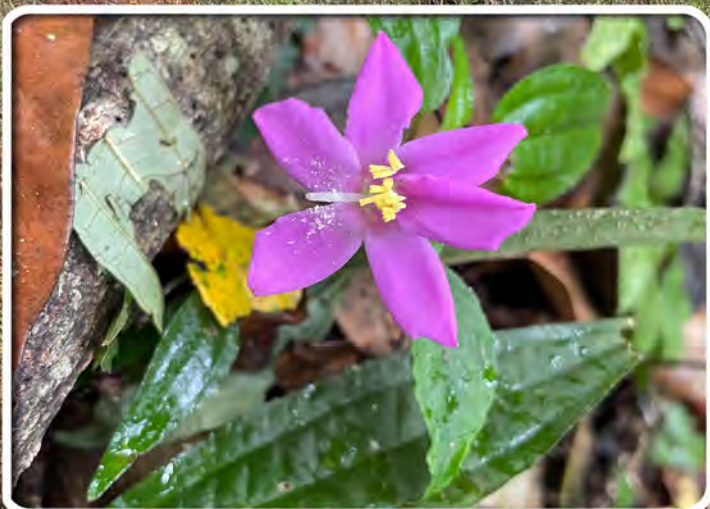
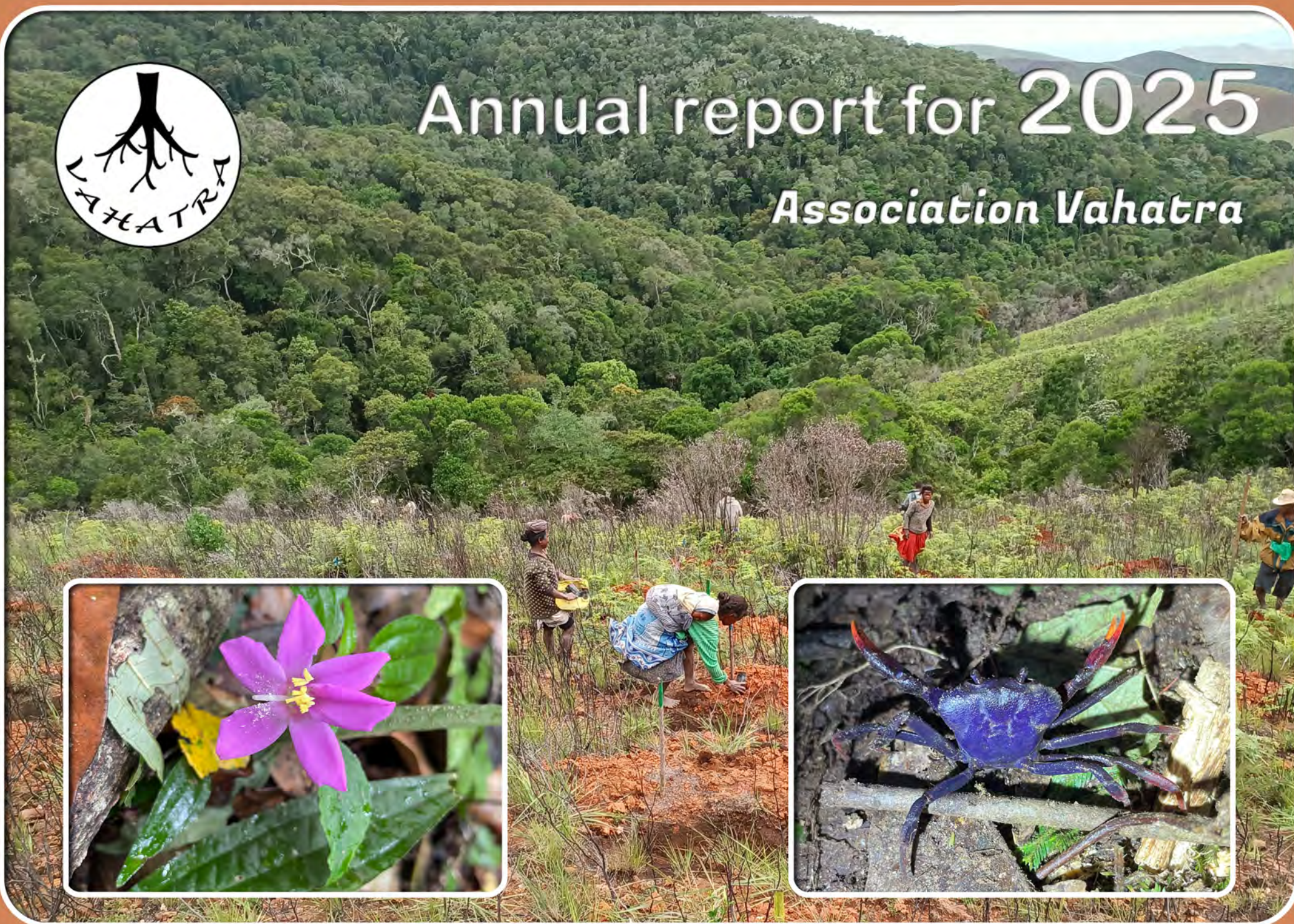




Annual report for 2025

Association Vahatra



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A MESSAGE FROM THE PRESIDENT OF VAHATRA, VOAHANGY SOARIMALALA

The year 2025 has been a period to continue and advance the actions carried out by Association Vahatra and specifically supporting scientific research, capacity building, and biodiversity conservation on Madagascar. It also marked a period of transition with the election of a new president of the association; I am very pleased in my new capacity to present our annual report and some comments and observations in this message.

First off, I wish to express my sincere gratitude to Achille Raselimanana, outgoing President of Vahatra, for his commitment and work during his 17-year term. Given his vision, unwavering dedication, and leadership, Vahatra has emerged as one of the leaders in the field of Malagasy biodiversity, particularly with regards to scientific research, training, and the promotion of the island's natural heritage. Under his leadership, the association has produced well-founded results, strengthened its human and technical capacities, and developed lasting collaborations with national and international partners.

It is with a spirit of continuity that I have the honor to succeed Achille as President of Vahatra. I am fully aware of the responsibilities entrusted to me and, together with the other scientific and administrative members of the association, I will strive to continue, strengthen, and expand existing initiatives, as well as to create new ones. As you will learn in this report, the year 2025 allowed us to define major directions to guide Vahatra's current and future actions. First, Vahatra will focus on intensifying the use of scientific knowledge as a tool for sharing know-how, advancing new generations of Malagasy graduate students, raising public awareness and environmental education, and promoting ecotourism. One aspect of these proposed advances will be the development and distribution of scientific and educational guides for both the general national and international public, as well as local stakeholders, to foster a better understanding of current knowledge, and the sustainable development of the island nation's natural heritage.

Further, Vahatra intends to strengthen its community-based ecological restoration efforts, using solid field science as the point of departure. This approach, as exemplified by our initiatives undertaken in the Ambohitantely Special Reserve that are detailed herein, aim to enhance the involvement

of local communities and consolidate the technical basis for ecosystem restoration. Finally, Vahatra plans to further develop research based on the interactions between social and scientific disciplines, within a broader vision of the «One Health» concept. This integrative approach is a key area that we wish to strengthen, particularly research linking wild and domestic animals with aspects of human health with respect to risks of disease transmission.

The past year has highlighted the capacity of our organization across a spectrum of different activities, ranging, for example, from supporting scientific progress on Madagascar's biodiversity, the training of the next generations of conservation biologists, ecological restoration, and the development of collaborations at different levels. All of these initiatives are based on a collective effort grounded in scientific rigor, knowledge sharing, and maintaining an active field program – all supported by essential administrative assistance. We hope that you will find the different portions of this annual report of interest and windows into some of these activities.

Finally, I wish to express my gratitude to all those who contribute, directly or indirectly, to Vahatra's activities. This shared commitment allows the association to pursue its mission and strengthen its role to help assure the future of Madagascar. Together, we will continue to work towards rigorous and useful science, serving biodiversity conservation, capacity building of young researchers, and safeguarding human health.

Voahangy Soarimalala
President, Association Vahatra



LONG-TERM GOALS

The long-term goals of Association Vahatra are to advance Malagasy scientists, in particular graduate students within the national university system, as well as other members of the conservation biology community, make substantial advances in understanding the island's unique biota, and to disseminate information. Our sincere intent is to put in place an organization with a long-term future and broad vision. Further, with the recent changes of the political perspectives of Madagascar, more specifically the Malagasy Government, we intend to use scientific data to help advance the “greening” of this island nation, to better ensure its advancement and future, as well as enhance management and conservation of its natural heritage.

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 perspective. This is in comparison, for example, to large international organizations that might not necessarily have the interests of Madagascar as their principal point of interest. This aspect is fundamental for the long-term strength of the association, since members are engaged and committed by conviction with respect to the study and conservation of their natural patrimony. Through sustained capacity building, leadership development, community engagement, and long term partnerships, Association Vahatra aims to serve as one of the national platforms to reinforce scientific rigor and adaptive ecological restoration practices.

The seed was planted for Association Vahatra nearly four decades ago in the context of a project organized by WWF-Madagascar, put in place by Olivier Langrand, Sheila O'Connor, and the late Martin Nicoll, and



known as The Ecology Training Program (ETP). Steve Goodman and Achille Raselimanana were the coordinators of the project for well over a decade, during which time several generations of Malagasy graduate students finished their higher degrees within the national university system in animal and conservation biology. Many of these people are among the major actors in the current Malagasy conservation community and across different sectors. For example, some of these former ETP students are now responsible for the advancement of new generations of national field and conservation biologists in at least three different capacities: 1) lecturers and professors within the national university system, as well as private universities, 2) active scientific members of the Vahatra staff or eminent researchers, and 3) playing important roles and holding key positions in the non-governmental and governmental sectors and national research institutes, some of which have been recently established. Some members of the new generation of Malagasy scientists, mentored by the former generation, are now occupying important jobs in different sectors within or outside the country as researchers, teachers or decision-makers.

VAHATRA – PERMANENT STAFF

1. Dr. Voahangy Soarimalala (voahangysoarimalala@gmail.com) – new President and Scientific Coordinator of Vahatra; Head Museum Curator, Mention Zoologie et Biodiversité Animale, Université d’Antananarivo; and Professor, Université de Fianarantsoa. Founding member of Association Vahatra. Voahangy did her DEA and Ph.D. in association with the ETP (see above text under “Long-term Goals”). Voahangy is a mammalogist with a particular interest in rodents and tenrecs. In the past years she has been actively involved in different research projects focusing on the role of endemic and introduced small mammals as reservoirs for zoonotic diseases and pests.
2. Professor Achille P. Raselimanana (raselimananaachille@gmail.com) – former President of Vahatra from 2006 to 2024 and Professor, Mention Zoologie et Biodiversité Animale, Université d’Antananarivo. Founding member of Association Vahatra. Achille was in the first generation of ETP graduates (see above under “Long-term Goals”) and did his DEA and Ph.D. in the context of this program. Achille is a herpetologist with considerable experience in aspects ranging from field studies, classical taxonomy to molecular systematics.
3. Dr. Marie Jeanne Raherilalao (jraherilalao@gmail.com) – Co-editor of the journal *Malagasy Nature* and books published by Vahatra and Professor, Mention Zoologie et Biodiversité Animale, Université d’Antananarivo. Founding member and General Secretary of Association Vahatra. Marie Jeanne did her Ph.D. associated with the ETP (see above text under “Long-term Goals”) and presented her HDR in 2021 at the Université d’Antananarivo. She works on bird ecology, biogeography, and systematics.
4. Dr. Jacques A. Tahinarivony (andonahary@yahoo.fr) – Botanist, Geographic Information Specialist, Geomaticien (discipline concerned with the collection, distribution, analysis, processing, presentation of geographic data), and responsible for the ecological restoration project at Ambohitantely (see below “Vahatra’s ecological restoration project at Ambohitantely”). Jacques co-presented his Ph.D. at Université d’Antananarivo and Université de Genève (Switzerland) in late 2016. Jacques joined the Vahatra field team in 2021, first on numerous field expeditions and recently has become a core member of the association.
5. Professor Steven M. Goodman (sgoodman@fieldmuseum.org) – Scientific Advisor and Vice President of Vahatra; co-editor of the journal *Malagasy Nature* and books produced by Vahatra; and Docteur Honoris Causa, Université d’Antananarivo. Founding member of Association Vahatra. Steve works on both mammals and birds. He plays a major role in the distribution and sale of books from Association Vahatra Press, including at national and international levels. He holds the post of MacArthur Field Biologist, Field Museum of Natural History, Chicago, and since several decades lives in Antananarivo for about 10 months per year.
6. Mrs. Sabrina Raharinirina (msraharinirina@gmail.com) – Financial & Administration Manager. Sabrina joined the association in October 2015. She is responsible for the general functioning of the office and financial affairs. Sabrina also plays an important role in the sales of Association Vahatra publications. She followed coursework at a well-known business school in Antananarivo and received an advance diploma in Management, Financial Management, and Leadership.
7. Mr. Rachel Razafindravao and known as “Ledada” – logistic coordinator. Ledada started working with the ETP some 34 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.

