensis*: 40 individuals

- Snakes: 1 species, 2 individuals
- Birds: 1 species, 1 individual
- Tortoises: 2 species, 56 individuals (+6/2012)
- Chameleons: 1 species, 4 individuals









## Amphibian breeding facility

We completed construction of our Amphibian Conservation Center, a small building to house endemic amphibians, as well as to rear live insects for food, on Parc Ivoloïna's "off-exhibit" grounds.

While thirty-four species of amphibians have been inventoried at the park to date, we initiated our breeding program with just one species which is found in abundance and easy to raise: *Heterixalus madagascariensis*. In the future we plan to expand our conservation efforts to include endangered frog species.

The development of this captive breeding facility, the second in Madagascar, was made possible thanks to a grant from Durrell Wildlife Conservation Trust (DWCT) and continued support from the *Unione Italiana degli Zoo e degli Acquari* (UIZA) and allows MFG to play a major role in *ex situ* conservation of threatened amphibian species.



## Patrolling

Our patrol teams worked on rotation and collected GPS points, detailed observations and photos of infractions. In 2013, 50 patrols took place (25 in Betampona and 25 in Ivoloïna) and 44 "crimes" (34 in Betampona and 10 in Ivoloïna, ranging from lemur traps to ravinala leaves taken) were recorded (numbers have been decreasing every year since 2009). New in 2013, a nocturnal patrol was implemented quarterly in Ivoloïna.

## Reforestation

MFG operated five native tree nurseries and worked closely with local communities to implement forest restoration projects.

In Ivoloïna, 2410 trees (3 ha) were replanted within the forestry station.

At the request of the Analambo Community Association, MFG provided support and capacity building in order to reforest an 8-hectare parcel of degraded land just north of Ivoloïna's boundary. (See the story of Analambo in our Capacity Building section).

Around Betampona, we implemented Phase V of our Forest Restoration Project which officially began in April 2013 with a visit to each of the four tree nursery centers around the reserve. Convinced that the best way to protect the forest is to improve living conditions in surrounding communities, and particularly with respect to food security, a sustainable agriculture component was added to the program. During this phase, rather than distributing clove trees (an important cash crop in the region) as an incentive, participants received





ved bean and corn seeds as well as trainings on how to sustainably plant on hillsides using terracing techniques.

During Phase V, 96 new landowners participated; 10 788 seeds were planted in the nurseries; 8 000 trees were distributed and replanted; 36 hectares were reforested.

The project has continued to grow every year since its initiation in 2007. As of 2013, more than 50,000 trees have been planted covering over 126 hectares and more than 300 local people have been involved in the project to plant native rainforest tree species on their own land.



Bernard, MFG's National Representative and Research Coordinator, told us about the story of bean and corn cultivation.

*"At the beginning, the villagers who got involved in the project agreed upon the strategy of planting at least 50% of native trees on their own land rather than any other tree species. The problem with native trees is their slow growth and long term benefits. In response, we decided to plant some clove trees because of their rather good and immediate profit. But cloves are an invasive plant and the production of its oil requires a lot of fuelwood in the distillation process. So we had to find alternative solutions combining reforestation activities and farmers' needs for short term income sources.*

*After gathering local people and collecting their needs, we agreed to start with the cultivation of beans and corns because they can be used for domestic use or be sold in the market.*

*A training of the eight nurserymen was organized by MFG's model farm team. Actually, the nurserymen play a key ambassador role; they live in the village, train the local farmers, support their work and ensure the daily follow-up of plantations. In 2013, all the villagers involved in our reforestation project were trained, 60 kg of bean seeds were distributed and cultivated. 50% of the*

*villagers succeeded in using the new techniques. The next step will be to educate the farmers on composting techniques to improve soil structure. After one year of implementation, it is difficult to draw any definitive conclusion. We know it takes time for people to change their traditional habits. However, we are confident; since the beginning of our reforestation project, we build upon our experiences and the project evolves each year to meet our sustainable development goals related to food security".*



## CONSERVATION RESEARCH: *to improve knowledge*

The MFG's Conservation Research program encompasses all activities related to scientific research carried out by its staff. The MFG's key research objectives, mostly at Betampona Natural Reserve, are to acquire a comprehensive picture of the number and diversity of species within the Reserve, characterize the genetic, demographic and health profiles of select taxa, describe the ecological relationships of key animal and plant species and identify environmental and anthropogenic pressures that threaten species' survival. MFG and visiting researchers have amassed valuable information on species distribution, forest structure, climate, plant propagation, water quality and other data from years of research and survey work. To date, Betampona is home to 69 reptile species, 76 amphibian, 89 bird and 11 primate species. 807 vascular plant species have been inventoried, and this list is still growing.

Our research program is comprised of three main components, and many long-term research activities continued to be carried out this year.

### **Biodiversity and conservation research at Betampona and Ivoloina Forestry Station**

Our main ongoing activities consist of identifying the diversity of animal and plant species, studying select taxa, community ecology, anthropogenic and natural causes for species declines, the extent and impact of invasive species, mapping species distribution, ...

