ANNUAL REPORT for 2018

Association Vahatra

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A MESSAGE FROM THE PRESIDENT OF VAHATRA, ACHILLE RASELIMANANA, DR. HDR

Available information on the biodiversity of Madagascar, specifically its exceptional richness and uniqueness to the world, has evolved considerably over the last 25 years. Major efforts have been made to better ensure the proper management and conservation of this natural heritage. These aspects are demonstrated by the increase in the number and surface covered by the country's protected area system following the Durban Declaration in 2003. Integrating scientific knowledge on biodiversity into the design and implementation of management and conservation strategies is an essential process, forming one of the pillars of conservation biology.

Since its creation over a decade ago, Association Vahatra has devoted considerable time and energy to bring field studies and aspects of conservation biology to the forefront on Madagascar, to better manage the unique biodiversity of the island. We are convinced that the availability and accessibility of scientific data and information concerning this natural heritage to different users, ranging from students and scientists, protected area managers, and the general Malagasy public, are crucial. Some years back, the association organized in collaboration with Lucienne Wilmé, the "PDF project" which consisted of assembling a considerable number of published documents and making these available in an organized fashion in DVD format to different national students and researchers. This project helped to fill in a considerable void to the local scientific community, but because most of the documents were technical, fell short of what was needed for non-specialists, including protected area managers.

Given the nearly exponential increase in information on Malagasy biodiversity, the evolution of conservation policies and strategies on Madagascar, and the expansion of the protected area system over the past few decades, there was an important need to update a 1989 book written by Martin Nicoll and Olivier Langrand on the island's protected areas. Given this need, Association Vahatra decided to launch a large-scale project funded by The Critical Ecosystem Partnership Fund to update the Nicoll and Langrand seminal compilation. The resulting French-English bilingual book published by Association Vahatra in late 2018 and under the title "*Les aires protégées terrestres de Madagascar : Leur histoire, description et biote / The terrestrial protected areas of Madagascar: Their history, description, and biota*", is the compilation of information on different aspects of 98 selected protected areas. The book will be formally presented in early 2019 in Antananarivo. In generally non-technical language, the three-volume book makes available to a wide audience many details on these sites, which are important for national or international ecotourists, protected area managers, and students and members of the scientific community. In addition, aspects of the dynamics (forest cover and fire dynamics) of the ecological landscape are detailed for each site, providing an overall vision of trends, positive or negative, in terms of protected area management and conservation. Certainly, the challenges are daunting, but with a valiant heart nothing is impossible.

The new protected area book is intended as a tool and should help to make a difference and advance necessary improvements to the current efforts to protect and conserve the unique biodiversity of the island. It will be an important reference for a good number of years. It is certain that with continued scientific research and the advancement of the island's protected area systems, certain portions of the book will be quickly out-of-date, hallmarks of advancement by the Malagasy authorities and scientific and conservation communities to protect the remarkable local biota. We would like to express our sincere and heartfelt thanks to all from near or far that have contributed to the realization of this monumental work. Thank you so much!

Achille P. Raselimanana

LONG-TERM GOALS

The long-term goals of Association Vahatra are to advance Malagasy scientists, in particular graduate students within the university system, as well as other members of the national conservation biology community, and make substantial advances in understanding the island's unique biota. Our sincere intent is to put in place an organization with a long-term future. A critical aspect to mention is that we have created this vision largely based on the scientists and students working with the association, and, hence, distinctly Malagasy in prospective. This is in comparison, for example, to large international organizations that might not necessarily have the interests of Madagascar as their principal point of perspective. This aspect is fundamental for the long-term strength of the association, since members are engaged and committed by their own conviction with regard to the study and conservation of their natural heritage.

The seed was planted for Association Vahatra in what is now close to three decades ago in the context of a project organized by WWF-Madagascar, put in place by Olivier Langrand and Sheila O'Connor, and known as The Ecology Training Program (ETP). Steve Goodman and Achille Raselimanana were the coordinators of the project for many years, during which time several generations of graduate Malagasy students finished their higher degrees within the university system in animal and conservation biology. Many of these people are amongst the major actors in the current Malagasy conservation biologist community. These individuals are now responsible for the advancement of new generations of national field biologists in at least three different manners: 1) lecturers and professors within the national university system, 2) active scientific members of the Vahatra staff, and 3) playing important roles and holding key positions in the non-governmental and governmental sectors. Association Vahatra places strong emphasis on capacity building and continues this tradition and the body of well-trained nationals continues to grow, as well as dissemination of information to the scientific community and the broad Malagasy public.

VAHATRA – PERMANENT STAFF

1. Professor Achille P. Raselimanana – President of Vahatra and Professor, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo. Founding member. Achille was in the first generation of ETP graduates (see above) and did his DEA and Ph.D. in the context of this program. In 2011, he presented his "Habilitation à Dirigerdes Recherches" (HDR) at the Université de La Réunion, which is the highest scientific degree in the French university system. Achille is a herpetologist with considerable experience in aspects ranging from field studies, classical taxonomy to molecular systematics. Before the creation of Association Vahatra, he held for nearly a decade the position of Biodiversity Program Officer for WWF-Madagascar. In 2018, Achille was named "Professeur titulaire" by the Ministère de l'Enseignement Supérieur et de la Recherche Scientifique (see section below).
2. Dr. Marie Jeanne Raherilalao – Co-editor of the journal *Malagasy Nature* and books published by Vahatra and Professor, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo. Founding member. Marie Jeanne did her Ph.D. associated with the ETP (see above). She works on bird ecology, biogeography, and systematics.
3. Dr. Voahangy Soarimalala – Scientific Coordinator at Vahatra; Head Curator, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo; and Professor, Université de Fianarantsoa. Founding member. Voahangy did her DEA and Ph.D. in association with the ETP (see above). Voahangy is a mammalogist with a particular interest in rodents and tenrecs. She was elected in 2018 as the College President, Université de Fianarantsoa.
4. Professor Steven M. Goodman – Scientific Advisor at Vahatra; co-editor of the journal *Malagasy Nature* and books produced by Vahatra; and Docteur Honoris Causa, Université d'Antananarivo. Founding member. Steve works on both mammals and birds. He holds the post of MacArthur Field Biologist, Field Museum of Natural History, Chicago, and is based in Madagascar most of the year.
5. Mrs. Sabrina Raharinirina – Financial & Administration Manager. Sabrina joined the association in October 2015.
6. Mr. Rachel Razafindravao called "Ledada" – logistic coordinator. Ledada started working with the ETP some 25 years ago and transferred to Vahatra in October 2007. He has helped organize logistics for hundreds of field missions to some of the remotest areas on Madagascar.
7. Mrs. Sandra Ratsirahaingotiana – domestic help. She has worked with Vahatra since May 2016.

8. 8-10. Mr. Elisa Malaimbohitsy, Mr. Mara Avisoa, and Mr. François Tsitindria – guardians.

VAHATRA'S BOARD OF DIRECTORS

In order to provide needed guidance and counseling for the current and future programs associated of Vahatra, a Board of Directors has been named, which includes the following individuals:

Malagasy nationals

1. Professor Daniel Rakotondravony – Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
2. Mrs. Nanie Ratsifandrihamanana – Country Director, WWF, Madagascar.
3. General Guy Ratrimoarivony – Général de Corps d'Armée, Director of Strategy Seminar, Center for Diplomatic and Strategic Studies.
4. Mrs. Chantal Andrianarivo – Former Head of Research and Biodiversity, Madagascar National Parks and now Technical Advisor at Indian Ocean Commission.
5. Professor Joelisoa Ratsirarison – Département des Eaux et Forêts de l'Ecole Supérieure des Sciences Agronomiques, Université d'Antananarivo and Vice President of the University of Antananarivo in Charge of International Relations.
6. Mr. Jean Chrysostome Rakotoary – General Director of the Office National pour l'Environment (ONE).
7. Professor Raoelina Andriambololona – Institut National des Sciences et Techniques Nucléaires (INSTN), Université d'Antananarivo, General Director of INSTN and Member of the Malagasy Academy.

Foreign members

1. Professor Jörg U. Ganzhorn – Professor, Tierökologie und Naturschutz, University of Hamburg.
2. Mr. Paul Goodman – Principal, Kingfisher Group.
3. Mr. Olivier Langrand – Executive Director, Critical Ecosystem Partnership Fund (CEPF).
4. Mr. John McCarter – Former president of the Field Museum.
5. Mr. Michael Polsky – President, Invenergy.