8. Mrs. Sandra Ratsirahaingotiana – domestic help. She has worked with Vahatra since May 2016.
9. Mr. Elisa Malaimbohitsy, Mr. Ialy Tombosoa, and Mr. Brucellin – guardians.



VAHATRA'S BOARD OF DIRECTORS

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

Malagasy nationals

1. Professor Daniel Rakotondravony – Retired Professor from the Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
2. Nanie Ratsifandrihamanana – Country Director, WWF-Madagascar.
3. Chantal Andrianarivo – Former Head of Research and Biodiversity, Madagascar National Parks, and also Technical Advisor at Indian Ocean Commission (Mauritius). She is now Regional Advisor for the United Nations associated with biosafety.
4. Professor Joelisoa Ratsirarison – Département des Eaux et Forêts de l'Ecole Supérieure des Sciences Agronomiques, Université d'Antananarivo and ex-Vice Président of l'Université d'Antananarivo in Charge of International Relations.
5. Professor Raelina Andriambololona – Retired General Director of the Institut National des Sciences et Techniques Nucléaires (INSTN), Université d'Antananarivo, and Doyen of the Malagasy Academy.

Foreign members

1. Professor Jörg U. Ganzhorn – Retired Professor, Tierökologie und Naturschutz, University of Hamburg.
2. Paul Goodman – Principal, Kingfisher Group and Allied District Properties.
3. Olivier Langrand – Executive Director, Critical Ecosystem Partnership Fund (CEPF).
4. Michael Polsky – Founder and CEO, Invenergy.
5. Sara Ruane – Curator of Herpetology, Field Museum of Natural History, Chicago.
6. Link Olson – Curator of Mammals, University of Alaska, Fairbanks.

STUDENTS

As capacity building for the next generations of national field and conservation biologists is at the core of Association Vahatra activities, we collaborate directly with Malagasy students registered within the national university system. The students follow different types of higher diplomas: Licence Professionnelle (=Professional License), Master's II or Ph.D. degrees. The association continues to work with and financially support graduate students and post-docs; we currently have 17 students actively studying with Vahatra scientists as their research directors. Moreover, the association offers these individuals working space at our office in Antananarivo, as well as access to the internet (for non-private purposes), computers, and an excellent library.

In 2013, the Malagasy national university shifted from the classical French scheme to that of an Anglophone License-Masters-Doctorate (LMD) system. Vahatra members with certain higher degrees also act as directors or committee members of a degree known as "Habilitation à Diriger des Recherches" (HDR), a diploma, which does not exist in the Anglophone university system and was originally intended for individuals that would become directors of research institutes or heads of university departments.

The scientific members of Vahatra are also in contact with many other Malagasy students working in the national university system, often as secondary advisors and members of thesis and other types of mentoring committees. The Vahatra office is only a few minutes' walk to the Université d'Antananarivo making access notably simple. We also 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, Fianarantsoa, Mahajanga, Toamasina, and Toliara. Vahatra scientific members are regularly solicited by regional universities to be part of Ph.D. thesis juries. In addition, each year Vahatra scientists advise numerous Malagasy students on aspects of their research, access to literature based on the extensive library housed at our office, and other forms of mentorship. Finally, several Ph.D. candidates working with institutions outside of Madagascar, request Vahatra scientists to be members of their graduate committees.

Since Vahatra open its doors in late 2007, something approaching 2773 different student and research visitors not directly part of the association's

mentoring program have visited the office to use the library facilities. (These figures are based on a sign-in notebook for arriving library users.) The Vahatra library, with respect to modern books on Madagascar and a range of aspects associated with its biodiversity and natural history, is one of the most extensive on the island and represents an important resource. The individuals consulting these books in 2025 included mostly students from different university faculties (science, agronomy, veterinary medicine, etc.) of national and private universities, as well as Malagasy researchers, accessed numerous documents (books, reprints, theses, etc.).

It is worth noting that over the past six years or so, fewer students are using the library facilities at Vahatra and this is certainly related with the reflex of "the new generation" searching for documents on the internet, as well as using artificial intelligence (AI) programs, rather than physically consulting the holdings of libraries. As evidence of this trend, during a recent field school with Master's II students from the Université d'Antananarivo, the question was asked how many had used AI in the past two weeks, resulted in an unanimous show of hands and then we asked how many had opened a book in the past two months, only one person raised their hand. Having said that, a number of students purchase books published by Association Vahatra (at special discounted prices) and, hence, at least for some, their interest in printed books still remains. In any case, to facilitate access to internet accessible documents, Association Vahatra together with a collaborating institution in India, have created an on-line source of close to 10,000 pdfs (see <https://protectedareas.mg/document/list>).

Given the mentoring techniques used during the training of graduate students based at Vahatra, we try to stimulate intellectual curiosity and inspire creative thinking. Hence, for the most part, Malagasy students passing through the Vahatra program develop a clear vision of their professional objectives and the scientific process, which in turn results in good interviews for positions and considerable success finding permanent jobs within the national governmental and nongovernmental sectors. During and after students' participation in Vahatra's capacity building program, they became more responsible of their personal and professional development, for example, initiate foreign language training, apply for grants, obtain scientific lab training, attend international scientific meetings and workshops in or outside the country, and are passionate about research activities.

In many cases these former students obtain posts in domains related to biology and conservation, for example, university appointments, research institutes, working within NGOs, protected areas managers often associated with the Madagascar National Parks, etc. Some of the former students hold or have held key posts in different managerial capacities for organizations such as UNESCO, mining companies, Ministry of Higher Education and Scientific Research, and Ministry of the Environment and Sustainable Development. Certain students after finishing their higher diplomas have taken different directions, such as creating their own organizations or actively involved in the management and conservation of biodiversity in collaboration with local communities.

Hence, taking a broad view, one of the mandates of the association, to advance science and conservation on Madagascar to advance this island nation with focused mentorship of graduate students and conservation biologists, is indeed meeting the intended 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. Unfortunately, since a few years, there has been no recruitment within the national university system.

In the section below is a listing of Malagasy graduate students having completed in 2025 their Master's II, Ph.D. or HDR degrees under the direction of Vahatra scientists or as committee members, as well as those currently in preparation. After receiving their higher degrees from the university, these well-trained and intellectually stimulated young researchers 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 2025 or in preparation

As can be seen from the following lists, the scientific members of Vahatra are actively involved in the advancement of Malagasy graduate students. We consider this one of the hallmarks of the association's interventions to advance science on the island and prepare future generations. Further, we encourage students to publish the results of their scientific work (see towards the end of this annual report, "Scientific outputs of Vahatra during 2025") and take their rightful place in the international scientific community.

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

1. Raharilova, O. 2025. Diversité et écologie des petits mammifères dans les différents habitats forestiers du Parc National de Mantadia, Madagascar. Mémoire de Master, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
2. Randriamananivo, F. 2025. Insectivorie des mammifères terrestres et volants de la forêt sèche décidue de Kirindy CNFEREF, Région Menabe, Madagascar. Mémoire de Master, Mention Zoologie et Biodiversité Animale, Université d'Antananarivo.
3. Ravoloniaina, M. 2025. Analyses structurale et spatiale de la communauté des amphibiens utilisant des écosystèmes aquatiques et des habitats riverains dans la RS d'Ambohitantely, Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
4. Razafimandimby, J. L. 2025. Structure de la communauté de petits mammifères du Parc National de Marojejy, Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
5. Tolojanahary, H. 2025. Profil écologique des arbres menacés de la Réserve Spéciale d'Ambohitantely (District Ankazobe, Région Analamanga), Mémoire de Master en Biologie et Ecologie Végétales, Université d'Antananarivo.



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

1. Andrianarivony, F. M. 2025. Diversité et préférence écologique des poissons d'eau douce de la côte est de la péninsule de Masoala, Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
2. Anthoni, C. 2025. Distribution et étude morphologique des chauves-souris de l'Aire Protégée Harmonieux Andrafiarana-Andavakoera, nord de Madagascar. Mémoire de Master, Faculté des Sciences, Université d'Antsirananana.
3. Carcauzon, V. 2025. Epidémiologie de la peste sylvatique à Madagascar. Ecole Doctorale, Ph.D. Université de la Réunion.
4. Parany, M. N. J. 2025. Ecologie et génétique des réservoirs de la peste dans un foyer endémique, Ankazobe : implications dans la surveillance et la lutte à Madagascar. Thèse de doctorat, Ecole Doctorale en Sciences de la Vie et de l'Environnement, Immunologie, Immunopathologie, Immunodiagnostic, Université d'Antananarivo.
5. Rajemison, B. 2025. Régime alimentaire des animaux insectivores cas des oiseaux, de tenrec et des chauves-souris. Thèse de doctorat, Ecole Doctorale, Génie des Procédés et des Systèmes Industriels, Agricoles et Alimentaires, Université d'Antananarivo.
6. Rakotobe Harimanana, R. N. 2025. Mécanismes et déterminisme de la capacité et compétence vectorielles de *Synopsyllus fonquerniei* et *Xenopsylla brasiliensis* vis-à-vis de *Yersinia*. Thèse de doctorat, Ecole Doctorale en Sciences de la Vie et de l'Environnement, Entomologie Médicale, Université d'Antananarivo.
7. Randriamiarantsoa, S. H. 2025. Impacts des feux de forêts sur la population des lémuriniens dans le Parc National d'Ankarafantsika, Nord-ouest de Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
8. Raelinjanakolona, N. N. 2025. Effets de lisière, résultant de la fragmentation forestière, sur les frugivores et le réseau d'interactions entre plantes et frugivores. Thèse de doctorat, Ecole Doctorale en Science de la Vie et de l'Environnement, Spécialités Ecologie, Université d'Antananarivo.
9. Rasoamalala, F. 2025. Implication des puces de petits mammifères dans l'épidémiologie de la peste dans le district d'Ankazobe, Madagascar. Thèse de doctorat, Ecole Doctorale en Science de la Vie et de l'Environnement, Spécialités Entomologie Médicale et épidémiologie des Maladies Infectieuses, Université d'Antananarivo.



UNIVERSITÉ D'ANTANANARIVO



ECOLE DOCTORALE SCIENCES DE LA VIE
ET DE L'ENVIRONNEMENT

EQUIPE D'ACCUEIL DOCTORALE
IMMUNOLOGIE, IMMUNOPATHOLOGIE, IMMUNODIAGNOSTIC

THESE POUR L'OBTENTION DU DIPLOME DE DOCTORAT
SPECIALITE : ECOLOGIE ET GENETIQUE DES POPULATIONS

Ecologie et génétique des réservoirs de la peste dans un
foyer endémique, Ankazobe : implications dans la
surveillance et la lutte à Madagascar

Présentée par

PARANY Mamionah Noro Jully

Soutenue publiquement le 21 Octobre 2025

Devant les membres de jury, composé de :

Présidente	: Madame Doll Aurore Rakoto, Professeure titulaire
Directrice	: Madame Minoarisoa Rajerison, Docteur HDR
Co-Directrice	: Madame Carine Brouat, Docteur HDR
Rapporteur interne	: Monsieur Hajanirina Rakotomanana, Professeur titulaire
Rapporteur externe	: Monsieur Lily Arison René De Roland, Professeur titulaire
Examineurs	: Madame Zara Razafiarimanga, Professeure titulaire Monsieur Steven M. Goodman, Docteur HDR
Membre invité :	: Monsieur Gauthier Dobigny, Docteur

C) Master's and Ph.D. diplomas in preparation in direct collaboration with scientific members of the Association Vahatra and in most cases will be presented in 2026.