In 2013, 45 fauna inventories enriched our data collection on lemurs (1094 individuals observed), amphibians (1100), reptiles (909), birds (840) and other mammals (98).

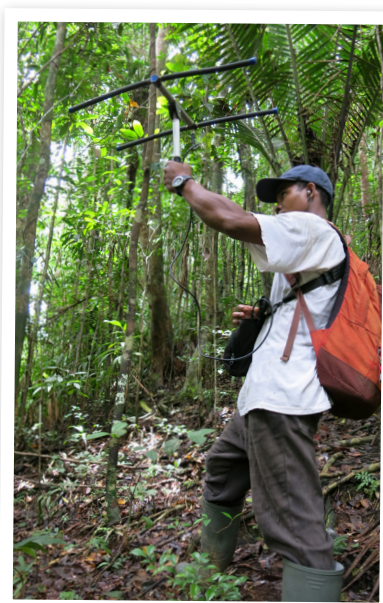
Data collection of flora phenology was conducted on 15 plant species (100 individuals) and for the first time 195 *Pentachlaena betamponensis* (local endemic and threatened species) were planted.

### **Ecoagriculture and soil restoration research**

We implemented research trials to design and develop best management practices for an ecoagriculture system using native species, soil and compost quality testing, composting techniques, etc.

### **Endangered species husbandry and propagation research**

We applied husbandry and veterinary research on select animal lemur and amphibian species. We also worked on the development of best methods to propagate eastern rainforest tree species and plant propagation techniques: Vesicular Arbuscular Mycorrhizae (VAM), vegetative replication.







## Visiting researchers

We also collaborated with other researchers whose work is summarized below. They complimented the in-house research carried out by our full-time staff.

**Dr Chris Golden** is an ecologist and epidemiologist based at Harvard University and Director of HEAL (Health & Ecosystems: Analysis of Linkages) studying ecosystem services and their impacts on human health and nutrition. His researcher team, **Josoa Rabehatonina** and **Andritahina Rakotosoa**, worked in 19 villages surrounding Betampona to survey local dependence on wild-caught food (bushmeat) and the impact that this has on their diets and ultimately their health. This research was funded by the Saint Louis Wildcare Institute.



**Lydia Razafindralay** of the University of South Paris carried out her Master's thesis study on the impact of various historical planting regimes on the spread and density of a native but nuisance fern, *Dicranopteris linearis*, at Ivoloïna. She trialed two manual methods of control for the fern and compared the efficacy of them.

**Sean McCartney** is a Master's student at Clark University, USA interested in the study of invasive plant hotspots using GIS techniques. He came to Ivoloïna to map invasive plant distributions.

**Njara Razakaniaina**, a student at the Department of Plant Biology and Ecology at the University of Antananarivo came to Betampona to carry out his Master's study on various means and impacts of controlling the invasive Moluccan raspberry (*Rubus moluccanus*). He trialed two different methods of cutting and uprooting.

**Theo Linders** of the Wageningen University, Netherlands conducted his Master's study on the impact of invasive exotic guava (*Psidium cattleianum*) on snail distribution

and species composition. His work included the first thorough inventory of snails for Betampona and preliminary results suggest that there are at least 47 species with some potential new species.

**Simon Razafindramoana** from the University of Antananarivo and **Sarah Federman**, from Yale University, USA, began research into phenology of various *Canarium* tree species at Betampona, which are key food sources for black and white-ruffed lemurs (*Varecia variegata*).

**Lana Kerker** based at Washington University at Saint Louis, and **Tantely Rakotondriamanga** at the Department of Animal Biology at the University of Antananarivo, spent one year in the field to examine group dynamics, habitat use and ranging behavior of the indriids of Betampona (*Indri indri* and *Propithecus diadema diadema*).



**Dr Sharon Deem, Ingrid Porton, Amy Alexander and Vololonoro Holiarimino**

This team from Saint Louis Zoo, USA and their counterpart student, Mino, from the Department of Animal Biology at the University of Antananarivo, conducted a biomedical survey of the diurnal lemurs of Betampona and collection of samples for genetic evaluation of group composition and population dynamics (inbreeding, genetic variation, etc.).

**Jean Jaques Rafanomezantsoa, Fidelisy Bemaheva, Claver Randriandrasana and Christian Ranaivo**

This team from the Malagasy branch of the California Academy of Science came to Betampona to continue their studies on ants, this time concentrating on arboreal canopy species. To date, 307 species of ant have been identified in Betampona.

**Dr Angelica Crottinni, Gonçalo Rosa, Dr Daniele Salvi, Dr James Harris, Emanuele Scanarini, Dr Franco Andreone**

This team of international herpetologists from a variety of institutions including *Centro de Investigação em Biodiversidade e*

*Recursos Genéticos* (CIBIO), Portugal, Natural History Museum of Turin, Italy and Durrell Institute of Conservation and Ecology (DICE), UK came to Betampona for several weeks in November to carry out a survey on reptiles. As well as a taxonomic and genetic inventory, the team also collected samples to study parasite loads and health of reptiles.