STUDENTS

As capacity building for the next generations of national field and conservation biologists is at the core of Association Vahatra activities, we work directly with Malagasy students registered within the national university system and at the levels of different types of higher diplomas: License, Master's II or Ph.D. degrees. In recent years, the Malagasy national university has shifted from the classical French scheme to that of an Anglophone License-Masters-Doctorate (LMD) system. Further, the scientific members of Vahatra are also in contact with many other Malagasy students as secondary advisors or members of thesis and other types of mentoring committees. We make a dedicated effort to work with graduate students in universities outside of the capital city of Antananarivo, including the former provincial capitals of Antsiranana, Toliara, Fianarantsoa, Toamasina, and Mahajanga. In addition, Vahatra staff members advise many other Malagasy students on aspects of their research, access to literature based on the fine library housed at Vahatra, and other forms of mentorship. Furthermore, several Ph.D. candidates working with other institutions or NGOs frequently request Vahatra scientists to be members of their graduate study committees.

Since Vahatra open its doors in late 2007, something approaching 2350 different student and research visitors not directly part of the association's

mentoring program have visited the office to use the library facilities or consult with the scientific staff. (These figures are based on a sign-in notebook.) In 2018 alone, over 150 different students and researchers from different faculties (Science, Agronomy, Veterinary Medicine, etc.) of national and private universities visited our library and many hundreds of documents (books, reprints, theses, etc.) were consulted.

Malagasy students passing through the Vahatra program have considerable success finding permanent jobs on the island and within governmental and non-governmental sectors. In many cases, these posts are in domains related to biology and conservation, for example, university appointments, working within NGOs, associated with the Madagascar National Parks, etc. Some of the former students hold key posts, for example, in different managerial capacities, such as at UNESCO, mining companies, The Ministry of Higher Education and Scientific Research, and The Ministry of Forestry and Environment. Hence, one of the mandates of the association, to advance science and conservation on Madagascar with focused mentorship of graduate students, is indeed meeting the original expectations. A good example of this is that numerous Vahatra graduates have obtained university appointments, providing an even greater means to advance capacity building for Malagasy field and conservation biologists. Below is the list of 2018 graduate students working on Licence, Master's II, and Ph.D. degrees under the direction of Vahatra scientists. After receiving their higher degrees from the university in collaboration with Association Vahatra, these well-trained young scientists are for the most part dynamic and with long-term visions, capable of designing and implementing research projects, and obtaining associated funding.

Graduate diplomas presented in 2018 or in preparation

As can be seen from the following lists, the scientific members of Vahatra are extensively involved in the advancement of Malagasy graduate students. We consider this one of the hallmarks of the association. Further, we encourage students to publish the results of their scientific work (see below, "Scientific outputs of Vahatra during 2018").

GRADUATE DIPLOMAS PRESENTED IN 2018 OR IN PREPARATION

As can be seen from the following lists, the scientific members of Vahatra are extensively involved in the advancement of Malagasy graduate students. We consider this one of the hallmarks of the association. Further, we encourage students to publish the results of their scientific work (see below, "Scientific outputs of Vahatra during 2018") and take their place in the international scientific community.

A) Licence, Master's, and Ph.D. diplomas presented by student members of Association Vahatra and under the direction of Vahatra scientists

1. Gauthier, N. E. 2018. Etude de la préférence en habitat de *Passer domesticus* et de *Foudia madagascariensis* dans la ville de Fénérive-Est. Mémoire de Master, Institut Supérieur de Sciences, Environnement et Développement Durable, Université de Barikadimy, Toamasina.
2. Nahavitatsara, E. R. 2018. Analyse de la structure de population et de la distribution écologique entre zones de culture et zones d'habitation humaine de *Duttyphrynus melanostictus*. Mémoire de Master, Institut Supérieur de Sciences, Environnement et Développement Durable, Université de Barikadimy, Toamasina.
3. Narivony, M. D. 2018. Etude de la relation entre régime alimentaire et fréquentation d'habitat chez *Duttaphrynus melanostictus*. Mémoire de Master, Institut Supérieur de Sciences, Environnement et Développement Durable, Université de Barikadimy, Toamasina.
4. Narojo, M. H. 2018. Contribution à l'étude de répartition d'*Eulemur rufifrons* dans le PN Ranomafana. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
5. Noroalintseheno Lalarivoniaina, O. S. 2018. Dynamique de population et de biologie de *Rousettus madagascariensis* G. Grandidier, 1928 (Chiroptera : Pteropodidae) de la grotte des chauves-souris d'Ankarana, Nord de Madagascar. Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
6. Rakotomamy, N. R. E. 2018. Etude comparative de l'abondance d'*Eulemur rufifrons* au sein du Parc National de Ranomafana et dans la zone périphérique. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
7. Raselimanana, M. 2018. Utilisation de l'habitat et structure de la population des caméléons dans la forêt de Kirindy CNFEREF, Morondava, Madagascar. Mémoire de Master, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
8. Rasolonjatovo, H. A. M. 2018. Détermination de l'avifaune subfossile du Parc National de Tsimanampesotse. Mémoire pour l'Obtention du Diplôme de Master, Mention Collection Paléontologique et Conservation, Université d'Antananarivo.
9. Sylvestre, M. H. 2018. Etude de la préférence en habitat de *Passer domesticus* et de *Foudia madagascariensis* dans la ville de Toamasina, Région Atsinanana. Institut Supérieur de Sciences, Environnement et Développement Durable, Université de Barikadimy, Toamasina.

B) Licence, Master, Ph.D., and HDR diplomas defended with implication of Vahatra scientists as a supervisor, lecture committee member or jury member

1. Andriamavosoloarisoa, N. N. M. 2018. Eco-biologie des Poissons du lac Mandrozo et analyse de l'efficacité du noyau dur, Région Melaky, Madagascar.Mémoire de Master II, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
2. Manjoazy, T. 2018. Ecomorphologie, bioacoustique et conservation des chiroptères dans les régions sèches de Madagascar. Diplôme de Doctorat en Sciences, Biologie Animale, Ecole Doctorale de Biodiversité et Environnement Tropicaux, Université de Toliara.
3. Marline, L. 2018. Diversity and biogeography of Madagascan bryophytes with an analysis of taxic and functional diversity along an elevational gradient in Marojejy National Park. Ph.D. thesis, Department of Biological Sciences, University of Cape Town.
4. Nengovhela, A. 2018. 3D cranial morphometry, sensory ecology and climate change in African rodents. Doctor of Philosophy in Anthropobiology, Université de Toulouse III Paul Sabatier.
5. Nomenjanahary, Z. B. 2018. Les oiseaux subfossiles de Tsaramody (Sous-bassin de Samabina-Antsirabe). Mémoire de Master II, Sciences et Technologies, Bassins Sédimentaires Evolution Conservation, Université d'Antananarivo.
6. Ny Hasin'ny Ony, R. 2018. Contribution à la conservation de *Vanilla decaryana* dans la région Androy. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
7. Ralisata, M. 2018. Ecologie de la chauve-souris à ventouse de Madagascar (*Myzopoda aurita*, Milne-Edwards et Grandidier, 1878) dans la forêt de Kianjavato. Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
8. Ramananjato, V. 2018. Rôles et impacts des Microcèbes (*Microcebus* spp.) dans la dissémination des graines des forêts humides de Madagascar. Mémoire de Master II, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
9. Randriamifidisoa, N. R. 2018. Importance et impacts des activités de pêche dans le Complexe des trois lacs de Manambolomaty, Région Melaky, dans la partie ouest de Madagascar. Mémoire de Master II, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.

10. Rakotonirina, S. 2018. Valorisation des bambous dans la zone périphérique du Parc National de Ranomafana. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
11. Ravololoarihanitra, E. M. F. 2018. Possibilités des valorisations et de conservation de *Piper borbonense* de la forêt dense humide de Vohidahy. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.