1. Andriamanantena, F. Sécurité alimentaire et conservation de la biodiversité : Une analyse socio-économique des dynamiques d'exploitation des ressources dans les zones périphériques du PN de Zombitse-Vohibasia. Madagascar. Thèse de Doctorat, Ecole Doctorale Science de la Vie et de l'Environnement, Université d'Antananarivo.
2. Andriantsalama, M. S. Les vertébrés utilisateurs des huit espèces d'arbres menacés de la Réserve Spéciale d'Ambohitantely, Région Analamanga, Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
3. Harinaina, A. Etude éco-biologique et comportementale de la reproduction de la Mesite variée (*Mesitornis variegatus*, Mesitornithidae) dans la forêt sèche de Kirindy CNFEREF, Morondava. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
4. Iarintsoa, S. F. Etude du reflet des habitats utilisés sur les régimes alimentaires de *Tyto* spp. (famille de Tytonidae). Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
5. Radovimiandrinarany, H. T. R. Etude éco-biologique et lutte contre les rongeurs exotiques nuisibles dans la Commune Rurale d'Analavory Itasy, Madagascar. Thèse de Doctorat, Faculté des Sciences, Université d'Antananarivo.
6. Rajaobelina, M. M. Influences de la qualité et structure de l'habitat sur la structure génétique de la population des lémurins diurnes, Parc National d'Andasibe-Mantadia. Thèse de Doctorat, Ecole Doctorale Science de la Vie et de l'Environnement, Université d'Antananarivo.
7. Rajoelison, M. N. M. Les indices parasitaires des ectoparasites des petits mammifères non volants suivant le niveau de perturbation humaine au sein de l'Aire Protégée de Maromizaha, Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
8. Rakotoariasoa, F. E. Etude du déplacement des rongeurs et de la dispersion écologique de l'espèce introduite *Rattus rattus* (Muridae), étude de la communauté d'invertébrés dans les terriers dans le nord-est de Madagascar. Thèse de Doctorat, Ecole Doctorale Science de la Vie et de l'Environnement, Université d'Antananarivo.
9. Rakotoarimalala, F. M. Etude de la distribution spatiale et analyse structurale de la communauté des caméléons dans un système forestier fragmenté. Thèse de Doctorat, Ecole Doctorale Science de la Vie et de l'Environnement, Université d'Antananarivo.
10. Ralison, B. Contribution à l'étude du régime alimentaire et écomorphologie des ailes des chauves-souris insectivores dans le Parc National de Namoroka,



UNIVERSITE D'ANTANANARIVO
FACULTE DES SCIENCES
MENTION ZOOLOGIE ET BIODIVERSITE ANIMALE



Laimeria chalumnae

MEMOIRE POUR L'OBTENTION DU
DIPLOME DE MASTER
PARCOURS BIOLOGIE DE LA CONSERVATION ANIMALE

**INSECTIVORIE DES MAMMIFERES TERRESTRES ET VOLANTS
DE LA FORET SECHE DECIDUE DE KIRINDY CNFEREF,
REGION MENABE, MADAGASCAR**

Présenté par

RANDRIAMANANIVO Finoana Sanda Fahendrena

Devant le Jury composé de :

- Président : Monsieur RASELIMANANA Achille P.
Professeur Titulaire
- Rapporteur : Madame RATSOAVINA Fanomezana M.
Maître de Conférences
- Co-Rapporteur : Monsieur RAMANANTSALAMA Riana V.
Docteur
- Examineurs : Monsieur RAKOTOMALALA Zafimahery
Maître de Conférences
Monsieur GOODMAN Steven M.
Docteur HDR

Soutenu publiquement le 14 novembre 2025



Nord-ouest de Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.

11. Ramanampamonjy, T. L. Etude sur la communauté des chauves-souris dans la forêt de Kalanoro, Centre-est de Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
12. Randriaharimanana, H. N. Etude du régime alimentaire des chauves-souris frugivores (Chiroptera: Pteropodidae) dans le Parc National de Namoroka, nord-ouest de Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
13. Rasoanandrianina, D. C. Influence de cours d'eau sur la distribution des Vangidae et l'emplacement de leurs nids dans la forêt sèche de Kirindy CNFEREF, Morondava, Madagascar. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
14. Rasoanilana, M. F. Etude de l'impact de la dégradation des habitats naturels sur les communautés de petits-mammifères de Maromizaha. Mémoire de Master, Mention Zoologie et Biologie Animale, Université d'Antananarivo.
15. Rasoarimanana, V. M. C. Importance de chauves-souris frugivores endémiques à Madagascar (Chiroptera : Pteropodidae) : *Pteropus rufus*, *Eidolon dupreanum* et *Rousettus madagascariensis* dans la régénération forestière du Parc National des Tsingy de Namoroka, partie nord-ouest de l'île. Thèse de Doctorat, Ecole Doctorale Science de la Vie et de l'Environnement, Université d'Antananarivo.
16. Ravelotafita, S. S. O. Abondance relative et diversité biologique des micro-mammifères dans les zones forestières et les zones dégradées. Thèse de Doctorat, Ecole Doctorale Science de la Vie et de l'Environnement, Université d'Antananarivo.
17. Volanantenaina, H. Etude de la phénologie des palmiers et des interactions avec les visiteurs floraux dans la Réserve Naturelle Intégrale de Betampona. Mémoire de Master, Mention Biologie et Ecologie Végétales, Université d'Antananarivo.

LARGE-SCALE DEMONSTRATIONS IN ANTANANARIVO

Madagascar is one of the poorest nations in the world and a significant portion of the population lives on less than 1 USD per day. Over the past decades there have been several changes in government, often forced through different forms of coup d'état. Further, the country has considerable problems with corruption at different levels of the economic sectors and government. Little has been done to renew and advance aspects of infrastructure in Antananarivo, the nation's capital, and other population centers around the island there are frequent cuts in water and electricity.

Further, guaranteed university student monthly stipends of \$10 USD per month are rarely or infrequently paid.

In late September 2025, first organized by the Madagascar Generation Z group and subsequently joined by other sectors of society, large-scale demonstrations with thousands of participants took place, particularly in Antananarivo, at first demanding improvements in water and electrical services. The demonstrators' directives quickly developed into demands for large-scale social change and the departure of the president and the government, and bringing people suspected of corruption at the civil society and governmental levels to justice. These gatherings were countered with considerable retaliatory measures and numerous people were injured and there were some fatalities. Also associated with these manifestations, there was considerable destruction of property and pillage of stores that were directly or symbolically tied to the corrupt governmental or certain social-



In late September to early October of this year, Madagascar experienced large-scale demonstrations aimed at social and economic reforms. The meeting point in the capital city for these rallies was often at the Université d'Antananarivo, as seen from the balcony of the Vahatra office, in close proximity.

economic sectors. All of this led to major changes in the government, including a new president.

As the Gen Z group was largely composed of university students, it was practical that the meeting point to start the demonstrations was at the Université d'Antananarivo, a few minutes' walk from the Vahatra office. Although on a few occasions rather alarming, no incident directly impacted the Vahatra facilities. Despite all of the strikes and problems, Vahatra was able to continue to work normally, although a few programs had to be postponed.

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 2024 as reviewers for papers submitted to the following international journals:

- *African Zoology*
- *Animal Conservation*
- *Biological Journal of the Linnean Society*
- *Biotropica*
- *Ecography*
- *Ecology*
- *Ecology and Evolution*
- *Ecology and Society*
- *Faunistic Monographs*
- *Journal of Tropical Ecology*
- *Journal of Vertebrate Paleontology*
- *Malagasy Nature*
- *Mammalian Biology*
- *Molecular Ecology*
- *PeerJ*
- *People and Nature*
- *PLoS One*
- *Tropical Zoology*
- *Wildlife Biology*
- *Zoological Journal of the Linnean Society*

MALAGASY NATURE

Our intention with the scientific journal *Malagasy Nature*, published by Association Vahatra and with free online download of articles, is to advance peer-reviewed papers at high scientific and technical standards and specifically supporting the advancement of young researchers and graduate students from Madagascar and neighboring islands. *Malagasy Nature* has an International Standard Serial Number (ISSN), making it an international scientific journal published in Madagascar. Manuscripts in French or English are passed through an editorial team and follow a review process of international norms. An important difference compared to most scientific journals is that the editors of *Malagasy Nature* work closely with Malagasy or western Indian Ocean island authors, particularly students and individuals at the start of their careers, to help them understand the process of composing and writing scientific articles. In many cases, the first couple of publications of a young researcher pose considerable hurdles and the editors of *Malagasy Nature* provide the means for less experienced scientists to negotiate such problems.

Based on this approach, the journal plays an important role in regional scientific capacity building, which in turn separates it from other international journals, which normally the editors, editorial committee, and manuscript reviewers are not readily available to help at the same level of mentorship for manuscript submission and revision. Further, given that article downloads for *Malagasy Nature* are free, this allows national and regional scientists to return information to the worldwide scientific world, and provides the means for conservation managers and other users to have easy access to reliable and updated information. All of these aspects together, provide professional advancement for the western Indian Ocean island scientific community, specifically a certain sense of responsibility and for regional authors to understand the importance of invested efforts when producing scientific articles. For Malagasy students preparing their theses in the national university system, they are required to have published a certain number of scientific publications before they can finalize the thesis submission. An article published in or accepted by *Malagasy Nature* counts towards this quota.

As a further point of explication, several researchers preparing their theses submit articles to *Malagasy Nature*, as they understand that when needed or appropriate they will get assistance from the editorial team to improve their manuscripts. The on-line publication of the journal 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 for which electronic files are often not readily downloadable or repatriated to Madagascar. All numbers published to date of *Malagasy Nature* are available online and with free access (<http://www.vahatra.mg/malagasynaturefr.html>).