**Patrick Ravatsy** from the School of Economics at the University of Auvergne, France, carried out his field work in 2012 but completed his Master's thesis in March of 2013. He evaluated the Betampona Forest Restoration Program and made recommendations for the future of the program.

**Lala Randriatavy** from the University of Antananarivo continued his PhD research into the impacts of various mechanical guava (*Psidium cattleianum*) management techniques using four control methods: "ring barking", coppicing, uprooting and uprooting in combination with native tree plantation.

**Jean-Baptiste Bing**, a geography PhD student at the University of Geneva, spent six weeks at Ivoloïna to study the uptake and passing on of "vernacular" knowledge and its relationship to scientific knowledge. This work is part of a larger study comparing the circulation of vernacular knowledge in Betsimisaraka and Javanese cultures.

More long term studies were also conducted: **Dr Wasit Wulamu** is an assistant professor at the Saint Louis University Center for Sustainability and an expert in Remote Sensing. Wasit has been working with MFG since 2009 to develop a dedicated geo-database mainly focused on Betampona. He has been working to develop detailed maps of land use and land cover types for Betampona and the surrounding area. He has also been developing new techniques for mapping the extent of invasive and nuisance native plants to allow us to develop management protocols for their removal.



#### Scientific publications with MFG's contribution

Barrett, M., Brown, J., Junge, R.E., Yoder, A. 2013. Climate change, predictive modeling and lemur health: Assessing impacts of changing climate on health and conservation in Madagascar. *Biological Conservation* 157:409-422. DOI: 10.1016/j.biocon.2012.09.003

Crottini, A., Bollen, A., Weldon, C., Dalton, D.L., Kotzé A., Jean Noël, Iambana B., Andreone, F. 2013. Amphibian survey and current absence of *Batrachochytrium dendrobatidis* (Bd) in Ivoloïna Park, Toamasina (eastern Madagascar), *African Journal of Herpetology*, DOI:10.1080/21564574.2013.833994

## Developing effective protocols for tropical hardwood propagation



Launched in 2012, this experimental project on vegetative propagation of *Dalbergia* (rosewood) and *Diospyros* (ebony) paired up with Missouri Botanical Garden (MBG) and funded by a Field Research Conservation grant through the Saint Louis Zoo, carried into 2013 with different experiments by ISSEDD student, **Zo Andrianavonjahasina**: cuttings taken during the wet season; impacts of hormone concentration on rooting success; effect of cutting length on rooting success. The goal of these experiments was to identify the conditions required for high levels of rooting success.







## ENVIRONMENTAL EDUCATION: *to raise awareness*

The Environmental Education program encompasses formal and informal education targeting students from the primary level up through university, raising public awareness on issues related to the environment, serving as a conservation information resource for political, business and other community leaders, participating in public meetings and celebrations and interacting with the print, radio and television media. All of the MFG's education activities, projects and resources have been developed to provide an integrated, multi-faceted approach to environmental education and training needs.

### *Saturday School*

The Saturday School supplemental classes (in French, mathematics and the environment) are organized every Saturday for children in their last year of primary school in the Toamasina, Ivoloïna and Betampona areas. These classes help to prepare students for the national CEPE exams which must be passed in order to advance into secondary school.

A new thirty page curriculum was finalized, encompassing eco-pedagogy, which is a fun and interdisciplinary way of developing basic knowledge and awareness, as well as respectful behavior toward the environment.

In 2013, MFG ran 30 sessions and reached 286 pupils from 27 different primary schools (EPP) in four school districts. The program proved its success once again with a CEPE success rate of 89%. Indeed, compared with the global result in each administrative zones (ZAP) concerned, the Saturday School sites show a higher rate of success (89 % vs 70 %) and a drop-out rate of just 7% (versus 26% in 2012).

Initiated in 2013, teachers from the various Saturday School sites gather together at Ivoloïna two times to receive training in curriculum resource use and pedagogical methodology, as well as to exchange their teaching experiences.

School lunch canteen project was organized in partnership with UNICEF, to improve program attendance rate.

School field trips were also organized for the four Saturday School sites to Betampona Reserve, Parc Ivoloïna and Andasibe National Park.



## Environmental Education Camps

To provide environmental education opportunities for children at the secondary school level, MFG offers one-week camps during school breaks in the spring and summer. Camps are held at Parc Ivoloïna and include theoretical lessons in ecology and endangered species conservation, as well as hands on activities such as building clay fuel-efficient cookstoves and composting. Experience is also gained through field visits to the tree nurseries, agricultural station and zoo. Children are also taken to the ICTC's laboratory for exposure, often for the first time, to microscopes and other lab equipment. Sporting events, and social gatherings around a campfire round out the camp experience.

This year, 3 camps were organized and 161 young people from 3 middle schools and one high school were trained to become "Green Ambassadors".