C) Licence, DEA, Ph.D. diplomas in preparation in direct collaboration with scientific members of Association Vahatra

1. Faliarivola, M. L. In preparation. Analyse du mode de partage des niches écologiques des oiseaux des forêts sèches malgaches. Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
2. Kofoky, A. In preparation. Ecologie des chauves-souris d'Andranomanintsy, Besalampy. Thèse de Doctorat de Troisième Cycle, Département de Biologie Animale, Université de Toliara.
3. Magnina, T. G. In preparation. Contribution à l'étude de la taille du groupe de population de *Propithecus coquereli* pour l'amélioration de l'écotourisme de la forêt d'Anjiamangirana. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
4. Mamialijaona, N. In preparation. Les effets de la reforestation sur la population des lézards dans la région de Kianjavato, Mananjary. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
5. Rahariniaina Mirana, J. E. In preparation. Distribution spatiale et évolution temporelle de la population de *Threskiornis bernieri* dans le Complexe Mahavavy-Kinkony, Nord-ouest de Madagascar. Mémoire de Master, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
6. Rajaonarivelo, J. A. In preparation. Implication des facteurs écologiques sur la répartition verticale de la forêt sèche malgache. Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
7. Rakotonandrasana, A. In preparation. Influence des habitats riverains et des cours d'eau sur la distribution spatiale et la dispersion de *Duttaphrynus melanostictus*. Mémoire de Master II, Institut Supérieur de Sciences, Environnement et Développement Durable, Université de Barikadimy, Toamasina.
8. Ramanatsalama, R. V. In preparation. Dynamique de lapopulation et comportement social de *Rousettus madagascariensis* (Chiroptera : Pteropodidae) dans le Parc National d'Ankarana (Nord de Madagascar). Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
9. Randimbiarison, F. T. In preparation. Réactions comportementales d'*Eulemur rufifrons* aux cris de certaines espèces d'oiseaux dans la forêt de Kirindy. Mémoire de Master, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
10. Randriambololonaritoky, N. A. In preparation. Contribution à l'étude du comportement d'*Hapalemur aureus* dans la forêt de Talatakely (Parc National de Ranomafana). Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
11. Randrianandrasana, F. In preparation. Contribution à l'étude de comportement du *Mantella aurantiaca* en essai de repeuplement à Ambatovy-Analamay. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
12. Rasoanoro, M. In preparation. Etude des parasites sanguins de chauves-souris de la partie orientale de Madagascar. Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
13. Rasolonjatovo, S. M. In preparation. Phylogéographie et génétique des populations de *Mantidactylus bellyi* MOCQUARD, 1895 au niveau de la Montagne d'Ambre, Nord de Madagascar.Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
14. Razaiarisoa, O. In preparation. Les oiseaux aquatiques de la ville d'Antananarivo. Mémoire de Master, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
15. Safidiharizo, A. P. In preparation. Contribution à l'étude de l'adaptation écologique de *Mantella aurantiaca* (Mocquard, 1900) réintroduite dans la zone de conservation d'Ambatovy-Analamay. Mémoire de Licence, Institut des Sciences et Techniques de l'Environnement, Université de Fianarantsoa.
16. Vololona, J. In preparation. Etude des interactions entre *Rousettus madagascariensis* G. Grandidier 1928, (Pteropodidae) et les plantes vasculaires du Parc National d'Ankarana par des analyses polliniques. Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.

VAHATRA MEMBERS AS REVIEWERS OF PAPERS SUBMITTED TO SCIENTIFIC JOURNALS

As an indication of the role Association Vahatra scientists play in the realm of published scientific papers, they served in 2018 as reviewers for papers submitted to the following international journals:

- *Acta Chiropterologica*
- *Acta Tropica*
- *Journal of Quaternary Science*
- *Journal of Raptor Research*
- *Madagascar Development & Conservation*
- *Malagasy Nature*
- *Mammalia*

- *Nature*
- *PLoS One*
- *Remote Sensing in Ecology and Conservation*
- *Science*
- *Zootaxa*

MALAGASY NATURE

Our intention with the scientific journal *Malagasy Nature*, which is published by Association Vahatra, is to advance peer-reviewed papers of high scientific and technical standards. As the review has an ISSN number, it is considered an international scientific journal. Manuscripts in French or English are passed through an editorial team, including a review process of international norms. We work closely with Malagasy authors, particularly graduate students and young researchers, to help them understand the process of composing, writing, and editing scientific articles.

In many cases, the first publication of a researcher poses considerable hurdles and *Malagasy Nature* provides the means for these individuals to negotiate such problems. Based on this approach, this outlet plays an important role in regional capacity building, which in turn separates it from other international journals, for which the editors and associated editorial committee are not readily available to help with initial manuscript submission and revisions. Further, the journal allows Malagasy scientists to return information to the worldwide scientific world. All of these aspects together, provide professional advancement for the Malagasy scientific community, specifically a certain sense of responsibility and for national authors to understand the importance of invested efforts when producing scientific articles. The manner the journal is published also guarantees the local availability of research results in the fields of ecology and biology conducted on Madagascar and neighboring islands, as compared to foreign scientific journals with copies or electronic files not readily downloadable or repatriated to Madagascar. All recent numbers of the journal are available on line and with free access (http://www.vahatra.mg/malagasynaturefr.html).

Marie Jeanne Raherilalao and Steven M. Goodman are the Editors of *Malagasy Nature* and a group of Associated Editors assists in different aspects with submitted manuscripts. We attempt to publish at least one volume of the journal each year. At least in part with the enormous task of finishing the

protected area book (see section on this subject below), the 2018 volume will come out early in 2019.

The editorial board of *Malagasy Nature* is composed of both national and international scientists, from the Anglophone and Francophone worlds, made up of the following individuals:

Editors

Marie Jeanne Raherilalao
Steven M. Goodman

Associated editors

Achille P. Raselimanana
Malalarisoa Razafimpahanana
Voahangy Soarimalala

Editorial committee

Birds
Frank Hawkins
Olivier Langrand

Mammals
Jean-Marc Duplantier
Jörg U. Ganzhorn
Peter J. Taylor
Daniel Rakotondravony
Beza Ramasindrazana
Manuel Ruedi