Marie Jeanne Raheirilalao and Steve Goodman are the co-editors of *Malagasy Nature* and several associated editors assist in different aspects with submitted manuscripts. Malalarisoa Razafimpahanana is responsible for the design and type-setting of each volume, as well as posting articles on the journal website. On average, at least one volume of the journal is published each year. The editorial board of *Malagasy Nature* is composed of both national and international scientists, from both the Anglophone and Francophone worlds, made up of the following individuals:

Editors

Marie Jeanne Raheirilalao
Steve Goodman

Associated editors

Achille P. Raselimanana
Malalarisoa Razafimpahanana
Voahangy Soarimalala
Jacquis Andonahary Tahinarivony

Editorial committee

Birds

Frank Hawkins
Olivier Langrand

Mammals

Jean-Marc Duplantier
Jörg U. Ganzhorn
Peter J. Taylor
Daniel Rakotondravony

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 most recent volume of the journal was published in 2025 and is a monograph dedicated to the Andrafiarana-Andavakoera protected area in the north of Madagascar. The articles can be downloaded at <http://www.vahatra.mg/volume19.html>. Volume 19 includes the following papers:

Volume 19 (2025)

- **Description of the Paysage Harmonieux Protégé d'Andrafiarana-Andavakoera, Madagascar, and the 2023 biological inventory of the protected area** — Jacques A. Tahinarivony & Steven M. Goodman [pdf](#)
- **Association Fanamby : Collaborer avec les communautés pour établir une résilience afin de conserver les aires protégées à Madagascar** — Tiana Andriamanana, Hortensia H. Bezara & Sehen Andriantsaralaza [pdf](#)
- **Species new to science described from Andrafiarana-Andavakoera since 1988** — Steven M. Goodman & Brian L. Fisher [pdf](#)
- **Combining spatial and ecological approaches to describe the vegetation of the Paysage Harmonieux Protégé d'Andrafiarana-Andavakoera** — Jacques A. Tahinarivony & Laurent Gautier [pdf](#)
- **An analysis of the angiosperm flora of the Paysage Harmonieux Protégé d'Andrafiarana-Andavakoera, northern Madagascar, with a provisional checklist** — Laurent Gautier, Carlos G. Boluda, Alain P. Rasolonjatovo, Louis Nusbaumer & Jacques A. Tahinarivony [pdf](#)
- **Some notes on the land snails of the Andrafiarana-Andavakoera protected area, northern Madagascar** — Owen Griffiths [pdf](#)
- **Freshwater crabs (Brachyura: Potamoidea: Deckeriidae) from the Andrafiarana-Andavakoera protected area in northern Madagascar, including a new genus and species, *Dianathelphusa antsahabe* n. sp.** — Neil Cumberlidge & Savel R. Daniels [pdf](#)
- **Herpetofaunal diversity in northern Madagascar: The Andrafiarana-Andavakoera protected area** — Fandresena Rakotoarimalala, Arianna Kuhn, Achille P. Raselimanana & Sara Ruane [pdf](#)
- **Communauté d'oiseaux et importance biogéographique du Paysage Harmonieux Protégé d'Andrafiarana-Andavakoera, Nord de Madagascar** — Marie Jeanne Raheirilalao & Steven M. Goodman [pdf](#)
- **The non-primate and non-volant mammals of the Andrafiarana-Andavakoera protected area, northern Madagascar** — Steven M. Goodman & Voahangy Soarimalala [pdf](#)
- **The bats of the Andrafiarana-Andavakoera protected area, northern Madagascar** — Steven M. Goodman, Loïta V. Razafindranosy & Clemson Anthoni [pdf](#)

Malagasy Nature



**A floral and faunal inventory
of the Andrafiamena-Andavakoera protected area
of northern Madagascar**

Editeurs : Steven M. Goodman & Jacques A. Tahinarivony

- **Diet of *Paratriaenops auritus* (Chiroptera: Rhinonycteridae) in the Andrafiamena-Andavakoera protected area, northern Madagascar** — Loïta V. Razafindranosy, Steven M. Goodman & Balsama Rajemison [pdf](#)
- **Les Lémuriens du Paysage Harmonieux Protégé d'Andrafiamena-Andavakoera, Nord de Madagascar** — Tojonirina P. Rafalimanana [pdf](#)

THE PUBLISHING HOUSE OF ASSOCIATION VAHATRA

A guide series on Madagascar's unique biodiversity or put in another manner converting scientific information into tools for awareness and education

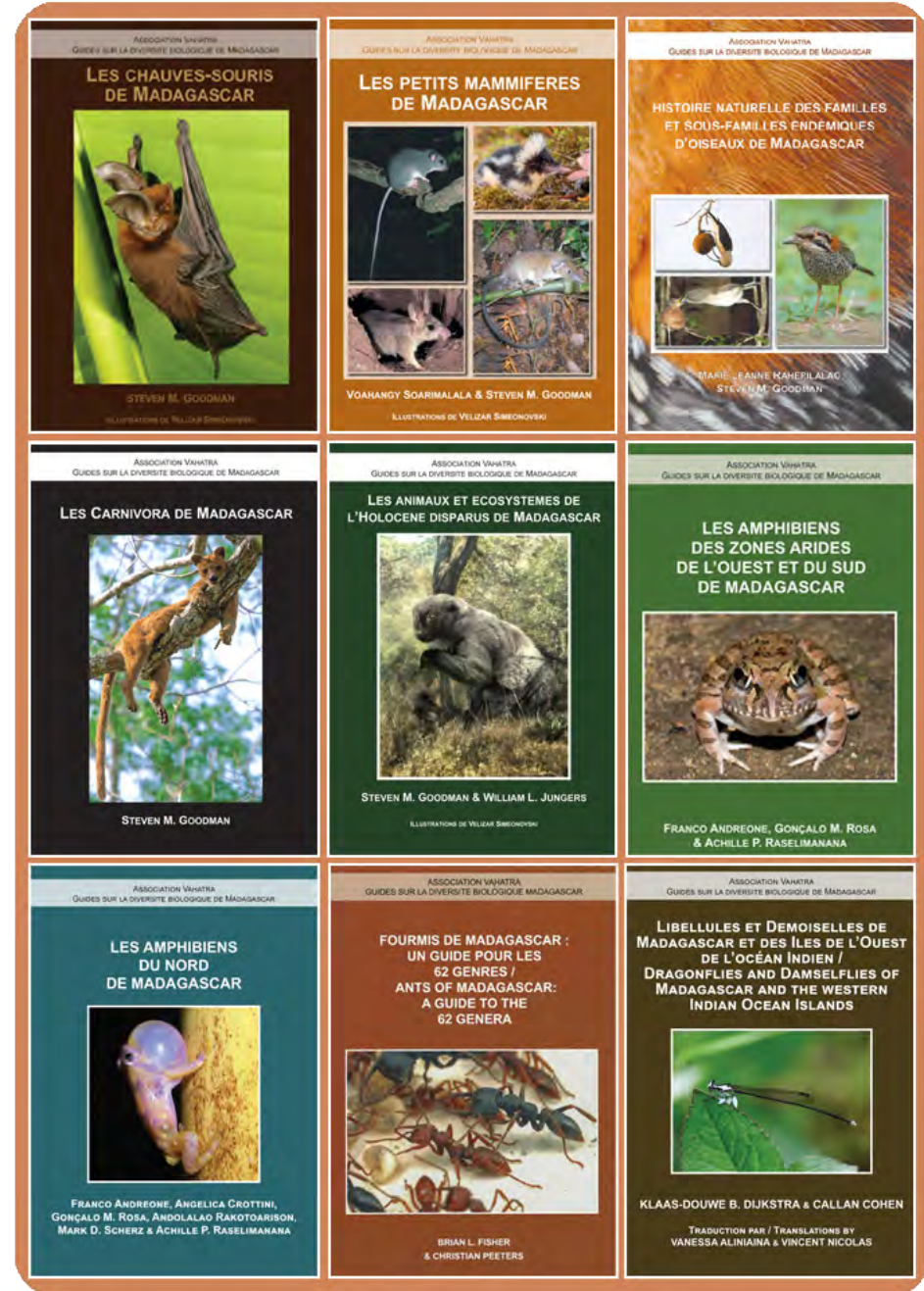
The year 2011 marked an important advancement for Association Vahatra with the creation of its own publishing house, first focusing on a series entitled “Guides sur la diversité biologique de Madagascar” [Guides to the biological diversity of Madagascar]. For individuals that grew up over the past decades in, for example, North America, portions of Latin America or western Europe, information on regional plants and animals are readily available in field guide book format. These types of books, generally presented by taxonomic group (e.g. ferns, reptiles, birds, etc.) and region (e.g. east of the Mississippi, Peru, European Alps), revolutionized making information on biodiversity available and penetrable for members of various age and social groups in different parts 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 perceive the importance of the natural world. It is not an exaggeration to state that these types of guides have been important elements in the “greening” of different societal sectors in numerous countries. More recently, the availability of such information has been advanced by an assortment of different online sites and smartphone applications, although for certain individuals there is a sort of satisfaction and practicality in the field to physically have such books in the hand. For Madagascar, which is so rich in biological diversity and being one of the world's principal tropical conservation priorities, the largely previous lack of such books created a considerable void, which Association Vahatra strongly believes needed to be filled.

Since 2011, nine books have been published in the Guides to the biological diversity of Madagascar series, which is edited by Steve and Marie Jeanne, and designed and typeset by 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 Raheirilalao & 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 écosystèmes 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.
8. *Fourmis de Madagascar : Un guide pour les 62 genres / Ants of Madagascar: A guide to the 62 genera* (a bilingual French-English book) by Brian Fisher & Christian Peeters, 2019, 253 pp.
9. *Libellules et demoiselles de Madagascar et des Iles de l'Océan Indien occidentale / Dragonflies and damselflies of Madagascar and the western Indian Ocean Islands* (a bilingual French-English book) by K. D. Dijkstra & Callen Cohen, 2021, 194 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 series of generous gifts from the Ellis Goodman Family Foundation and Paul Goodman (just a coincidence and no family relation to Steve Goodman) allowed additional guides in the series to be published.



To date, other than free or at production costs diffusion of Association Vahatra Press books to Malagasy students and scientists, copies have been sold to people coming to the Vahatra office, at different fairs in Antananarivo, and through local and overseas booksellers. We are pleased with the interest these books have generated, which includes seeing Malagasy students and naturalists, as well as foreign tourists, carrying and consulting the books on trips to forested areas. Further, these books are important resources for national students and researchers, as well as reference works for university courses. For three titles, the printed stock was depleted in 2024 and we reprinted these books, another clear indication of their general interests. Currently, we have one new book in preparation concerning the insects of Madagascar. A few scientific teams are considering putting together books on the freshwater crabs of Madagascar, as well as the genera of spiders occurring on the island.

The University of Chicago Press is responsible for the distribution of Vahatra books (see http://www.press.uchicago.edu/ucp/books/publisher/pu3431914_3431915.html) largely in the New World and Natural History Book Service (NHBS) (<https://www.nhbs.com/publisher/vahatra>) in the UK and Europe, which also include the *Atlas of selected vertebrates of Madagascar* published in late 2013, and *Les aires protégées terrestres de Madagascar : Leur histoire, description et biote / The terrestrial protected areas of Madagascar: Their history, description, and biota* released in March 2018. Further, many of these books are available from Amazon in Europe and North America.

An ecotourism guide series published by Association Vahatra in collaboration with Madagascar National Parks or in another manner advancing tourism on Madagascar

The extraordinary levels of animal and plant species diversity on Madagascar, including high levels of endemism, well known to national and international naturalists, biologists, and conservation interested tourists, as well as the heavy burden of anthropogenic pressures, make the island one of the world's most critical biodiversity "hotspots". Association Vahatra is of the view that one important way to advance worldwide attention to the island's protected areas system is through dissemination of information on these sites.

About 5% of the incoming foreign currency to Madagascar, at least before the COVID-crisis, was associated with tourism; hence, an important



financial infusion into the national economy. With this aspect in mind and looking for a means to advance ecotourism on the island, Association Vahatra started a book series “Guides écotouristiques des aires protégées” [Ecotourism guides to protected areas] and published in collaboration with Madagascar National Parks, the principal protected manager on the island. At least in part, by augmenting the amount of general information available for foreign and national tourists visiting protected areas in a series of simple pocket books and with high scientific reliability and fascinating details, our intent is to increase interest and visitation rates at these sites. Further, an increased number of visitors will help advance local socioeconomic aspects in towns and villages around the protected areas, as well as the national economy. Finally, books in the series are important to help local guides update their knowledge on the protected areas they work, a sort of retooling.

To date, we have produced four bilingual (French/English) books concerning frequently visited protected areas. These sites are part of standard tourist circuits, in close vicinity to national roads, and with excellent to good local infrastructure (guides, hotels, and restaurants). All of the protected areas covered are under the management of Madagascar National Parks, who is a direct collaborator in this project. The first four books written by Steve Goodman, Marie Jeanne Raherilalao, and Sébastien Wohlhauser include:

1. Northern set of protected areas (Lokobe, Ankarana, Montagne d’Ambre) – published in 2022,
2. Central east set of protected areas (Analamazaotra and Mantadia) – published in 2022,
3. Southeastern set of protected areas (Ranomafana and Andringitra) – published in 2023,
4. Southwestern set of protected areas (Isalo and Zombitse-Vohibasia) – published in 2024.

The fifth book in the series, on the Marojejy and Anjanaharibe-Sud protected areas in the northeast of the island, is well advanced and should be published in the first quarter of 2026. This book will most likely be the last book in the series, as all of the major Madagascar National Parks protected areas visited my considerable numbers of tourists, will have been covered.