The role of these ambassadors is to create environmental leaders. Nirina, our EEC's manager, gathered the testimony of Clara, an earth sciences teacher at Toamasina II High School, talking about the impact of one action of "Green Ambassadors" at school.

*"I was so curious to know what the students had done and learned at the park. As a concrete example of their action, I can tell about improved cleanliness of the school toilets."*

*Actually, my colleagues and I realized that the toilet was so clean after they came back from camp. Before, the toilet was so dirty, and it was hard to find a place to put your feet."*

*I've only been teaching at this high school for this school year. As I am new, I do not want to go home for lunch because we live far from the school, so I bring my lunch. I didn't know yet where the teacher's toilet was."*

*Directly I went to this place. And you can imagine what happened. There was no space to put my feet. But, fortunately, we have those trained "Green Ambassadors". In that time, I thought that there is nothing to do for this toilet, and there is no one who would dare to clean it. But they've done it after their training at the center."*

## Girls' Science & Leadership Camp

For the first time, in honor of International Women's Day on March 8th, MFG organized a special three-day "Girls' Science and Leadership Camp". The aim of this event was to promote leadership among young girls, as well as to educate them on their rights and responsibilities as women in Malagasy society, and to expose them to different professions available to women in the Toamasina area, particularly in the sciences. 30 girls attended the first camp. This activity was so successful that we repeated it for a second session of 30 girls in August 2013.





## Empowering communities

This year, a very special flower planting competition was organized with local communities in order to transform a garbage dump along the side of the road on the way to Ivoloïna into a nice garden.

Five women's associations and three individuals got involved to continue to care for this new community green space.

Véronique, MFG's laboratory manager, told us about the community involvement in this initiative.



*"People from Toamasina used to throw garbage right at this spot. During WED, we made a cleaning operation, but some days later, unfortunately the spot was again very dirty. We tried to find a solution together with the villagers to get this place cleaned up. The idea of transforming the spot into a flower garden came from a local*

*woman! Today, the 15m x 2m area is covered with colorful flowers and people no longer pollute it."*



## Public awareness events

Each year, MFG organizes several celebrations, which are always well attended and appreciated by the communities.

For World Environmental Day (WED) on June 5th, MFG held events at three sites around the theme of "sustainable food consumption". It was a huge accomplishment with more than 2500 total people participating. In honor of WED, 11 mayors and the "Chef de District" of Toamasina II were invited to visit Betampona Reserve, before attending the event in Ambodiriana. Film projections, a foot race, and dance performan-

ces took place and pupils from our Saturday School program got involved in writing poems. At Ivoloïna, the event included a debate, exhibitions, a carnival, village tours, songs, a cooking competition and a men and women's soccer tournament.



## Training community conservation leaders

Initiated two years ago with the network of professional conservation educators «REPC», in partnership with Durrell Wildlife Conservation Trust (DWCT), the project was part of our global action to improve the management of protected areas, by providing community leaders with the means to better manage their natural resources.

MFG was chosen to be one of just three host institutions in all of Madagascar, and to contribute to the building of five specific modules on biodiversity, sustainable development and environment as well as management abilities and leadership.

MFG also ensured the trainings and post evaluations of 12 community leaders who attended the month-long training held at Ivoloïna in 2013.





## Educational outreach through media

### **Bitsik' Ivoloina** (Whisper of Ivoloina)

This Malagasy-language newsletter written by MFG's environmental education team contains locally relevant information such as sustainable farming techniques, topics related to biodiversity and endangered species and other environmental awareness raising news.

The target audience is the local population living in the Betampona and Ivoloina landscapes; including farmers, teachers and children. In 2013, 3 000 copies were distributed for free to all the local schools, boyscout groups, partners, and priority villages around Betampona.



### **Radio**

In March 2013, MFG launched its new hour long radio program called *Bitsika'ny Ala Atsinanana* (Whisper of the Eastern Rainforests) which airs on a local radio station four times per week.

Staff from MFG's different departments take turns discussing conservation work, as well as general environmental issues in Madagascar. Particular focus is on the biodiversity found in Madagascar's eastern rainforests.

30 broadcastings were recorded in 2013. Topics included: soil fertility maintenance, frogs of Betampona, renewable natural resources, bees and farming, the importance of Saturday School in improving results in education.



## Partnership with UNICEF

2013 marked the end of a two-year partnership with UNICEF as part of our environmental education program. The program, called Connecting Classrooms and Youth for Biodiversity Conservation (CCYBC), aimed to link together school youth around Ivoloina and Betampona to share information and identify the best practices in order to promote their participation in conservation action. It is comprised of three components:

### **1) Connecting Classrooms**

More than 200 young people (100 girls, 100 boys) gained a greater understanding and knowledge of mobile and web-based technologies and how to use them to affect change, to increase their web literacy,

to cultivate mature online self-presentation and to build self-confidence.