Entomology
Henri-Pierre Aberlenc
Brian Fisher

Reptiles/Amphibians
Franco Andreone
Miguel Vences

Crustaceans/Fish
Jeanne Rasamy
Melanie Stiassny

Parasitology
Vincent Robert

Plants
Christopher Birkinshaw
Roger Edmond
Joelisoa Ratsirarson

History/Archeology
Chantal Radimilahy
Henry Wright

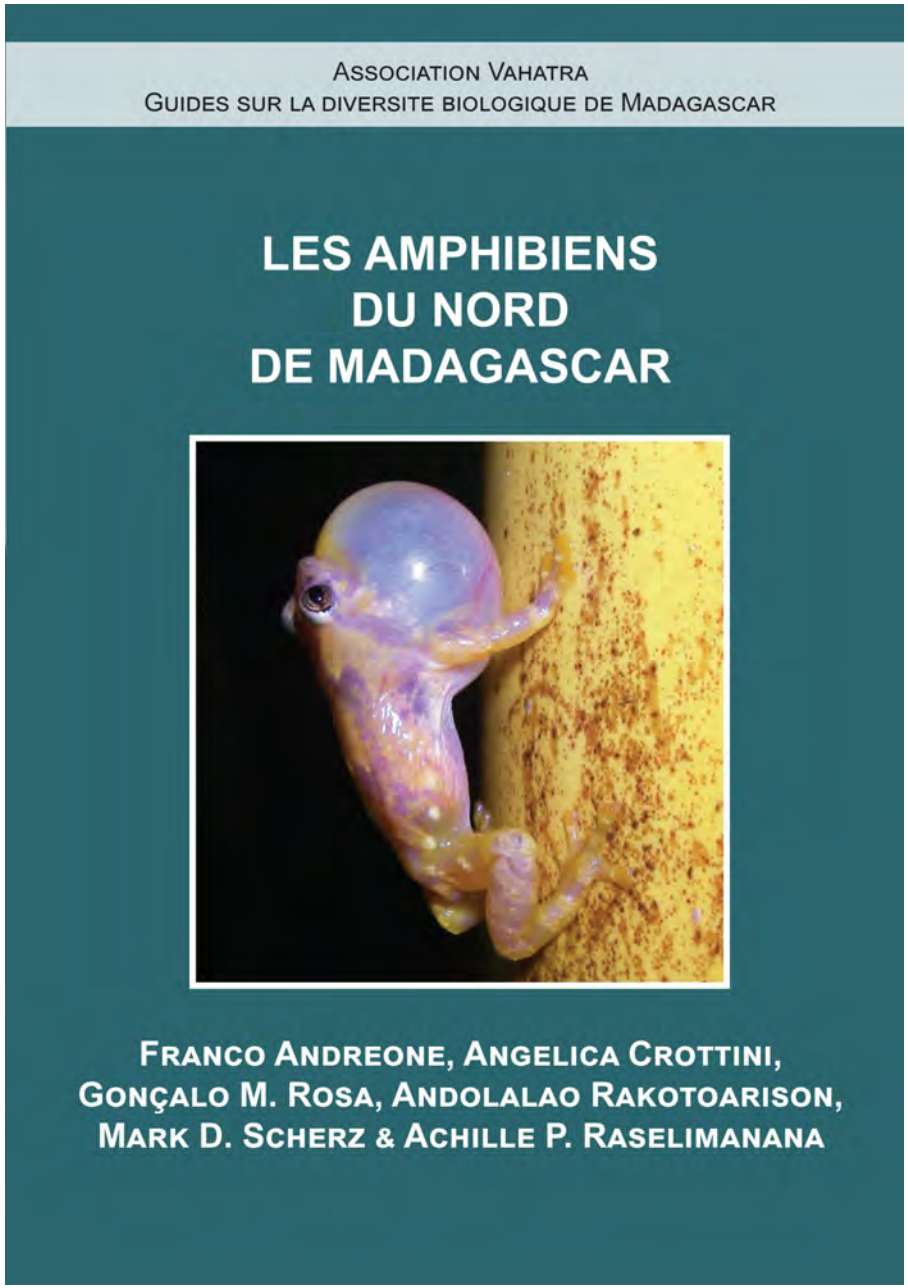
Paleontology
David Burney
John Flynn

THE PUBLISHING HOUSE OF ASSOCIATION VAHATRA

The year 2011 marked an important advancement for Association Vahatra with the creation of its own publishing house, focusing on a series entitled "Guides sur la diversité biologique de Madagascar" [Guides to the biological diversity of Madagascar]. For individuals that have grown up over the past 40 years in, for example, North America, portions of Latin America or western Europe, information on regional plants and animals are readily available in field guide format. These types of books, generally presented by taxonomic group (e.g. ferns, reptiles, birds, etc.) and region, revolutionized making information on biodiversity available and penetrable for members of different age and social groups in many various regions of the world. Such guides provide the means for individuals to become familiar with different plants and animals found in areas where they live or travel, and, most critically, integrating this familiarity into how they conceive the importance of the natural world. It is not an exaggeration to state that this type of guides have led to the "greening" of different sectors of society in numerous countries. For Madagascar, which is so rich in biological diversity and being one of the principal conservation priorities in the tropics, the previous lack of such books created a considerable void, which Association Vahatra strongly believes needed to be filled.

Since 2011, seven books have been published in the series, which is edited by Marie Jeanne Raherilalao and Steven M. Goodman and designed and typeset by Madame Malalarisoa Razafimpahanana:

1. *Les chauves-souris de Madagascar* [The bats of Madagascar] by Steven M. Goodman, 2011, 129 pp.
2. *Les petits mammifères de Madagascar* [The small mammals of Madagascar] by Voahangy Soarimalala & Steven M. Goodman, 2011, 176 pp.
3. *Histoire naturelle des familles et sous-familles endémiques d'oiseaux de Madagascar* [The natural history of the families and subfamilies of endemic Malagasy birds] by Marie Jeanne Raherilalao & Steven M. Goodman, 2011, 146 pp.
4. *Les Carnivora de Madagascar* [The Carnivora of Madagascar] by Steven M. Goodman, 2012, 158 pp.



5. *Les animaux et écosystemes de l'Holocène disparus de Madagascar* [The extinct Holocene animals and ecosystems of Madagascar] by Steven M. Goodman & William L. Jungers, 2013, 249 pp.
6. *Les amphibiens des zones arides de l'Ouest et du Sud de Madagascar* [The dry forest amphibians of western and southwestern of Madagascar] by Franco Andreone, Gonçalo M. Rosa & Achille P. Raselimanana, 2014, 180 pp.
7. *Les amphibiens du Nord de Madagascar* [*The amphibians of northern Madagascar*] by Franco Andreone, Angelica Crottini, Gonçalo M. Rosa, Andolalao Rakotoarison, Mark D. Scherz & Achille P. Raselimanana, 2018, 355 pp.

The production of the first three books in the series was financed by a grant from the Critical Ecosystem Partnership Fund (CEPF). Subsequently, a generous grant from the Ellis Goodman Family Foundation allowed additional guides in the series to be published. Additional volumes to be published in the series over the next year and graciously subsidized by the Ellis Goodman Family Foundation and Paul Goodman include:

1. *The ant genera of Madagascar* – by Brian Fisher & Christian Peeters. This bilingual French-English book is at the stage of printing and will be presented in early 2019.
2. *The damselflies and dragonflies of Madagascar* - by K. D. Dijkstra & Callen Cohen. This bilingual French-English book is anticipated in 2019.

To date, other than free or at production costs diffusion of Vahatra Press books to Malagasy students and scientists, numerous copies have been sold to people coming to the Vahatra office, at different fairs in Antananarivo, and through overseas booksellers. We are pleased with the interest these books have generated, which includes seeing young Malagasy students and naturalists carrying and consulting the books on field trips to different forested areas. Further, these books are important resources for national students and researchers, as well as reference works for different university courses. The University of Chicago Press is now responsible for the distribution of books in this series in North America and Europe, as well as the *Atlas of selected vertebrates of Madagascar* published in late 2013 (see http://www.press.uchicago.edu/ucp/books/publisher/pu3431914_3431915.html).

CURRENT VAHATRA PROJECTS AND GRANTS

The association is involved in a number of collaborative projects and below are details on some of these.

1. Helmsley Charitable Trust – capacity building, phase II

This project, entitled "Development of scientific capacity for Malagasy conservation biologists", commenced in January 2017. The project has four different aspects: 1) field schools each year focusing on young Malagasy graduate student to help in their scientific orientation and skill development; the participant groups will also include some individuals working in protected areas management (e.g. Madagascar National Parks) and field practitioners for conservation organizations (most selected from other HCT financed projects); 2) field studies and different forms of mentoring for four PhD students and Master's II students enrolled at The University of Antananarivo; 3) continued advancement of scientific and general publications associated with Vahatra scientists and students, as well as the Malagasy scientific community, and 4) the publication of a large-scale synthesis on the protected areas of Madagascar (see below, "New protected areas book").

2. Helmsley Charitable Trust – invasive species in collaboration with Island Conservation

In the context of creating connectivity projects between organizations receiving funding from the Helmsley Charitable Trust, Island Conservation in collaboration with Association Vahatra received a grant to advance different research projects and public education associated with problems imposed on Madagascar's ecosystems and the Malagasy people by invasive animal species.

Some of the results to date associated with this project include a monograph published in early 2017 in *Malagasy Nature* (http://www.vahatra.mg/volume11.html) on multidisciplinary biological inventories conducted on islands in the Nosy Ankao archipelago, northeastern Madagascar. A follow-up project associated with this work is in advanced stages of development to remove rats from one of these islands, Nosy Manampao, where a large breeding colony of terns occurs.

During the tern breeding season of 2018 (July and August), a study group was assembled to conduct different forms of fieldwork on Nosy Manampao associated with tern monitoring and different aspects of the proposed rat removal project. This was conducted in collaboration with different colleagues from Madagascar and La Réunion Island. Also, the different activities were used for training of individuals from Time and Tide Foundation and Fanamby, both organizations responsible for the management of islands in the Nosy Ankao archipelago.

In association with this project, Toky Randriamoria followed at the Durrell Wildlife Conservation Trust on Mauritius a Post Graduate Diploma in Endangered Species Conservation Management in 2017. Further, numerous other field projects on invasive species, including those associated with Master's students at the Université de Toamasina and different field projects of Vahatra scientists, have been completed.These include studies on the ecology and distribution of the introduced Asian toad *Duttaphrynus melanostictus*, density estimates of introduced House Sparrows *Passer domesticus* in the cities of Toamasina and Fénérive-Est, and breeding ecology and population structure of House Sparrows in Antsiranana.

3. Critical Ecosystem Partnership Fund (CEPF) – book on the protected areas of Madagascar

In late 2015, Association Vahatra received a three-year grant from CEPF to conduct a large-scale review of the protected areas system of Madagascar. The project includes a bilingual book on this subject, which was published by Association Vahatra in late 2018 (see below, "New protected areas book").

4. Critical Ecosystem Partnership Fund (CEPF) – regional capacity building project

In the latter portion of 2017, the Critical Ecosystem Partnership Fund gave a three-year grant for a project entitled "Developing Indian Ocean Capacity for Conservation through Training and Exchange". This program is under the principal direction of Durrell Conservation Training Ltd (DCT), Mauritius, with partnerships with Association Vahatra and the Mauritian Wildlife Foundation. The project is organized in three different sessions, a portion of each on Madagascar and the balance on Mauritius and the 15 or so participants for each session are chosen based on a written application and interviews. Applications are open to people holding posts in the private sector in the domain of conservation and from Madagascar, Mauritius, the Seychelles, and the Union of the Comoros.