VAHATRA’S ECOLOGICAL RESTORATION PROJECT AT AMBOHITANTELY – NEW ORIENTATION, SCOPE, AND TARGETS

A general overview

The Ambohitantely Special Reserve, located a few hours drive to the west of Antananarivo, contains one of the last remaining montane humid forests in the Central Highlands of Madagascar. This forest type was once widespread across this vast geographic zone that covers about one-third of the surface area of the island. Such montane forests are now among the most endangered vegetation types on the island. A few decades ago, the Ambohitantely protected area, managed by Madagascar National Parks (MNP), comprised about 90 forest fragments, ranging from tiny parcels to blocks exceeding 1,200 hectares, separated by open grasslands. This configuration of natural forest in a sea of open habitat provided an ideal setting for studying the relationship between species richness within forest block of different size, and focused on birds, small mammals, and amphibians.

Over the past decades, however, the natural vegetation cover within the protected area has been severely reduced, primarily due to fires that spread across the grasslands and enter into the forest. These fires are often intentionally set to renew grazing lands for cattle, triggered naturally by lightning strikes, or initiated as acts of defiance directed against the state. For several decades, scientific members of Vahatra, all field biologists specializing in terrestrial vertebrates, have worked in this protected area and witnessed the progressive loss of natural forest habitat. Recognizing the urgency of the situation, we decided that immediate action was necessary in collaboration with MNP and local communities to preserve what remains of the natural forests of Ambohitantely, once again for emphasis, one of the last montane forest remnants in this region of the island.

Since the launch of this project in July 2021, numerous successes have been achieved despite significant challenges, including those related to fire prevention within the intervention zone, as well as technical and financial constraints. To overcome these difficulties, the team has consistently shared project progress and achievements with its partners, while inviting stakeholders to visit the site and observe our activities firsthand.

Convinced by the approaches and management methods employed, the principle donor at the first stages of the project, Rädde Regnskog or Save the Rainforest (Sweden), has continued its unwavering support. In late 2024, Association Vahatra signed a fourth funding agreement with this organization to sustain the project's activities.

Impressed by the results achieved and the project's long-term goals, the Critical Ecosystem Partnership Fund (CEPF) has also provided two additional grants to strengthen Vahatra initiatives at Ambohitantely. The first, through the Franklinia Foundation, focuses on protecting 19 threatened tree species within the special reserve, while the second supports the dissemination of best practices associated with ecological restoration to Malagasy institutions and a range of partners, as well as augmenting infrastructure and some technical work. This ongoing commitment to progress, coupled with continuous improvement of techniques and approaches, has also garnered support from other partners, such as the Hempel Foundation; two travel agencies dedicated to conservation of the natural habitats of the island (Madagascar Classical Collection and Asisten Travel); and friends of Association Vahatra for different activities (Paul Goodman, Michael and Tanya Polsky, Bob and Gail Loveman, and Jai Shekhawat), including work at Ambohitantely. During 2025, we also welcomed several private individuals, including, for example, the family of Christophe De Jaeger, to visit the site and volunteer their time associated with different aspects of ecological restoration.

Vahatra milestones at Ambohitantely in 2025

Ecological restoration activities within the Ambohitantely Special Reserve continued to make significant progress in 2025, both in terms of the scale of interventions and the quality of achieved outcomes. The project has evolved toward a more comprehensive and strategic approach, with actions specifically designed to address the site's ecological characteristics and prevailing climatic conditions. These efforts have strengthened the role of Vahatra's interventions at Ambohitantely as a pilot site for ecological restoration within protected areas. Such aspects have been further reinforced through the recognition and engagement of key stakeholders, as well as the technical endorsement and financial support of scientific and funding partners.

The results and lessons learned to date associated with this project have been actively documented and disseminated through different communication channels. They have been highlighted by Vahatra's team via the organization's website and have also received wider visibility through national and international platforms, including INDRIS (<https://tinyurl.com/2bjj6sm9>), *Vox* (<https://www.vox.com/climate/468685/madagascar-chameleon-wildfire-climate-change>), and *Gecko* magazine, which focuses on biodiversity across the southwestern Indian Ocean region (to be published shortly).

Beyond the achievements in active and assisted passive ecological restoration (see below for specifics about these different techniques), Vahatra has further strengthened its engagement with national and international stakeholders in order to expand opportunities for knowledge sharing, exchange of experiences, and good practices, as well as capacity building with respect to ecological restoration. At the community level, local people are showing increasing awareness and commitment to ecological restoration and ecosystem protection. This positive momentum is driven by the combined effects of the project's direct and indirect contributions, the tangible results observed over four years of implementation, and the sustained strengthening of partnerships and commitments among stakeholders. In 2025, in addition to the high survival rates recorded across all restoration plots and the continued enforcement of a zero-fire policy within the project's intervention area, several key aspects deserve particular attention.

1. Exchanges and sharing of knowledge among stakeholders in ecological restoration

In the first portion of the year, Vahatra organized three different field schools at Ambohitantely and with the support of CEPF (see below "Current Vahatra Projects and Grants"). These different sessions brought together more than 45 participants from a wide range of backgrounds. These included protected area managers, university and research institutions, biodiversity funding agencies, and practitioners involved in reforestation, afforestation, and ecological restoration. Representatives from non-governmental organizations and civil society groups (including local groups) also took part in these sessions.



Left - Use of waterbox, shared by Minoosa Nombanjanahary of Tsimoka Association and **right** - discussion and sharing of knowledge on forest fragmentation, led by Steve Goodman (Vahatra Association).

These *field schools* provided a structured platform for sharing experiences, knowledge transfer, and the dissemination of best practices. They also generated valuable lessons for Vahatra, contributing to the continuous strengthening and adaptive improvement of its interventions at the site.

2. Visit to site of Critical Ecosystem Partnership Fund (CEPF) grant recipients and staff

In May, more than 90 individuals went to Ambohitantely for a day visit and representing a range of institutions from Madagascar and different western Indian Ocean islands, many being recipients of CEPF funding, to observe and learn about the ecological restoration project implemented by Vahatra. The group also included CEPF staff members based in the region or overseas. This visit was arranged as a field trip part of the mid-term evaluation of CEPF-funded projects and provided a valuable platform for stakeholders to

meet, interact, and, above all, exchange information, experiences, and best practices in conservation and ecological restoration.

For Vahatra, the event offered the opportunity to:

- Present the ecological restoration approaches that can be applied within a protected area, such as Ambohitantely in the Central Highlands, in line with IUCN guidelines and national regulatory frameworks.
- Report to CEPF in a direct first-hand manner the results achieved and the implementation of on-site activities.
- Share key challenges encountered, particularly those related to the long-term sustainability and durability of ecological restoration interventions.
- Learn from and listen to the feed-back of the different participants concerning Vahatra activities and approaches to ecological restoration.
- Share a fine moment together in a splendid locality.



On 9 May 2025, more than 90 individuals visited Ambohitantely for a day visit to learn about Vahatra ecological restoration activities at the site. This included numerous grantees of CEPF and regional and international members of the organization. Photo courtesy of the Critical Ecosystem Partnership Fund.

3. Visits by other stakeholders interested in activities at Ambohitantely

Beyond the participants in the field schools and the CEPF visit, Ambohitantely was also visited in early 2025 by Johannes Bergsten from the Swedish National Museum in Stockholm and a member of Save the Rainforest (Sweden) board of directors. His visit had a dual objective: 1) to conduct research on aquatic insects and 2) to assess the progress of the ecological restoration project, as well as the condition of the infrastructure built with financial support from Save the Rainforest for three consecutive years; this funding played a critical role in the initiation and subsequent development of the restoration project. At the conclusion of his visit, Johannes Bergsten expressed satisfaction with the results and his confidence in the relevance and effectiveness of the approaches and methodologies employed by Vahatra. He also had the opportunity to engage directly with members of the local communities involved in the project.

Vahatra also hosted staff members from GIZ (Gesellschaft für Internationale Zusammenarbeit), Graine de Vie, and PLAE (Programme de Lutte Anti-Erosive), all groups well known for their work in reforestation and erosion control across Madagascar. These visits focused on knowledge

and practice exchanges, including techniques for valorizing firebreak debris through composting, plantation design approaches aligned with reference habitat structure, and the observation of growth and survival rates of native and endemic forest species across the different ecological restoration plots.

4. Expansion of the nursery

The techniques for phenological monitoring and seed collection are now fully operational. This work is jointly implemented by local community members, including nursery technicians, and Vahatra's scientific team. This coordinated framework has enabled the project to collect seeds and fruits from monitored plant species, with particular emphasis on individuals located within the permanent forest plots. These collection activities were conducted in parallel with active ecological restoration efforts and directly contributing to a substantial increase in seedling production in the nursery.

The nursery currently hosts 66 plant species, including trees and shrubs, all of which are native and many endemic to Madagascar and naturally occurring in the forests of Ambohitantely. Among these, 18 species are



The seeds of all the trees grown in the nursery and then transplanted in the restoration parcels come from the remaining forest of Ambohitantely and genetically local stock. Here is shown the collection of ripe fruits and the seeds that will be saved for planting.

threatened according to the IUCN Red List. Over the course of the year, the nursery underwent three successive expansion phases, carried out in March, July, and December. Its current surface area covers is 1214 m² and supports a production capacity of up to 46,000 seedlings every six months or 92,000 per year. In line with the phenological patterns of the target species observed in the forest plots and the continuous implementation of planting activities within the active ecological restoration plots, the nursery operates at full capacity throughout the year. As a result, seedbeds and germination trays have remained continuously occupied, with no periods of vacancy.

5. Installation of an automatic watering system

In 2025, the nursery increased its seedling production capacity through successive expansions of planting beds, combined with the addition of new germination units and seedbeds. With financial support from the Hempel Foundation, we were able to install an automated irrigation system.



Upper photo – Drone view of the Vahatra infrastructure at Ambohitantely, the biological station buildings to the left of park vehicles, behind to the left the new sanitary facilities, and slightly below tent lean-to structures; in the lower section the tree nursery. **Lower photo** – A close up of the tree nursery with a good portion of the beds covered with a sun-protecting mesh.

The watering system is supplied by existing infrastructure, including a solar-powered submersible pump placed in the well, and a 3 m³ water storage tank. Perforated irrigation pipes were installed above all seedbeds, with adjustable water pressure allowing precise control of water delivery to seedlings. This infrastructure substantially reduces the physical workload associated with manual watering, particularly during the dry season, and



Drip irrigation system for young plants in the nursery.



enables Vahatra to maintain a small and stable workforce, while sustaining high levels of seedling production.

6. Installation of permanent monitoring parcels for endangered trees

Vahatra's program for the conservation of threatened tree species, supported by the Franklinia Foundation and CEPF, aims to grow seedlings in the nursery and integrate these in the ecological restoration plots. Within this framework, Vahatra located and monitored in the remaining natural forests of Ambohitantely mature individuals of the 18 target species and mapped their distribution.

For ecological monitoring, five naturally growing individuals per species were selected as a representative sample to assess habitat aspects and to collect phenological data using a network of permanent monitoring plots within the forest. In total, 90 plots were established and physically demarcated. Monitoring protocols were shared with representatives of local communities, who are responsible for the monthly collection of ecological

and phenological data. This information is used as sort of a biological blueprint to design the species and order of planting in the plots.

7. Grievance collection mechanism

Ecological restoration in the Ambohitantely Special Reserve is implemented through close collaboration with key stakeholders, including local communities and regional governmental authorities. Within this framework, transparency in the execution of project activities is critical for maintaining stakeholder trust and ensuring the long-term sustainability of Vahatra's interventions. To support this objective, Vahatra has established a grievance collection and management system aligned with the regulatory structures governing protected areas and in accordance with donor requirements, represented by CEPF. Individuals wishing to submit a request, complaint, or suggestion regarding Vahatra's activities at Ambohitantely can do so through several channels:

- The offices of their local *fokontany* (governmental structure at the village level),

- The Madagascar National Parks office at Ambohitantely, or
- The forest cantonment chief office in Ankazobe.