### **2) Malagasy Youth Network for the Environment (MYNE) /Junior Reporters Club (JRC)**

18 members of MYNE and 10 members of JRC gained increased knowledge and awareness on key thematic issues affecting young people around the world, including gender inequalities, youth and community mobilization, equity, climate change, global health, and agriculture during a week-long "youth summit" held at Ivoloina.

### **3) Saturday School Program** (for the results, please see above).







## CAPACITY BUILDING: *to strengthen local ability for sustainable development*

The Capacity Building program encompasses all adult training activities, as well as partnerships with local universities to improve graduate programs in natural resource management, science and veterinary medicine.

### *University training activities and supervision of student theses*

As well as our own in-house research activities, we also welcome independent researchers to Parc Ivoloïna to carry out their studies. This also addresses MFG's research goals as we welcome Malagasy students, especially from Toamasina University, and train them in research techniques and practical conservation skills. The Institute for the Environment and Sustainable Development (ISSEDD - formerly known as GRENE) is one of our closest partners.

**Agathe Razanabololona** from ISSEDD, carried out her Master's study at Ivoloïna on the growth and maturation of *Paretroplus pollyactis* fish, an endemic Malagasy species with potential for commercial farming.

In 2013, we also mentored and supervised four Malagasy students for their License or *Diplôme d'Etudes Approfondies* (DEA), bachelor's degree or post graduate degree, respectively.

**Godfrey Tahindrazana** from the University of Antananarivo, studied the impact of forest restoration activities with respect to establishment of invasive plants in Ivoloïna Forestry Station.

**Manitra Ny Aina Dinasoa Nandrianina Rasolombololona** from the University of Toamasina focused on the contribution of agroforestry in the rural economy of Ambonivato fokontany.

**Nasserddine Mohamady** from ISSEDD carried out a study on the enhancement and ecological monitoring of agroforestry in Ambonivato.

**Nasserddine Rakotonandrasana** from ISSEDD worked on the valuation of a previous reforestation action in Ivoloïna Forestry Station.

As part of our partnership with ISSEDD, we also held:

- Three practical lessons on lab use, fish dissection and vertebrates,
- A three day outing to Ivoloïna for second year students on the theme of agroforestry,
- A week-long study trip for third year students beginning at Ivoloïna, stopping and discovering 10 different nature spots on the east coast and ending at the Tampolo Forest Reserve north of Fenerive Est. This was an excellent opportunity for the students to put their knowledge and skills into practice, while comparing various forest and marine conservation projects along the eastern coast of Madagascar

A new agreement was signed and a mutual annual work plan aiming to strengthen the technical and scientific techniques of ISSEDD teachers, researchers and students was established. This was the fruit of a two-day meeting combining a field visit to each of Parc Ivoloïna's departments and one day to draft and edit the plan, its specific goals and their linked activities.

MFG is also very invested in capacity building for members of its own team.

In 2013:

- The team from the Model Station (three persons) had the opportunity to travel to Ambatondrazaka and Andasibe to see what farmers in those regions are doing.
- Pascal and Rakoto from the zoo attended a live insect rearing training at Mitsinjo for our new Amphibian Conservation Center
- Jean Francois, our head tree nursery manager, visited Mitsinjo to learn about endangered orchid propagation.
- A butterfly rearing training for MFG staff was given by the "Farmers Lending a Helping Hand" Association.
- Véronique, our lab manager, spent 10 days at FOFIFA in Antananarivo learning about quantitative soil analysis.
- Maya, MFG's Program Manager, attended a five-day training on Leadership and Project Management for Conservation Professionals at Durrell on the island of Jersey.



## Training neighboring communities in sustainable agriculture

MFG's staff provides training to local farmers mainly at the Model Agroforestry Station in Ivoloïna. Techniques taught include composting locally available waste materials, hillside cultivation to reduce soil loss, and organic vegetable garden. Around 250 participants attended trainings at the Model Station in 2013.

Over the course of four days, organized and taught by Peace Corps Volunteer Beth Drouhard and MFG's team, 16 farmers from Ambonivato, the village outside of Parc Ivoloïna, received trainings on improved agroforestry techniques, including the creation of "food forests", diversified agricultural plots modeled after forests.

MFG's eco-agriculture advisor, Christof den Biggelaar from Appalachian State University in North Carolina USA, also spent 3 ½ months at Ivoloïna in the second half of 2013. He looked at historical use of land in and around the Ivoloïna Forestry Station, as well as conducted a livelihood strategy survey with farmers around Ivoloïna and Betampona Reserve.

MFG also operates a leader farmer coaching program whose aim is to establish groups of motivated farmers and facilitate their exchange on sustainable agricultural techniques in four *fokontany* surrounding Parc Ivoloïna.



### Model Station Production

The System of Rice Intensification (SRI) is a practice developed in Madagascar in the eighties, based on irrigation with a minimum quantity of water and the transplanting of very young seedlings set individually. It aims at increasing the yield of rice produced in farming. Twice per year, student from our Saturday School at Ivoloïna help out with transplanting, harvesting and calculating yield. In 2013, the yield from our Model Farm's SRI paddy was 5,61 tons per hectare (average yield with SRI being 5 tons/Ha).