The short-term impact of the project is advance regional capacity to conserve biodiversity through measurable change at the level of individuals trained during this project. From the Association Vahatra side, two different

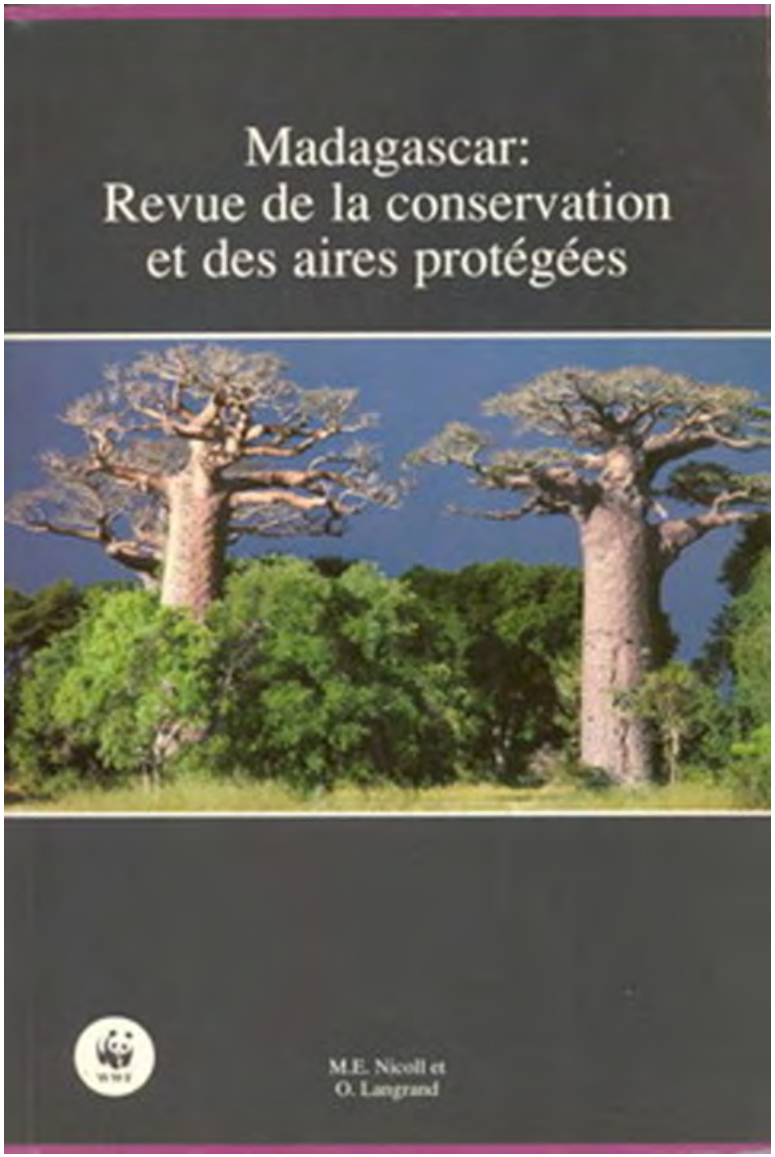
types of interventions are accomplishing this aspect. First, a week of lectures given to the participants at the Antananarivo office and covering a wide range of topics including *in situ* and *ex situ* conservation, the positive and not so positive aspects of different conservation projects on the island, the complexity of certain conservation projects, aspects of using scientific knowledge to advance projects, etc. The second aspect is the participants taking part in a 12-day field school associated with biological inventories and the multi-faceted aspects of scientific research and the use of such data for advancing conservation.The site these field schools are being conducted is the Réserve Spéciale d'Ambohitantely, a few hours drive from Antananarivo. During this activity, the participants are actively engaged in the capture and censusing of different inverterbrates, vertebrates and plants, and a range of activities. A series of early afternoon daily lectures bring together the practical aspects of their "retooling" and the manner these scientific activities are critical for the advancement of research and their application to conservation. The long-term aspect is to improve at the level of western Indian Ocean islands the management and conservation of ecosystems and species. An outdoor open sided "chalet" was constructed that served as the lecture, eating space, and social site during the field school. This structure will be available for other research groups and tourists visiting Ambohitantely.

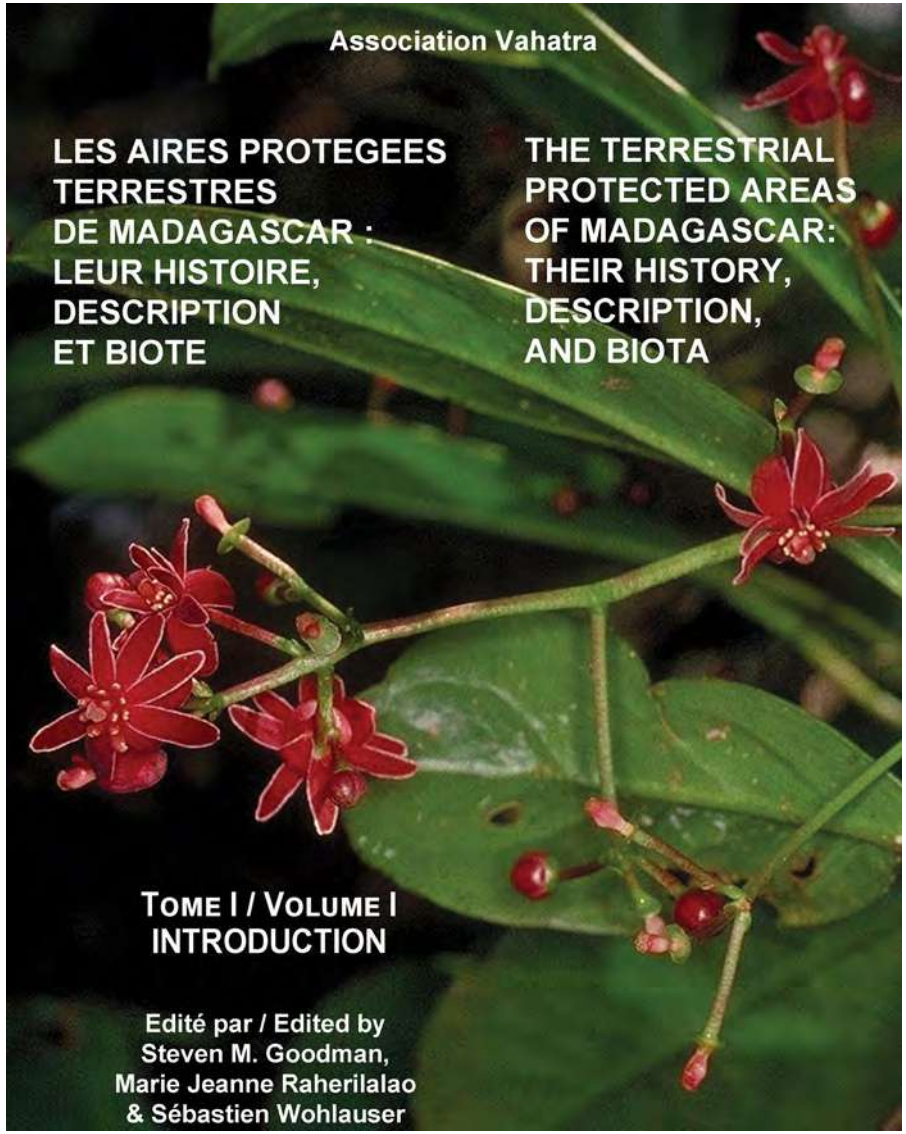
NEW PROTECTED AREAS BOOK

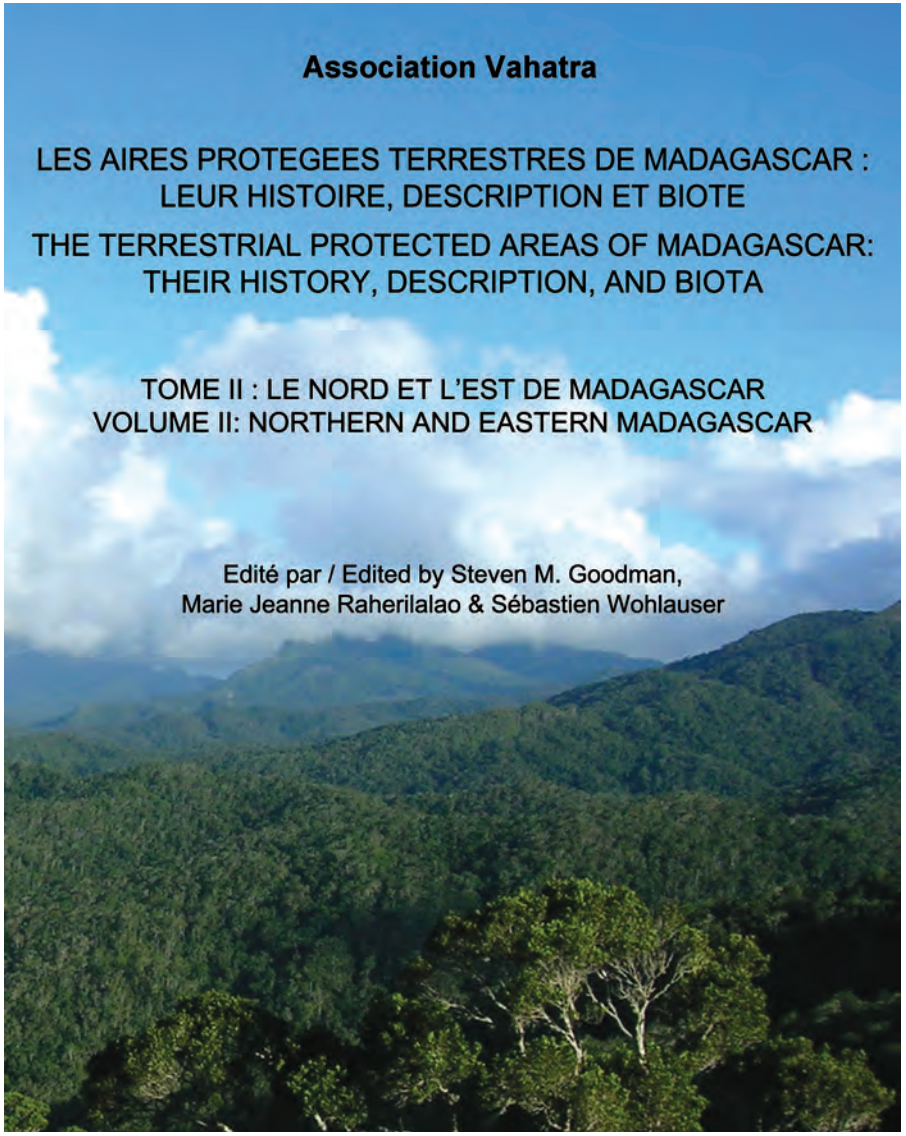
In 1989, Martin Nicoll and Olivier Langrand published a book entitled "*Madagascar: Revue de la conservation et des aires protégées*" (WWF, Gland), an important landmark in the early recent development of Madagascar's protected area. In a clear and succinct manner, these authors compiled information, including vertebrate species lists, available at that time for each site, and important sections on the future strategies to conserve the remaining natural habitats of the island. Since then, that is to say over slightly less than three decades, the biological exploration of the remaining forests of the island has advanced considerably, changes have taken place in our knowledge of the fauna and the flora, including the description of several thousand new species to science, and many new protected areas have been established. As is the nature with such syntheses and a sign of advancement, the Nicoll and Langrand book is now out of date and in need of revision.