These administrative and reserve management authorities record all submissions and, when appropriate, convene the Vahatra team to review the issue and jointly identify suitable solutions. In addition, complainants have the option to contact CEPF representatives directly, with contact information publicly displayed in the different offices mentioned above. In 2025, no grievances have been recorded.

8. Eradication of pine trees

The Ambohitantely Special Reserve is currently the subject of an invasion of introduced pine trees in both open habitats and forested areas. These invasive exotics compete directly with native plant communities, alter soil physicochemical properties—particularly through nutrient depletion—and exert negative impacts on terrestrial and endemic fauna.

With supported from CEPF, Vahatra, in collaboration with Madagascar National Park, has initiated invasive species control efforts across the entire

reserve. This program, which will continue throughout 2026, primarily engages men from villages adjacent to the protected area. The intervention strategy involves felling *Pinus* individuals at ground level, followed by manual removal and destruction of roots to prevent vegetative regrowth. It is noteworthy that prior to the implementation of this reserve-wide project, Vahatra had already conducted periodic control of pines within its core intervention area in the southern portion of the reserve.

9. Ecological restoration to maintain forest block connectivity

The southern block of Ambohitantely, which constitutes Vahatra’s zone of intervention, is now isolated from the main forest block. This is the result of habitat degradation associated with fires and a firebreak installed to protect the main block, leading to the discontinuity of forest cover. Further, the firebreak is also used as an access track by local communities and visitors.

Since early 2025, Vahatra, in collaboration with local communities and Madagascar National Parks, has initiated assisted passive restoration aimed at removing invasive fern species that inhibit the natural regeneration of



Work to increase and maintain forest connectivity. **Left** - planting seedlings in the corridor between the main and southern forest blocks and **right** – preparing the replanting holes in the corridor.

forest taxa based on a dormant soil seed bank within the secondary vegetation formation located between the two blocks. In parallel, tree planting operations have been implemented following active ecological restoration approaches in the open formation with the objective of re-establishing a functional ecological corridor between the main and southern forest blocks. At the current stage, outcomes remain preliminary in light of the extent of the area requiring restoration. During the last quarter of the year, planting activities covered only about 6 ha within this sector.

10. Continue and improve ecological restoration techniques

Going from the idea of learning by doing, Vahatra continues to advance ecological restoration activities at Ambohitantely by building on the experience gained and lessons learned over the past few years. Many of the suggestions shared during the three field school sessions mentioned above



After seedling replanting, growth and survival monitoring is conducted about a month later and done largely by three local employees that include Alain Rasolonjatovo (assistant botanist), Mihajatiana Ravololoniaina (wildlife assistant), and Finaritra Randrianjaka (representative of local communities). Note the vast expanse of anthropogenic grassland that was once forested. In the middle section of the image a firebreak can be seen that protects the restoration area from encroaching fire. Photo taken by drone, December 2025.

were integrated into Vahatra's restoration practices, thereby strengthening the technical capacity and operational know-how of the project. Among the newly adopted practices, mulching has been introduced as a key management tool to reduce substrate evapotranspiration, suppress competing vegetation around planted individuals, and improve soil quality through organic matter inputs.

An important priority for 2025 was the monitoring of restoration activities. Botanical and zoological field assistants, largely local community members, were mobilized to collect data in the restoration plots. This information will be used to assess several aspects, including seedling survival rates and growth dynamics, patterns of animal recolonization within restored areas, and aspects of ecological integrity of the plots as compared to reference forest habitats. For newly established restoration plots, initial survival and growth assessments are conducted one month after seedling planting to evaluate their health and, when necessary, employ adaptive silvicultural interventions. Diurnal and nocturnal faunal surveys are carried out via direct observations along established transects in restoration plots and reference habitats to document the species present. All collected data are consolidated into a centralized database, providing a firm foundation for analyzing regeneration and recolonization evolution, and evaluating the long-term effectiveness of ecosystem restoration efforts.

Other general aspects of Vahatra's work at Ambohitantely

To help better present other activities of Association Vahatra at Ambohitantely, some other aspects are worthwhile to mention.

1. Firebreaks and fire surveillance

Ambohitantely remains highly threatened by recurrent fires. To protect the forest relics and ongoing restoration plots, a fire monitoring system is reinforced each year, particularly during the season of highest occurrence (June to when the rains start normally in late November or early December). Firebreak maintenance has thus become a regular activity, regarded as the most effective solution to prevent the spread of fires from outside into the special reserve forests and restoration plots. This strategy is complemented by surveillance operations jointly conducted by local communities of villagers and the project team. Several fire-fighting backpacks were purchased this year and are available for local use.

All fire outbreaks identified in the surrounding area are immediately reported by the observer (local community members, Madagascar National Parks or Vahatra staff members), allowing the team to quickly organize and contain the fire. Between June and October 2025, the Vahatra team coordinated 11 firefighting interventions and all were brought under control thanks to the combined efforts of local communities and the project's dedicated partners. In 2025, no fires affected the forests within Vahatra's intervention zone. All available equipment was mobilized, and the local communities, benefiting from the ecological restoration project, have become more responsible and better organized to respond effectively to fires in the area.

2. Biological station

Under the guidance of Achille Raselimanana and Jacquis Tahinarivony, a modest and functional field station building was constructed at the site with funds from Save the Rainforest (Sweden) and private donors by a team composed primarily of local workers. The facility has a solar installation which provides all of the electrical needs for the station, including water pumping from a lower source to adjacent storage tanks, sanitary facilities,

tent shelters, and provides significantly improved living conditions for scientists working in the protected area. The station supports different Vahatra research projects, the ecological restoration work, and the storage of equipment between visits. A guest house of sorts has also been constructed for local permanent employees.

In addition to improving research infrastructure, the station plays a vital role in generating income opportunities for local community members. This includes purchasing local food products and employing individuals as cooks, forest guides, porters, helpers, camp managers, field assistants, and for data monitoring. These economic incentives encourage local engagement in forest conservation efforts, which is essential for the long-term preservation of the remaining forests in collaboration with local communities and Madagascar National Parks. The station facilities can be rented by visiting researchers and the associated funds are turned over to Madagascar National Parks for the maintenance of the protected area.

3. Arboretum

The biological station was originally surrounded by secondary grasslands and groves of introduced pine trees. This landscape was redesigned with



In the general vicinity of the station is an area planted with 55 different species of local trees. **Left** – when the installation of the arboretum commenced in June 2024, the area was **with** notably scrubby vegetation and numerous invasive species. **Right** – by late 2025, the trees have increased in size and starting to fill in the space to truly become an arboretum.

the planting of thousands of trees in the form of an arboretum composed of native trees used in the restoration plots, helping to enhance the surrounding space, as well as the removal of the pines to combat invasive species. From June to September, the arboretum was expanded in size to a total of 3.5 hectares and has 55 different species of trees, all native to Madagascar, many endemic, and several considered threatened. To date more than 4500 trees have been planted in the arboretum and the space becomes increasingly green with vegetation. The arboretum is also intended to serve a pedagogic role for visitors, including school kids, to learn about the local native tree species and other aspects.

4. Reforestation and ecological restoration

Choice of planted tree species

The selection of plant species used in our project has evolved over time and, at least in part, associated with the availability of seeds collected from the forest. In 2025, with support from the Franklinia Foundation and CEPF, 19 threatened tree species are integrated into our ecological restoration efforts aiming to recreate something approaching their natural habitat. Currently, Vahatra's nursery center is cultivating 66 species, the seed stock of which from the remaining forests of Ambohitantely and all represent the same genetic pool.

Compost

The soils surrounding the forested areas of Ambohitantely have suffered significant degradation, primarily due to repeated fires that burn organic matter, followed by nutrient leaching associated by heavy seasonal rainfall. To address this issue and promote the rapid growth of planted trees, a large-scale system of producing compost has been implemented. The compost is primarily made from various types of plant debris processed through a grinding machine, mixed with organic fertilizer (cow dung), and watered monthly, particularly during the dry season, to accelerate decomposition. Each compost pit produces up to 48 m³ (1,700 ft³) of compost every five to six months and to date 35 pits have been installed, many in close proximity to the restoration plots. In total, we produce something on the order of 1700 m³ or 59,000 ft³ of compost per year!

Restoration efforts

The Vahatra intervention zone includes 335 hectares in the southern section of the Ambohitantely Special Reserve, primarily adjacent the core forest area. Approximately 120 hectares (36%) remain as relatively intact montane forest, while 64% is degraded or secondary formations. Through GIS technology coupled with ground verification, 81 hectares of degraded areas have been identified as suitable for active ecological restoration, with an additional 134 hectares designated for assisted passive regeneration (see below). The effectiveness of these restoration strategies depends largely on controlling threats, particularly fire.

Assisted passive regeneration

This approach focuses on removing invasive species that hinder regeneration of the natural seed bank in the soil that is today outside the forest limit. It involves manual and notably physical methods, employing machetes and axes, in a cyclical process over the calendar year to clear unwanted vegetation. In 2025, 45 hectares were treated using passive regeneration, primarily targeting an invasive fern (*Dicranopteris linearis*).

Monitoring planted trees

A monitoring team evaluates the evolution of restoration activities. Local community members and students from the University of Antananarivo conduct regular assessments of all trees planted since 2021. Data collected is analyzed by a monitoring coordinator, enabling evaluation of results, identification of areas for improvement, and refinement of intervention techniques.

Survival rates remain consistently high, ranging from 90% to 92% since a given seedling tree was replanted in the plots. Some trees planted in January 2022 have already reached 1.5 meters on average in height, while trees planted in another plot in January 2024 have grown to 0.5 to 1 meter. This ongoing monitoring ensures the project remains adaptive, evidence-based, and aligned with long-term restoration goals.

Broad overview of activities at Ambohitantely

The conceptual framework of ecological restoration, established in the first phase of the project, remains the guiding aspect of the tree-planting interventions of Vahatra at Ambohitantely. The major achievements in 2025

include an increase in production of young plants within the nursery center for transplanting, a drip-feed watering system in the nursery seedling beds, as well as augmenting the surface areas of the restoration plots. The care this project takes to correctly plant trees, specifically the use of compost to increase survival and growth rates, and monitoring the individual trees through time is what separates our work from all other reforestation projects we are familiar with on Madagascar.

FIELD SCHOOL IN THE MANTADIA NATIONAL PARK

During 2025, Association Vahatra held a field school in the Mantadia National Park, about a four-hour drive from Antananarivo, and at a forest camp site. This took place from 23 October to 6 November 2025 and was financed by a grant from Oppenheimer Generations (see below “Current Vahatra Projects and Grants”). Nine Master’s students from Mention Zoologie et Biodiversité Animale, two people working for Madagascar National Parks, and five fellows coming from surrounding communities took part in the field school. For the Master’s students, they had largely completed their coursework and close to deciding the subject for their research memoirs. During the field school, the participants were divided in several rotating groups, presented by different specialists, including those on plants (with an emphasis on



measuring aspects of vegetation structure and species diversity), reptiles and amphibians, birds, small mammals, and bats; for the different animal groups there was a focus on aspects of ecology, capture and manipulation, identification, and zoonotic disease research.



During the field school at Mantadia, students had real hands on experience, for example, **left** - manipulating and counting the scales of a large boa and **right** – learning to identify forest plants and make herbarium collections.

Field school activities included a standard inventory of two different forested zones, within the national park, one in a relatively undisturbed section and the other in a mixture of heavily disturbed and regenerating forest. The two areas are contiguous and provide a setting to understand the possible dynamics of forest animals adapting to different levels of human disturbance. Hence, we were able to simultaneously use the field school to conduct a research project, and these aspects were part of the pedagogic experience for the students.