Fruit and vegetable production at the Model Station increased this year and contributed to feeding the animals in the zoo. 23,31 m3 of compost, 3,614 kg of fruits, 575 kg of vegetables, 12 kg of honey (construction of 4 small hives and 3 hives) were produced.

Total value of the production: 1,879,150 Ar (\$854)

The Model Farm also had a bumper crop of tomatoes (147 kg) in 2013.



Christian, MFG's sustainable agriculture program manager, told us about it:

*"Tomatoes found in Toamasina's market come mainly from the highlands. Actually, the climate in the eastern coast is often too wet for their cultivation; they are very vulnerable to disease and the farmers are not really used to planting them. However, people eat tomatoes on a near daily basis. So, as part of our program on food improvement, we thought it would be a good idea to carry out trials to find the best cultivation technique for tomatoes around Ivoloïna and Betampona. We planted some seeds on sloping ground and lowland and had a huge production success. We are still in the testing phase, but we can proudly say that we are off to a good start!"*





## *Teacher training program in environmental education*

In the past, MFG focused on Chefs ZAP (school district supervisors) for our intensive teacher training workshops. The Chefs ZAP were then tasked with passing on knowledge from these trainings to their directors of schools and teachers. However, we were not satisfied with these “cascade” trainings, and decided to adopt a new approach, reorienting our program to focus on direct training of the teachers rather than Chefs ZAP.

Teachers from the four schools which produce our “green ambassadors” were selected to attend two week-long sessions held at Ivoloïna. In this way, we ensured direct supervision and better follow-up on our green ambassadors.



## *Practical work at Ivoloïna’s laboratory*

The goal of our laboratory is to fill the need for hands on practical lab work for students, natural resource managers, and relevant professionals in the Toamasina area.

Around 570 school children and students visited Ivoloïna’s laboratory to conduct practical work in 2013. The number of visitors continues to increase every year (455 in 2012) and the number of ISSEDD students using the laboratory (301) doubled compared to 2012 (143).

The lab was mainly used for conducting analysis of soil, water quality and compost (30%) and microscopy (17%).



## *Support and training of a local community association*

MFG provides support and capacity building in response to community needs. This was the case with Analambo Community Association which bands together 18 households in the area surrounding Parc Ivoloïna. Mamy, MFG’s Capacity Building Program Manager, told us about MFG’s work with the Analambo project.



*“The project began in 2010 when the Analambo Association approached us and asked for assistance in protecting the remaining part of a primary forest that was seriously threatened. In addition, this 8 hectare area provides water and the risk of water scarcity was becoming critical. In 2011, we completed a forest inventory and discovered one of the four Malagasy endemic tree families, called*

*Sarcolanaceae, in this forest. The area became a community conservation spot where we collect seeds and carry out research. In 2012, we began to conduct capacity building with this association, including offering 9 training modules on natural resources management, biodiversity, environment protection, etc.*

*2013 was the year of patrolling and forest restoration. We also developed micro projects with the association on composting and SRI. In terms of outcomes, we can say that the area has become much better protected. No illegal visits were registered in 2013 and tree saplings are now beginning to grow. The next step will be to provide further capacity building trainings in sustainable agriculture and better use of composting techniques.*

*It’s very encouraging to see our work paying off”.*



## *Prosimian Congress at Centre ValBio*

MFG attended the 5th Annual International Prosimian Congress (IPC) that took place from August 4th to 9th in the halls of the Centre ValBio at Ranomafana National Park. This congress was “recognized as the most important global meeting for primatologists studying any aspect of prosimian biology to present and share their experiences”.

The IPC was the first such meeting to be held in Madagascar and offered a real opportunity for Madagascar lemur researchers and conservationists to have exchanges and gain information.

MFG’s team gave a presentation on the role that Madagascar’s zoos can play in global captive breeding programs for lemurs and another one entitled “From Environmental Education, through the Saturday School Program, to Success at School”, that described allowed others to learn more about our successful model combining French, math and environmental education.



## *MFG’s 25th Anniversary*

Over the course of three days in November, MFG members from across the globe came together to attend the Annual Steering Committee meeting at Parc Ivoloina.

Amongst the meeting participants were the Chair and Vice Chair of the MFG (Saint Louis Zoo), as well as representatives from Zoo Zurich, Seneca Park Zoo, Isle of Wight Zoo, Duke Lemur Center, Cango Wildlife Ranch, Taipei Zoo, Missouri Botanical Gardens, as well as Durrell Wildlife Conservation Trust.

This event was kicked off with a special viewing of the 25th Anniversary MFG promotional

video made by Madasoleil, presentations from partner organizations such as the Malagasy Ministry of Environment and Forests (MEF) and the Veterinary School based in Antananarivo; an interesting presentation by Dr. Chris Golden on his human health research around Betampona; and finally, visits to MFG facilities.