With a grant from CEPF, Association Vahatra in collaboration with the Field Museum, Fondation pour les Aires Protégées et la Biodiversité de Madagascar (FAPBM), and numerous other organizations, including Madagascar National Parks, has undertaken a project to revise and expand the Nicoll & Langrand book. This three-year project involves many different facets, including a tabulation of the recognized terrestrial protected areas as of mid-May 2015; scanning and organizing an estimated 12,000-15,000 documents concerning the biota occurring at these sites and associated legal documents to be posted for free access on a forthcoming website; a large-scale review and updating of a database of the vertebrates and plants of each site; systematic reviews of the different groups to be covered in the project; biological inventories of poorly known sites; and numerous other activities.

The bilingual (French-English) book edited by Steven M. Goodman, Marie Jeanne Raherilalao, and Sébastien Wohlhauser and entitled "*Les aires protégées terrestres de Madagascar : leur histoire, descriptions et biotes* / *The terrestrial protected areas of Madagascar: their history, descriptions and biota*" was published in late 2018 by Association Vahatra. The book, which is in three volumes, contains 1716 pages, over 800 color images, several hundred maps, and close to 400 tables. The first volume (424 pages) is the introduction to a wide range of different subjects and contains 16 different chapters; the second volume (808 pages) covers protected areas of the eastern portion of the island; and the third volume (483 pages) deals




Association Vahatra
LES AIRES PROTEGEES TERRESTRES DE MADAGASCAR : LEUR HISTOIRE, DESCRIPTION ET BIOTE
THE TERRESTRIAL PROTECTED AREAS OF MADAGASCAR: THEIR HISTORY, DESCRIPTION, AND BIOTA
TOME I / VOLUME I
INTRODUCTION
Edité par / Edited by
Steven M. Goodman,
Marie Jeanne Raherilalao
& Sébastien Wohlauser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LES AIRES PROTEGEES TERRESTRES DE MADAGASCAR : LEUR HISTOIRE, DESCRIPTION ET BIOTE
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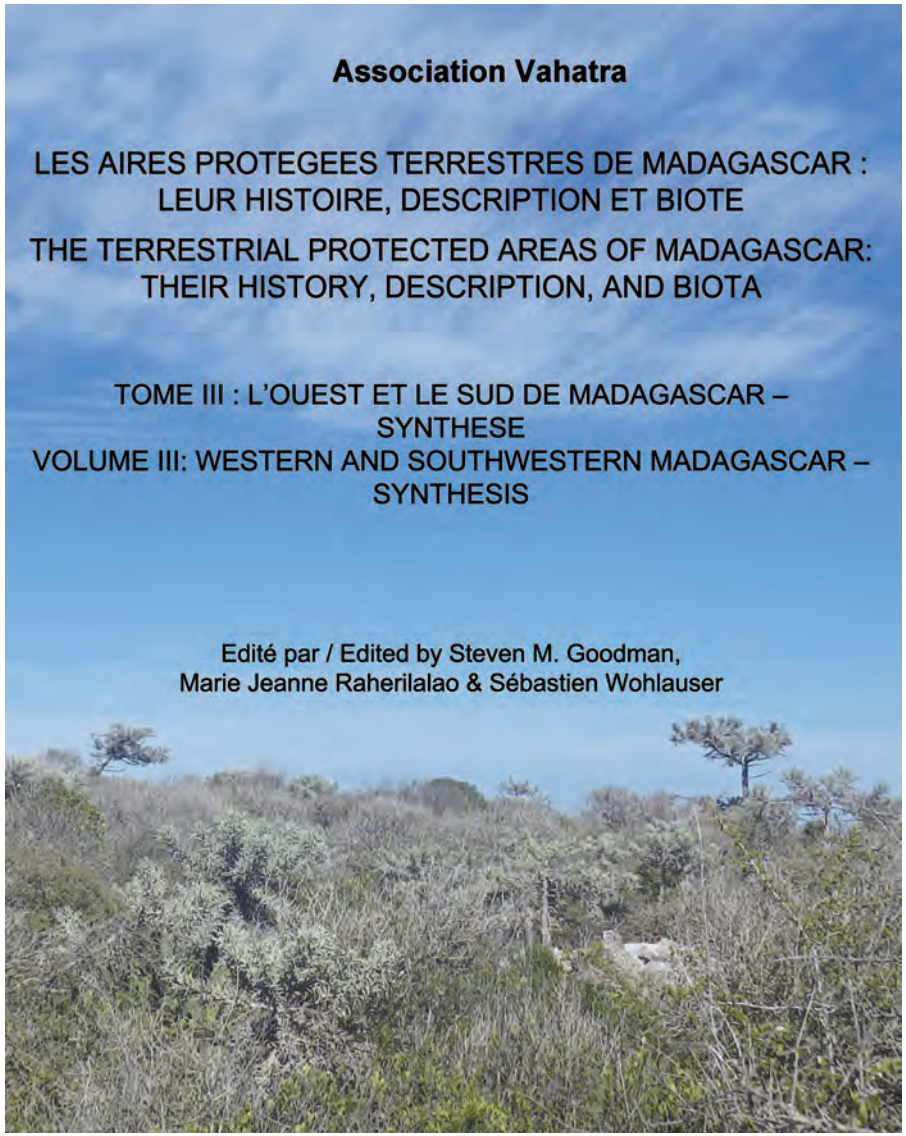
VOLUME II: NORTHERN AND EASTERN MADAGASCAR
Edité par / Edited by Steven M. Goodman,
Marie Jeanne Raherilalao & Sébastien Wohlauser



with sites in the west. It is our hope that this book will be of beneficial use to different protected area managers, provide a major boost and incentive for different forms of national and international ecotourists visiting the island's protected areas, and form an important reference for biologists and students working in different domains touching conservation biology.

A range of different activities are planned for early 2019 to promote the book, including the formal presentation on 1 March at the Université d'Antananarivo to the Malagasy conservation and scientific community; a public presentation on the book project at the l'Institut Français de Madagascar in Antananarivo on 9 March; lots of different publicity, such as an article in the Air Madagascar in flight magazine, *Prime*, coinciding with the different March events; and the presentation of the book at the Field Museum of Natural History in Chicago on 4 June.