This style of field school serves several important functions. Firstly, introducing the students to real hands-on activities outside of a largely theoretical classroom context, and allowing them to understand aspects of conducting field research for a variety of organisms. This constitutes a major step for their graduate studies by helping them to decide on the subject and group they will focus on. Secondly, on the side of Vahatra, field schools act as an important filtering process for the young Master's students to be possibly invited to conduct their studies under the direction of a Vahatra scientist. After spending some extended time with a group of students in a field setting, based on their level of interest, curiosity, and intellectual capacity, it



At the end of the field school each participating student made a presentation on their prospective Master's research project. This helped them envision and construct their ideas based on information gleaned and lessons learned during the field school.

is evident which are the best candidates to potentially receive the mentorship of Vahatra scientists or being able to make solid recommendations to other collaborators on Master's students they might consider. The last full day of the field school and based on information they gained, each student made a short presentation of a project they might conduct for their Master's research project, concentrating on hypotheses, site, organism, and techniques to be used.

VOAHANGY SOARIMALALA RECEIVES SEVERAL HONORS AND HONORARY APPOINTMENTS

As a sign of her scientific advancements, Voahangy Soarimalala has recently been bestowed with two honorary appointments. The first is being named as a Research Associate in the Mammal Department at the Field Museum of Natural History in Chicago. This was based with her achievements in advancing systematic studies of Malagasy small mammals over the past decades, including the description of numerous new species to science.

The second was being named Adjunct Associate Professor at Duke Global Health Institute, Duke University. This appointment is linked with the important role she plays in organizing and participating in a large-scale One Health project in the SAVA Region (northeastern Madagascar), specifically on and around the Marojejy Massif (see below).

INTERNATIONAL PRIMATOLOGICAL SOCIETY CONFERENCE

Between 20 and 25 July 2025, the 30th International Primatological Society (IPS) conference took place in Antananarivo, Madagascar. The meeting was attended by 759 registered individuals, in addition to the 133 that join on line, and a total of 749 presentations were made, with up to four concurrent sessions during portions of the meeting. Of the participants, 32% were from Africa (a majority being Malagasy), 25% from North America, 18% from Asia, 15% from Europe, 9% from Central and South America, and 1% from Australia.

The IPS conference is held every two years in a different country and the last time it took place in Madagascar was in 1998, a period the island nation

was still emerging from some very dark years. The 1998 and 2025 meetings were remarkably different from one another. The 1998 conference took place at The University of Antananarivo built by the French in the 1960s, was attended by about 500 primatologists from 35 different countries, and represented a very major national and largely unprecedented event for the island's scientific community, let alone for people traveling from overseas to discover the infamous island and its primates. For the earlier meeting, months before the event took place it was necessary to construct or revamp the university toilet system, repair chairs in the lecture halls, as well as electrical wire infrastructure of different rooms that the meeting would take place. Many of the presentations, particularly by Malagasy primatologists, were in French, and this was before the power point era and with 35 mm



The Local Organization Committee of the 30th IPS. From left to right: Soamalala Rakoto, Tim Eppley, Sylviane Volampeno, Steve Goodman, Josia Razafindramanana, Jonah Ratsimbazafy, and Joelisoa Ratsirarson.

slides or plastic overheads. In any case, the 1998 meeting unfolded in a manner that was memorable for the attendees, including field trips to forested areas to see lemurs and the remarkable biodiversity of Madagascar.

The recent meeting was held at a relatively up-scale and recently built hotel with an associated conference center in Antananarivo with lots of useful infrastructure, such as large electrical generators that started nearly instantaneously when there was a general neighborhood power cut, a range of different rooms with modern presentation infrastructure and high speed and very functional internet access, large meeting spaces for social events, and functional bathrooms! Not to mention fine and copious Malagasy and European food served in buffet style. There were a large number of field excursions before and after the meeting to different sites on the island and facilitated by infrastructure installed in the past couple of decades.

Another difference that is important to mention between the two IPS conferences held in Antananarivo was the large number of Malagasy primatologists that attended the 2025 meeting, including students and researchers, and all presentations (oral and posters) were in English. In total, something on the order of 210 Malagasy researchers were present and for the vast majority, their round-trip travel expenses for those not living in Antananarivo, registration fees, local housing and transport, etc. were covered. The closing ceremony of the meeting was a memorable occasion, the members of the local organizing committee and several national and international primatologists were honored by the Minister of the Environment. Thereafter was the closing evening bash – a great event for those that can remember it.

CURRENT VAHATRA PROJECTS AND GRANTS

Duke University/National Institute of Health and the National Science Foundation – land use in the SAVA Region and global health challenges

This project is associated with grants awarded to Duke University, with Dr. Charles Nunn as the Principal Investigator, and that started in 2019 with financing from the Ecology and Evolution of Infectious Diseases (EEID) program, a joint initiative between the National Institute of Health (NIH) and the National Science Foundation (NSF). This large-scale project aims to understand the linkages between diseases circulating in the foothills of

the Marojejy Massif in northeastern Madagascar across a habitat mosaic of native forest, agricultural areas, and near villages where endemic and introduced (including domestic) animals may act as reservoirs and the source of transmission. Association Vahatra is one of the many collaborating organizations and our contribution is the capture and identification of bats, endemic and introduced small mammals, and collecting the needed samples for the zoonotic disease analyses. After 11 field sessions, which included a considerable effort for the multi-disciplinary team, the field studies for the first phase ended in late 2021. An extension was received from the granting agencies for some follow-up work at two of the study sites, which took place in early 2022.

Subsequently, additional funding was received from NSF (EEID program) and the project enters into a new phase of four years. Dr. Toky Randriamoria, a post-doc at Vahatra, is responsible for the field sampling and seconded by Voahangy and Steve. Further, an assistant, Rianja Nantenaina Randriamifidisoa, was engaged to reinforce the group, together with numerous local collaborators from northern Madagascar and villages



neighboring Marojejy. A Ph.D. student working with Vahatra scientists, Fanasina Rakotoarisoa, was engaged to study the ecology of rodents, specifically aspects of their home ranges and the invertebrates in their nesting holes. Numerous other specialists in different research domains and from different institutions in the USA, France (La Réunion), Israel, and Singapore, are studying multiple facets of local circulating zoonotic diseases and parasites, and using a range of different advance techniques, including molecular, network analyses, and modeling tools. This research project aims to study novel methods to predict disease spread, particularly different infectious diseases being important human health concerns on Madagascar. In June 2025, all of the different collaborators met in Colorado Springs for a meeting to discuss results and future directions.

Since 2023, the field portion of the project has three sessions per year, including capture of mammals in forest, agricultural settings, and houses,



In June 2025, the different investigators met in Colorado Springs to discuss different aspects of this project. Here is shown Toky Randriamoria, a post-doc at Vahatra associated with the small mammal fieldwork, making a presentation on the associated database.

to monitor any evolution in local zoonotic diseases, and with continuous engagement with local community members. This nearly continuous presence of the field teams has strengthened collaboration with local institutions, supported adaptive project implementation, and facilitated ongoing exchanges of knowledge and feedback. In addition to these field missions, in July 2025 a community meeting was organized in a village at the foot of Marojejy to present preliminary results, raise awareness of the project's objectives, and actively involve community members in discussions related to conservation, zoonosis diseases, land use change, and local environmental challenges. A fresco painting event for local kids was also organized. These combined efforts have contributed to building trust with local stakeholders and authorities, and reinforcing community participation in the long-term project.



A community meeting was held in Mandena at the foot of the Marojejy Massif to explain different aspects about this project. One activity for local children was to paint a biodiversity related mural.

Save the Rainforest Sweden (Rädda Regnskog) project at Ambohitantely

The Ambohitantely Special Reserve is one of the last remnant Central Highland montane forests on the island and it is of high priority to conserve. This fragile and vulnerable relict forest is home to a relatively rich and unique flora and fauna. Since 2007, Association Vahatra has organized at the site regular research missions, field schools in the form of ecological and biological training for students, as well as for conservation agents and managers.

Over the past decades, the anthropogenic pressures of largely human-set grassland fires in the Central Highlands, which enter and burn portions of the remaining natural forest, the number of forest parcels at Ambohitantely and their surface areas have been dramatically reduced or completely disappeared. In a collaborative project between Association Vahatra and Madagascar National Parks, the organization responsible for the management of the protected area, and with funding from Save the Rainforest Sweden, we have taken steps to try to conserve Ambohitantely and with the active involvement of local villagers. In 2024, Save the Rainforest Sweden provided additional funding for phase 3 of the project for a 12-month period. The Ambohitantely project is discussed in detail in an earlier section of this report.

Franklinia/Critical Ecosystem Partnership Fund (CEPF)

This project under the grant title, “Protecting threatened trees through ecological restoration at Ambohitantely” is financed with funds from the Franklinia Foundation and administered by CEPF. The project is in collaboration with Madagascar National Parks and villagers living around the protected area. The principal aspects, focusing on 19 tree species that occur at Ambohitantely are:

1. **Gather scientific data on threatened tree** species and more specifically obtaining a comprehensive understanding of the ecological characteristics and requirements of these species within the protected area.
2. **Conservation of target tree species**, and implementing tangible actions to protect and preserve populations of focal species, including growing young trees from seed in the nursery and planting them in ecological restoration parcels.

3. Involving neighboring community members in the protection and conservation of threatened trees, which involves raising local awareness and actively engaging communities in safeguarding threatened trees by educating them about their ecological importance and encouraging their participation in conservation efforts.

Critical Ecosystem Partnership Fund (CEPF)

Over the past years, Association Vahatra has advanced different aspects of growing and planting trees to move towards forest ecological restoration, including the development of several very efficient techniques (see section above “Vahatra’s ecological restoration project at Ambohitantely” for some of the details). This two year project aims at the dissemination of information on forest ecological restoration and monitoring in the Central Highlands of Madagascar and ameliorating silviculture techniques for different conservation organizations.



In early 2025 and with support from CEPF, Association Vahatra held a series of field schools at Ambohitantely for individuals representing different civil society organizations on Madagascar, particularly those involved in reforestation and forest ecological restoration projects. The group that attended the first session is shown here in front of the biological station.

In early 2025, two field schools were held at Ambohitantely, each for four days at the site, which included individuals working for different civil society organizations on Madagascar involved in reforestation and forest ecological restoration. The principal exchanges involved sharing of aspects they have developed associated with their projects and also demonstrating to them the techniques Association Vahatra has developed on site. The third field school, a day-visit to the site for non-governmental and governmental organizations interested in a general manner in reforestation and based in Antananarivo or the general Ambohitantely area, was to explain Vahatra ecological restoration activities in the protected area.

The fourth field school, planned for the later portion of the year for a small group of individuals chosen from the first two field schools that demonstrated keen interest in ecological restoration and monitoring, and for them to take part in a full-scale biological inventory associated with faunal and floral ecological monitoring of Ambohitantely and the local forest restoration sites. This was scheduled for early October, which coincided with civil demonstrations in Antananarivo and other major population centers on the island (see above “Large-scale demonstrations in Antananarivo”). It was necessary to postpone this field school, which is now planned from late January to early February 2026.

Hempel Foundation in collaboration with the Fondation pour les Aires Protégées et la Biodiversité de Madagascar (FAPBM)

The intent of this one-year project was to improve infrastructure associated with Vahatra’s ecological restoration activities at Ambohitantely. In more specific terms: 1) maintenance and construction of new composting pits, 2) installation of an automatic watering system in the nursery, 3) installation of permanent monitoring plots, 4) construction of germination boxes, 5) installation of a new ecological restoration plot, and 6) refurbishing of dormitory for local workers and different needed furniture. All of these different aspects were achieved.

Ministry of Science and Technology of the People’s Republic of China

This project, led by Dr. *Jingtao Li* of the Oujian Laboratory, Zhejiang, PRC, is to conduct joint China-Madagascar research on the endemic rodents



In May 2025, Voahangy and Steve traveled to China to meet their collaborator, Jingtao Li, from the Oujiang Laboratory associated with a project on genomics of endemic Malagasy rodents.

(subfamily Nesomyinae) of Madagascar. Steve and Voahangy visited the Oujiang Laboratory in May to meet with the collaborator and deliver the first frozen tissue samples for genomic work. As Madagascar for most Chinese citizens is largely or completely unknown, Jingtao organized an exhibit about Malagasy biodiversity and the work of Vahatra, which was also visited by local school pupils.