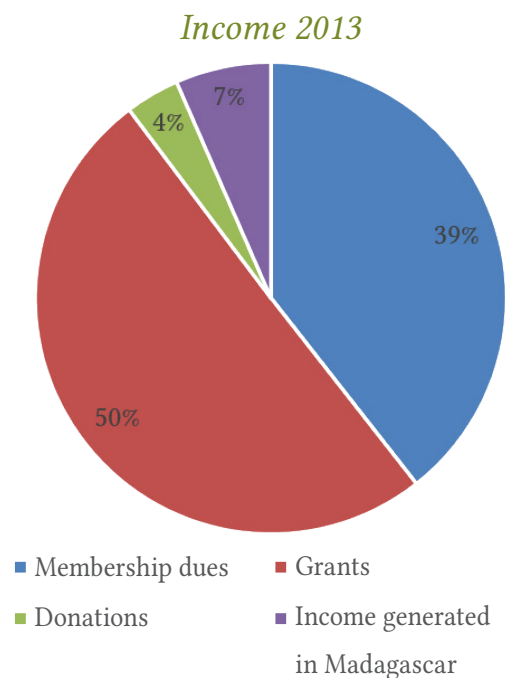




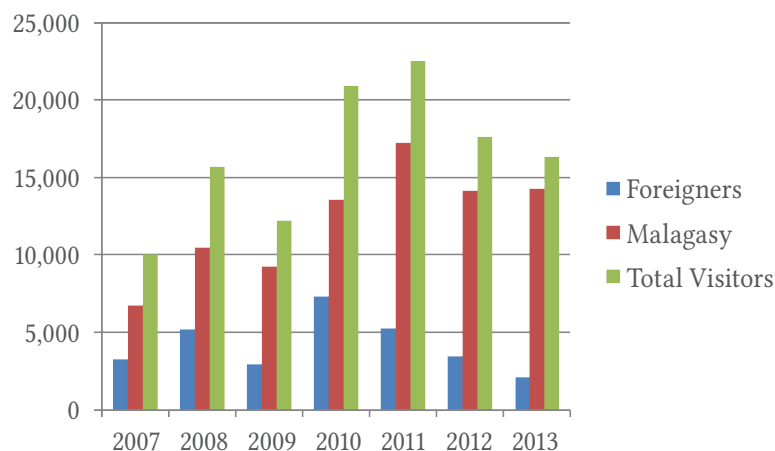
## FINANCIAL SUMMARY

MFG operates on an average annual budget of approximately US\$ 350 000, of which 7% is generated within Madagascar. 39% comes from the MFG Members, 50% from grants and the remainder from donors.

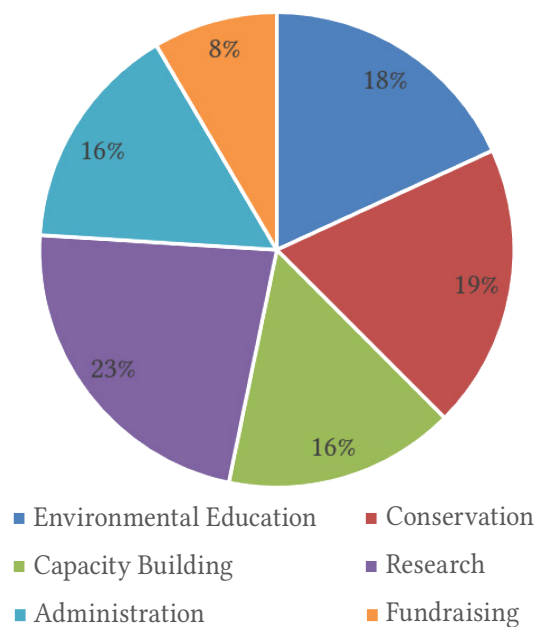
In 2013, significant support came from the Saint Louis Zoo Wildcare Institute, Planet Foundation, Guhl Foundation and UNICEF.



### *Parc Ivoloina Visitation*



### *Expenses 2013 Per Program*



## *Income generation in Madagascar*

The 2009 political crisis in Madagascar led to a strong decline in tourism over the last few years. In 2013, tourism decreased by 22% nationwide and the impact on Parc Ivoloina income was noticeable. In addition, a Costa cruise ship accident at the end of 2012 and other issues of insecurity led to just one cruise ship visit in 2013.

Two-thirds of MFG income generated in Madagascar comes from Parc Ivoloina entrance fees, and foreigner visitors are the main contributors (a foreign adult entrance fee is 98% higher than that of a Malagasy adult ticket). Thus, a decline in foreign visitors (1281 less than in 2012) led to a direct decrease of 7,000 USD from local earnings in 2013.

With the recently democratically-elected government now in place, we are hopeful that park visitation numbers in 2014 will return to those seen in 2011 (23 000 total visitors).

MFG is also thinking of new ways to increase income in Madagascar through the development and implementation of a new business plan.



## Looking ahead to 2014

2014 will be the year of many new beginnings while continuing to focus on improvement of pre-existing programs and activities.