PERSON IN FOCUS: PROFESSOR TITULAIRE ACHILLE P. RASELIMANANA

On 16 February 2018, the President of Association Vahatra, Dr. Achille P. Raselimanana, was named at an award ceremony held at the University of Fianarantsoa, as "professeur titulaire" or "full professor". This is the

highest academic designation awarded to a professor who has demonstrated excellence in research and teaching. Evaluations are carried out by a national university scientific research commission and is based on dozens of criteria, including the candidate's achievement in terms of research and publications, teaching and mentoring, and training. The acquisition of this degree allows the Professor to take the role of a thesis director, to be the president of a thesis defense, and to take on other responsibilities within the university without restrictions. This statute also provides after death of the person for a full mortuary service at the university associated with "lifting of the body". We send our congratulations to Achille for this important accomplishment, which he so rightfully deserves

56TH ANNUAL MEETING OF THE ASSOCIATION TROPICAL BIOLOGY AND CONSERVATION

Madagascar has been chosen to host the next meeting of the Association of Tropical Biology and Conservation, which will be held in Antananarivo from 30 July to 3 August. It is anticipated that at least 600 people from all corners of the planet will attend. The meeting will be held at the Ivato Conference Center, a short distance from the Ivato airport. For further information on the conference, please see https://atbc2019.org/venue.html

Association Vahatra is one of the local supporting organizations and with different members taking different roles: Achille Raselimanana is a member of the scientific committee and Steve Goodman is the co-chair of the academic component. Steve will also be presenting a plenary lecture during the conference. Association Vahatra is making competitive grants available to Malagasy graduate students, professors, and researchers to take part in the meeting.

ACTIVITIES OF VAHATRA PERMANENT MEMBERS DURING 2018

Members of the Vahatra scientific staff were involved in a variety of activities, aspects of which are summarized below on a monthly basis.

January

Achille was rather busy teaching and supervising field activities associated with a *Mantella aurantiaca* restocking project in collaboration with the NGO Mitsinjo (specialist in captive breeding), Ambatovy (source of financial support), and the Mention Zoology and Animal Biodiversity. He also was involved in the design of Master's topics for two students from the University of Fianarantsoa, involved in this same restocking program. He assisted with an internal regulations report within the Faculty of Sciences of the University of Antananarivo. Voahangy worked on an article associated with rat problems on Madagascar, activities carried out under a previously funded project known as Stoprats. She also cataloged reference specimens for the University of Antananarivo collection and taught at the University of Fianarantsoa. Jeanne was busy with exams at the University of Antananarivo. She and Steve also participated in the review commission of four DEA memoirs of students of the Higher Institute of Sciences, Environment and Sustainable Development (ISSEDD) of the University of Barikadimy, Toamasina and took part as committee members of these memories. These memoirs were produced as part of the Vahatra Association and Island Conservation Project on Invasive Species, funded by Leona B. & Harry B. Helmsley Charitable Trust. Steve, together with Marie Jeanne and Sébastien Wohlhauser, devoted considerable portions of the month, as well as the balance of the year, in writing and editing a book on the protected areas of Madagascar.

February

Achille worked on the book "Guide des amphibiens du Nord de Madagascar" with the other authors, as well as making some corrections and revisions on portions of the protected area book concerning reptiles and amphibians. He also presided over the presentation of a Master's II memoir. During the course of the month, he attended a ceremony at the University of Fianarantsoa to become a full and titled professor; this is an important and high honor. Achille was the thesis supervisor of a student working on bats, and together with Steve, took part as committee members in the thesis presentation of the jury of this one. Voahangy worked on an article concerning tenrec conservation, as well as some follow-up work with students involved in the *Mantella aurantiaca* restocking project at Ambatovy. Then she is part of the jury of two memoirs she has framed. She is also busy with teaching activities and different administrative advancements at the University of Fianarantsoa.

Steve and Marie Jeanne worked on different aspects of the protected areas book. They also spent time editing a guide to the ants of Madagascar.

March

Achille was rather occupied during the month with teaching activities, as well as different aspects of finalization of different student thesis projects. He, together with Toky Randriamoria, a post-doc at Association Vahatra, As part of the implementation of a project funded by CEPF, he participated in a workshop organized by the Durrell Wildlife Conservation Trust (Mauritius) and methodological aspects of capacity building for regional scientists and field workers working in conservation. Voahangy was rather preoccupied with organizing a field school on Madagascar in the month of April associated with a CEPF project with Durrell Wildlife Conservation Trust and Mauritius Wildlife Foundation. Both Marie Jeanne and Steve worked on the first stages of finalizing the book "Guide des amphibiens du Nord de Madagascar", as well as different aspects of the protected areas book. The two also edited articles submitted for publication to *Malagasy Nature*. Voahangy also resumed teaching activities at the University of Fianarantsoa. Steve was also engaged as co-coordinator for scientific aspects of the Association of Tropical Biology and Conservation meeting that will be held in Antananarivo in late July-early August 2019.This meeting is anticipated to be rather large, perhaps with over 600 attending participants and coming from many different countries (see earlier text "56th annual meeting of the Association Tropical Biology and Conservation"). Steve also made a presentation at the 6th African Network for Influenza Surveillance and Epidemiology (ANISE) meeting held in Antananarivo under the title, "The biodiversity of Madagascar: endemism, introductions and zoonotic diseases".

April

The month started with the arrival in Antananarivo of 15 individuals from the Malagasy Region (Madagascar, Mauritius, Seychelles, and Union of the Comoros), to take part in a week of course work in Antananarivo and 13 days of field training in Ambohitantely concerning biological inventories. Achille, Marie Jeanne, Steve, and Voahangy took part in these activities (see earlier text "New protected areas book" describing the project), aimed to increase the capacity of young professionals working in different domains associated with management, monitoring and conservation of biodiversity. This was the

first of three planned field schools associated with the Madagascar portion of the project. In collaboration with the NGO, Biodiversity Conservation Madagascar, Achille and Steve participated in the design and preparation of the Aldabra tortoise reintroduction project at Ambinda, in the central western part of Madagascar. Several Ph.D. students from Association Vahatra made presentations on their thesis research at the Malagasy Academy (Académie Malgache), and Marie Jeanne and Steve attended the lecture series.

May

Achille continued his teaching activities at the University of Antananarivo. He also worked on some scientific papers and aspects of the protected area book, as well as the finalization of a thesis before being submitted to the evaluation commission. Achille, Voahangy, and Steve developed a proposal for UNESCO associated with research in several national UNESCO Biosphere and World Heritage sites. Voahangy was among the panelists to explain the types of biodiversity information available at Vahatra during the workshop organized by the Association of Environmental Information Systems Network (ARSIE). Voahangy and Marie Jeanne continued their teaching activities at the University of Fianarantsoa and the University of Antananarivo, respectively. Marie Jeanne and Steve continued to work on the "Guide des amphibiens du Nord de Madagascar" and the protected area

book. Steve gave a lecture to national ecotouristic guides on the biodiversity of Madagascar.

June

Achille was part of the jury of a Master's II memoir and spent a good portion of the month organizing biannual exams at the University of Antananarivo and different aspects of preparing the associated texts to prepare for the exams to take place before the start of the next academic year in August. A workshop on funding for Ph.D. student research projects was organized at Vahatra in collaboration with Lova Marline, a Malagasy researcher working in South Africa; Students from the University of Antananarivo participated in this information session. Voahangy supervised students associated with memoir projects on the repopulation of *Mantella aurantiaca*. She also devoted considerable time in translating from French into English a database associated with the Stoprats project. In addition, Voahangy elaborated a research proposal, in collaboration with Madagascar National Parks, for forest habitat restoration in three parks (Masoala, Ranomafana and Andohahela). Jeanne led students from the Faculty of Science, University of Antananarivo, to Andasibe National Park for a study tour. Steve left in the first portion of the month for his annual northern summer visit to the Field Museum, and together with Marie Jeanne entered the final stages of putting together the protected area book.

July

Achille, outside of his teaching activities, helped prepare aspects of the biannual University of Antananarivo exams, and worked on the final touches on the "Guide des amphibiens du Nord de Madagascar", anticipated to be released before the end of the year. He also carried out a field trip to supervise the progress of the restocking of *Mantella aurantiaca* in the Ambatovy mining project conservation area; the subject of a Ph.D. student's thesis project. Voahangy was a jury member for two different "Licence" memoirs. She continued to develop the terms of reference for the restoration project in collaboration with Madagascar National Parks. She was also involved in the development of a research proposal on a palm plantation project south of Toamasina in collaboration with Proforest. Steve and Marie Jeanne continued to work intensively on the protected area book. He was also actively involved in different aspects of fund raising, specifically for the protected area book.

August

Achille continued with his teaching activities at the University of Antananarivo and serve on the jury of a Master's II memoir. He closely followed the advancements of three Ph.D. students, two of whom are affiliated with Association Vahatra. He also participated in a workshop on the issuing of scientific research permits, specifically administrative aspects, which was organized by the IUCN Amphibian Specialist Group and the Direction Générale des Ressources Naturelles, following requests of national researchers and biodiversity research institutions. Voahangy was a jury member of two "Licence" memoirs presented at the University of Fianarantsoa. She also carried out in collaboration with the Pasteur Institute of Madagascar field research on the small mammals of Ambohitantely. Steve and Jeanne continued the intensive stages of finalizing the protected areas book, as well as guides on amphibians of northern Madagascar and another on the ants of Madagascar. Marie Jeanne also participated in the 27th International Ornithological Congress in Vancouver, Canada. Steve conducted research at the Field Museum with colleagues associated with a portion of the subfossils collected at a cave in western Madagascar. Towards the end of the month he returned to Madagascar.