Our monitoring and evaluation system will be improved. Initiated in 2014, “spotchecks” will be reinforced and better formalized; logical frameworks for each of our programs will be edited and we will create some facilitating tools for MFG staff to better evaluate their operations.

Within our four programs, we present some actions which we plan to implement in accordance with our mission to conserve Malagasy biodiversity.

### CONSERVATION ACTION

Invasive toads and chytrid fungus (infectious disease causing global amphibian extinction) will be a major focus :

- MFG joined the Amphibian Survival Alliance (ASA) and is coordinating efforts to map distribution of the invasive toad, *Duttaphrynus melanostictus*.
- The expansion of our amphi-

bian conservation breeding center will allow us to be among the key players of *ex situ* amphibian management and husbandry in Madagascar.

- MFG received a seed grant from the Amphibian Ark to further develop biosecurity measure at Ivoloïna’s captive breeding facility for Malagasy amphibian in peril.
- Further trainings from Association Mitsinjo will be organized with support from Durrell.

We also aim to install an orchid pathway in partnership with IS-SEDD, Association Mitsinjo, and Association de Défense de la Forêt d’Ambodiriana (ADEFA).

Our restoration project in Betampona will enter its sixth phase, with the introduction of incentives in the form of “conservation credits”.

### CONSERVATION RESEARCH

A three-day Conservation Research Workshop will be held at Saint Louis Zoo in August in which key research partners,

both past and present, have been invited to update the MFG on their research activities and to prioritize future research activities.

We will try a new “team” approach to research in the Betampona Reserve to facilitate transfer of skills between the team members and allow for faster accumulation of analyzable data.

A pilot study on *Leptospirosis* will be initiated by Fidy Rasambainarivo who is currently enrolled in a PhD program at the University of Missouri, St. Louis. In the summer of 2014, he will initiate a pilot study investigating the occurrence of *Leptospirosis* in Betampona Natural Reserve and several villages around the reserve.

### ENVIRONMENTAL EDUCATION

The renovation of the EEC’s exhibition room and new signage at the zoo will be completed.

A new Saturday School site will open at Analamangahazo to reduce the distance travelled by students at our Ambodiriana site.

### CAPACITY BUILDING

New partnerships will be forged (with the Veterinary University) and old partnerships strengthened.

- We will develop a closer collaboration with the MEF, for a project of capacity building of Malagasy parks on animal care standards.
- Our leader farmers program will be revitalized and extended to five *fokontany*.
- Some international travel opportunities for staff will be offered: Environmental Education Program Coordinator, Nirina RAKOTOMALALA, will attend the International Zoo Educators Conference in Hong Kong, September 2014 and Jean Noel, head agent at Betampona, will attend the Conservation Research Workshop in August.

Finally, we are pleased to welcome 2014 new members, Taipei Zoo and Wellington Zoo, and look forward to welcoming many more to the MFG family.





## How to get involved? MFG's Team

Here are easy ways to get involved and support our actions to conserve Madagascar's incredible biodiversity:

- Join the MFG by becoming an institutional member and directly fund *in situ* conservation action in Madagascar.
- Sign up for our e-mail list to receive Eighth Continent Quarterly newsletters. Send requests to [tim@savethelemur.org](mailto:tim@savethelemur.org)
- «Like» us on Facebook and follow our news and other updates concerning our work and Malagasy biodiversity
- Volunteer with us in Madagascar for three months. Submit resume and cover letter to [tim@savethelemur.org](mailto:tim@savethelemur.org)

## Thanks to the members and donors of MFG

We wish to thank these institutions who paid annual dues in 2013 that contribute to the operating costs of the MFG's many conservation efforts in Madagascar.



### Managing Members

Cologne Zoo  
Duke Lemur Center  
Lemur Conservation Foundation  
Missouri Botanical Garden  
Naples Zoo  
Saint Louis Zoo  
San Antonio Zoo  
San Diego Zoo  
Zoological Society of London  
Zoo Zürich

### Sponsoring Members

Cleveland Metroparks Zoo  
Hogle Zoo  
Leipzig Zoo  
San Francisco Zoo  
**Contributing Members**  
Allwetterzoo Münster  
Akron Zoo  
Cango Wildlife Ranch  
Dickerson Park Zoo  
Indianapolis Zoo  
Isle of Wight Zoo

Los Angeles Zoo  
Paris Zoo  
Seneca Park Zoo  
South Carolina Aquarium  
The Living Rainforest  
Tropical Butterfly House  
Ueno Zoo

**We also thank:** Durrell, Guhl Foundation, Planet Foundation, Saint Louis Zoo Wildcare Institute, and UNICEF for their financial support.





Madagascar Fauna and Flora Group / Parc Ivoloina  
BP 442 (en face Hopital Manara Penitra) Morafeno, Toamasina (501)  
Tel. Bureau : 020 53 30 842 Tel Mobile : (0261) 32 05 10 307  
Email : mfgmad@moov.mg

MFG c/o Saint Louis Zoo  
1 Govenment Drive, St Louis MO 63110 USA