September

Achille presided over a Master's II presentation at the University of Antananarivo and continued supervising other graduate students. He also participated in the preparation workshop for the 6th National Report of the Convention on Biological Diversity; scientists at Association Vahatra are always involved in the preparation of this report. He has also been involved in organizing the COMATSA Biological Inventory Expedition Team in collaboration with Duke University researchers. Association Vahatra organized with Marina Blanco and Lydia Greene a two-day training workshop for students on the extraction and sequencing of DNA using a mobile laboratory. Voahangy and Achille attended a series of research presentations of "Licence" students working on *Mantella aurantiaca* restocking activities in the Ambatovy mining project conservation area. They also participated in the workshop organized by the Protected Area System Directorate on exchanges between researchers and administrative staff to improve the system of granting the research permits. Voahangy was also involved in the preparation of the biological assessment mission south of Toamasina. Steve and Jeanne worked on reading proofs for the protected areas book. Steve was also actively involved in the preparation of the Association of Tropical Biology and Conservation meeting to be held in Antananarivo in 2019 and took part in a thesis committee meeting of a student at the University of La Réunion.

October

Achille spent a good portion of the month teaching and supervising Master's II students at the University of Antananarivo. Together with Marie Jeanne and Voahangy, a short biological inventory mission was carried out to eastern Madagascar, south of Toamasina, associated with the possible extension of a palm plantation. These three scientists also worked on the report associated with Toamasina fieldwork, and a report for a forest restoration project in collaboration with Madagascar National Parks. Voahangy and Steve were also preoccupied with organizing a field school on Madagascar in November associated with a CEPF project, together with Durrell Wildlife Conservation Trust and Mauritius Wildlife Foundation. Marie Jeanne was occupied with teaching at the University of Antananarivo, as well as advising different graduate students. Steve together with a Ph.D. student working with Association Vahatra conducted fieldwork in the caves of Ankarana. He also participated as a jury member in a Ph.D: presentation at the University of Toliara and a CEPF workshop held in Antananarivo. The final page proofs of the protected area book were sent to the printing house on Mauritius.

November

Achille, Marie Jeanne, Steve, and Voahangy, organized course work in Antananarivo and field training at Ambohitantely for 12 individuals originating from the Malagasy Region (Madagascar and Seychelles). This project aims to increase the capacity of young professionals working in different domains associated with management, monitoring and conservation of biodiversity (see earlier text "Critical Ecosystem Partnership Fund (CEPF) -- regional capacity building project" describing the project). This was the second of three planned field schools associated with the Madagascar portion of the project. These four Vahatra scientists carried out an evaluation of the research carried out by the Biotope team in the Sahofika region, Ambatolampy, as part of the impact studies on the dam construction project. This month also saw the presentation of a new book published by Association Vahatra and entitled, "Guide des amphibiens du Nord de Madagascar", for which Achille is one of the co-authors. He also participated in a workshop updating the

management and conservation action plan for *Mantella cowani*, a Critically Endangered amphibian, which was organized at Ambositra by the IUCN Amphibian Specialist Group. All four Association Vahatra were involved in different teaching and mentoring activities with Malagasy graduate students. Voahangy also participated in the drafting of the 6th National Report of the Convention on Biological Diversity.

December

The first portion of the month was devoted to fieldwork. Achille, Marie Jeanne, and Voahangy made a quick expedition to the Masoala National Park to design and implement an ecological restoration strategy and monitoring system in the area impacted by the exploitation of rosewood. It is a logical continuation of the activities of the Association Vahatra on behalf of Madagascar National Park in the framework of the "Project of Evaluation of the Universal and Exceptional Values of the World Heritage Site" in 2016. Steve left for the north together with a colleague from the Field Museum to capture a considerable number of individuals of the introduced and invasive House Sparrows associated with a genetic study. Just before the holidays Steve traveled to Toulouse as a jury member for a Ph.D. presentation.

NEW SPECIES OF ANIMALS DESCRIBED IN 2018 BY VAHATRA SCIENTISTS

One of the direct results of the biological inventories conducted by Vahatra and associated collected specimens, is the discovery of species previously unknown to science. Vahatra scientists described this past year one new species of bird from Madagascar.

1. *Newtonia lavarambo* -- Younger, J. L., Strozier, L., Maddox, J. D., Nyári, Á. S., Bonfitto, M. T., Raherilalao, M. J., Goodman, S. M., Reddy, S. 2018. Hidden diversity of forest birds in Madagascar revealed using integrative taxonomy. *Molecular Phylogenetics and Evolution*, 124: 16-26.

SCIENTIFIC OUTPUTS OF VAHATRA DURING 2018

Publications from 2018, including in press and submitted manuscripts. Names in **bold** are those of scientific members and a research associate of Vahatra and those in *italics* are current or past (including several different generations) Malagasy student members working with Association Vahatra.

1. Crowley, B. E., Castro, I., Soarimalala, V. & Goodman, S. M. 2018. Isotopic evidence for niche partitioning and the influence of anthropogenic disturbance on endemic and introduced rodents in central Madagascar. *The Science of Nature*, 105: 44. https://doi.org/10.1007/s00114-018-1564-y.
2. Dietrich, M., Gomard, Y., Lagadec, E., Ramasindrazana, B., Le Minter, G., Guernier, V., Benlali, A.,Rocamora, G., Markotter, W., **Goodman, S. M.**, Dellagi, K. & Tortosa, P. 2018. Biogeography of *Leptospira* in wild animal communities inhabiting the insular ecosystem of the western Indian Ocean islands and neighboring Africa. *Molecular Ecology*, 7: 57.
3. Everson, K. M., Hildebrandt, K. B. P., **Goodman, S. M.** & Olson, L. E. 2018. Caught in the act: incipient speciation across a latitudinal gradient in a semifossorial mammal from Madagascar, the mole tenrec *Oryzorictes hova* (Tenrecidae). *Molecular Phylogenetics and Evolution*, 126: 74-84.
4. Fernández, P. J., Mongle, C. S., Leakey, L., Proctor, D. J., Orr, C. M., Patel, B. A., Almécija, S., Tocheri, M. W. & **Jungers, W. L.** 2018..Evolution and function of the hominin forefoot. Proceedings of the National Academy of Sciences, 115: 8746-8751.
5. Glaw, F. & **Raselimanana, A. P.** 2018. Systématique des reptiles terrestres malgaches (ordres : Squamata, Testudines et Crocodylia). / Systematics of terrestrial Malagasy reptiles (orders Squamata, Testudines, and Crocodylia). In *Les aires protégées terrestres de Madagascar : leur histoire, description et biote / The terrestrial protected areas of Madagascar: their history, description, and biota*, eds. **S. M. Goodman**, **M. J. Raherilalao** & S. Wohlhauser, pp. 289-327. Association Vahatra, Antananarivo.
6. **Goodman, S. M.** & **Raherilalao, M. J.** 2018. Systématique des oiseaux malgaches. / Systematics of Malagasy birds. Systématique des reptiles terrestres malgaches (ordres : Squamata, Testudines et Crocodylia). In *Les aires protégées terrestres de Madagascar : leur histoire, description et biote / The terrestrial protected areas of Madagascar: their history, description, and biota*, eds. **S. M. Goodman**, **M. J. Raherilalao** & S. Wohlhauser, pp. 329-361. Association Vahatra, Antananarivo.
7. **Goodman, S. M.** & *Ramasindrazana, B.*2018. Systématique des chauves-souris malgaches (ordre des Chiroptera). / Systematics of Malagasy bats (order Chiroptera). In *Les aires protégées terrestres de Madagascar : leur histoire, description et biote / The terrestrial protected areas of Madagascar: their history, description, and biota*, eds. **S. M. Goodman**, **M. J. Raherilalao** & S. Wohlhauser, pp. 383-394. Association Vahatra, Antananarivo.
8. **Goodman, S. M.** & **Soarimalala, V.** 2018. Systématique des rongeurs endémiques malgaches (famille des Nesomyidae : sous-famille des Nesomyinae). / Systematics of endemic Malagasy rodents (family Nesomyidae: subfamily Nesomyinae) In *Les aires protégées terrestres de Madagascar : leur histoire, description et biote / The terrestrial protected areas of Madagascar: their history, description, and biota*, eds. **S. M. Goodman**, **M. J. Raherilalao** & S. Wohlhauser, pp. 373-381. Association Vahatra, Antananarivo.
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