The grant from the Chinese Government is for three years, ending in November 2028. The main foci in collaboration with students and researchers at the Université d'Antananarivo and Association Vahatra are to 1) establish a modern and self-sufficient molecular and cell laboratory at the university, including all of the energy needs coming from solar energy and with an emergency generator; 2) study genomic DNA aspects in all of the nine genera and at least 20 species of Nesomyinae rodents; 3) creation of a captive rodent lab, and 4) document at the cellular level the process of how rodents of the genus *Eliurus* are able to regenerate the terminal tail tuft



Our colleague at the Oujiang Laboratory, Jingtao Li, organized a photographic exhibit in the main entrance hall of the institute on Malagasy biodiversity and the work of Vahatra. Here is shown Voahangy in front of a poster explaining her work and activities.

after being naturally cut (accidents or the results of close predation events). A substantial portion of the allocated budget will be used to establish the lab, buy and import a considerable amount of equipment, and funds for fieldwork, student projects, field schools, and local workshops. Further, four Malagasy scholars and students will travel to China for laboratory training and research. The project starts in early 2026.

Oppenheimer Generations

Vahatra received a three-year grant from Oppenheimer Generations to cover the costs of a field school each year for groups of young Malagasy graduate students from the Université d'Antananarivo. We have been conducting this type annual field school for many decades and they can be critical, in the sense of a watershed moment, to help guide young students to pick the group they will study for their graduate work and the types of questions to be asked.



During the field school that involved local villagers, staff from Madagascar National Parks, Vahatra scientists and nine Master's students from the Université d'Antananarivo. The gentleman in the middle of the backrow with the brown shirt and glasses is the local director of the protected area. He came out to have an open discussion with the students about the ins and outs of managing the park.

Also, the interactions between the students and Vahatra scientists allows us pick which students will be brought into our development and mentoring programs based on their intellectual curiosity and performance in the field. During field schools, a range of different presentations were made, including by local villagers on their views of conservation and different Madagascar National Parks personnel. The first Oppenheimer Generations field school was held in from 23 October to 6 November 2025 in the Mantadia National Park (see above, "Field School in the Mantadia National Park").

Wellcome Trust

This project is the continuation of one that was named REDROZ (Reduce Rodent Zoonosis), which was financed by Global Challenges Research Fund (GCRF), United Kingdom Research and Innovation (UKRI). The REDROZ project aims to reduce the risk of rodent-borne infections (leptospirosis,

plague, and rickettsiosis) in Africa, including Madagascar, by increasing knowledge and expertise needed to develop holistic rodent management that can be applied based on local conditions and at the community level. Research is designed to answer whether sustainable community-based rodent management can reduce risks of disease transmission and improve overall human health and well-being. This new project is financed by the Wellcome Trust.

The study is in collaboration with Institut Pasteur de Madagascar (IPM) and Association Vahatra. A student from The University of Antananarivo and part of Vahatra, Todisoa Radovimiandrinarany, is integrated in the project in the context of his Ph.D. research, and one other PhD student from The University of Fianarantsoa has taken part in the project. The focus of the work is in four villages within Analavory/Miarinarivo commune (Central Highlands to the west of Antananarivo), where agricultural areas act as experimental replicates, providing the means to test how rodent movements and the prevalence of rodent-borne infections are impacted by control. A range of qualitative and quantitative social science techniques are employed to produce a deeper understanding of community practices, behavior, and understanding around relevant issues of health, field hygiene, and pest management, and work with stakeholders from health, agriculture, and environment spheres to understand their perceptions, policies, and support services.

BEPREP Project

BEPREP (Best Practices for Biodiversity Recovery and Public Health Interventions) aims to elucidate the role of undisturbed and restored biodiversity in mitigating threats to health security from zoonotic and vector-borne diseases along the infect-shed-spill-spread cascade, in order to identify best practices for nature restoration, including rewilding. The design of this research project, funded by the European Commission, is to identify and characterize these aspects in natural forest, degraded, and restored habitats, using live-capture traps to examine the presence and population dynamics of small mammals. Research designed for Africa, including Madagascar, includes the collection of biological samples from possible small mammal reservoirs and invertebrate vectors to characterize novel and established pathogen networks. The traits and interactions of pathogens, vectors, and reservoirs that contribute to increased disease risk and spread to test if ecosystem restoration by rewilding can recover biodiversity and mitigate disease risk (e.g., by reducing population size of

introduced rodent reservoirs). Study sites on Madagascar are Ankafobe and Ambohitantely Special Reserve in the Central Highlands (both montane humid forest fragments), and Ankarabolava and Agnakatrika in the southeast (both lowland moist evergreen forest fragments). A Ph.D. student from the University of Antananarivo and associated with Vahatra, Salohy Ravelotafita, is integrated in this project in the context of her thesis. In 2025, two sessions of small mammal and mosquito trapping were conducted at the four sites.

Wildlife Conservation Society/Association Vahatra: Multidisciplinary biological inventory of the Parc Naturel de Makira

The Parc Naturel de Makira, located in the northeast of Madagascar, is the island's largest protected area, with a surface area of 374,083 hectares. It includes moist evergreen humid forest, notably a large area of lowland forest

on the eastern slope, and a mid-elevation moist evergreen forest, as well as wetland ecosystems. Due to its geographical position in relation to other protected areas in the northeast and east of Madagascar, this park plays a major role as a biological corridor, linking different protected areas, and, in turn, ensuring the long-term conservation of the biodiversity in this portion of the island.

Despite various biodiversity studies carried out in the protected area over the past decade or so, specifically the eastern portion, the park remains scientifically poorly known. However, the management of this protected area requires regular ecological research and monitoring, as well as the most comprehensive information possible to guide the conservation efforts of the Wildlife Conservation Society (WCS), the park manager, and its partners. WCS commissioned Association Vahatra to carry out an eco-biological inventory at four different sites in the poorly known western part of the protected area, which were completed in late 2025.



In collaboration with WCS, Association Vahatra conducted biological inventories at four sites in the Makira, the largest protected area on Madagascar. Logistics were rather complicated to get into remote sites. **Left** – certain displacements involved more than 60 porters, necessary to carry all of the needed equipment and provisions. **Right** – field camps were installed within the largely pristine forests.

This was a large-scale organizational and logistical exercise, with reconnaissance trips, and the long-distance treks were a major challenge during the field missions. The camps were notably far apart, and displacements to reach each site in certain cases required after days of driving from Antananarivo, four hours by motorcycle taxi, and at least six hours to several days walking on difficult trails. During each displacement, over 60 porters worked with the team to carry gear, supplies and food. Vahatra and his colleagues are currently finalizing the fieldwork report. Together with other researchers who have been worked in the park, we will produce a scientific monograph on the protected area that will be published as a special issue of *Malagasy Nature*, and will be available in the near future.

WITH A SPECIAL THANKS

We would like to extend a special thanks to a number of individuals that have financially supported Vahatra projects in 2025, including the advancement of Malagasy graduate students and a range of other activities, such as the “Ecotourism guides to protected areas” series. The list is ordered alphabetically by family name:

- Asisten Travel Madagascar
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- Alexander Lapidus
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- Jai Shekhawat
- Cheryl & John Susman
- Tom Will

NEW SPECIES DESCRIBED IN 2025 BY VAHATRA SCIENTISTS

One of the direct results of the biological inventories conducted by Vahatra and associated collection of specimens, is the discovery of species previously unknown to science. In 2025, Vahatra scientists were involved in the descriptions of the following new species from Madagascar. Author names in **bold** are those of Vahatra scientists.

1. A new genus and species of fossil bat dating from the Miocene, *Madanycteris razana* – Samonds, K. E., Gunnell, G. F., **Goodman, S. M.**, Alumbaugh, J. L., Hand, S. J., Irwin, M. T., Rasolofomanana, N. & Simmons, N. B. 2025. Oldest record of Cenozoic terrestrial vertebrates (Chiroptera) from Madagascar. *Journal of Vertebrate Paleontology*, 44(5). <https://doi.org/10.1080/02724634.2025.2488447>.
2. A new species of plant – Boluda, C. G. & **Tahinarivony, J. A.** 2025. *Cyanotis natalia*, a new Malagasy species of Commelinaceae with turion-like shoots. *Candollea*, 80(2): 213-220.
3. A new species of frog – Petzold, A., Glaw, F., Mullin, K. E., Rakotoarison, A., **Raselimanana, A. P.**, Crottini, A., Orozco-ter Wengel, P., Köhler, J., Prötzel, D., Vences, M., Hofreiter, M. & Scherz, M. D. 2025. A preliminary assessment of the diversity in the frog genus *Anilany* (Microhylidae: Cophylinae) with description of a new species from western Madagascar. *Salamandra*, 61(1): 70-94.
4. A new species of gecko – Vences, M., Miralles, A., Ineich, I., Rakotoarison, A., Glasenapp, C., Scherz, M. D., Köhler, J., Glaw, F. & **Raselimanana, A. P.** 2025. An updated survey of molecular diversity in Madagascar’s velvet geckos, genus *Blaesodactylus*, with description of a new species from the island’s arid West. *Zootaxa*, 5620(2): 230-254.

SCIENTIFIC OUTPUTS OF VAHATRA DURING 2025

The year 2025 was a productive one for Vahatra scientists and students concerning scientific publications. Below we present a list of articles and books published during the year, including manuscripts in press and submitted. Names in bold are those of Vahatra scientific members, and those in italics are current or past Malagasy student members, associated with work they conducted while at Vahatra, as well as post-docs.

1. Andriamamonjy, M. H., Rakotomavo, Z., Geizer, L. & *Marline, L.* 2025. Temporal and spatial variation of PM2.5 in Antananarivo, the capital city of Madagascar.

- Aerosol and Air Quality Research*, 25, 50. <https://doi.org/10.1007/s44408-025-00039-5>
2. Apanaskevich, D. A., Finley, M. C. & **Goodman, S. M.** Submitted. First description of the male and redescription of the female of *Ixodes lunatus* Neumann, 1907 (Acari: Ixodidae), parasite of tenrecs and rodents in Madagascar. *Systematic Parasitology*.
 3. Apanaskevich, D. A., Greiman, S. E. **Goodman, S. M.**, Apanaskevich, M. A., Ahmed, R. & Barker, S. C. 2025. Validation of *Sharifiella* Santos Dias, 1958 (Acari: Ixodidae) as a genus of hard ticks containing *S. theileriae* (Hoogstraal, 1953), a parasite of tail-less tenrec, *Tenrec ecaudatus* (Schreber) (Afrosoricida: Tenrecidae) on Madagascar. *Zootaxa*, 5627(3): 503-52.
 4. Boluda, C. G. & **Tahinarivony, J. A.** 2025. *Cyanotis natalia*, a new Malagasy species of Commelinaceae with turion-like shoots. *Candollea*, 80(2): 213-220.
 5. Barrett, T. M., **Soarimalala, V.**, Pender, M., Kramer, R. A. & Nunn, C. L. 2025. Climate change perceptions and adaptive behavior among smallholder farmers in northeast Madagascar. *PLoS Climate*, 4(3): e0000501. <https://doi.org/10.1371/journal.pclm.0000501>
 6. Briones, S., Mason-Gamer, R., **Goodman, S. M.**, Demos, T. C., Webala, P. W. & Patterson, B. D. Submitted. Adaptive radiation in *Miniopterus*? Effects of competitive milieu on ecomorphological divergence. *Ecology and Evolution*.
 7. Carcauzon, V., Cordonin, C., Sebbane, F., **Soarimalala, V.**, **Goodman, S. M.** & Tortosa, P. 2025. Malagasy flea microbiota results from a combination of vertically transmitted and environmentally acquired microbes. *Scientific Reports*, 15: 8461.
 8. Carcauzon, V., Laudisoit, A., Slavin, P., **Goodman, S. M.**, Sebbane, F. & Tortosa, P. In press. Emergence, global dispersal, and local adaptations of *Yersinia pestis*, the agent of plague. *Applied and Environmental Microbiology*.
 9. Carcauzon, V., **Soarimalala, V.**, Apanaskevich, D. A., Ramihangihajason, T. R., Harimalala, M., Sebbane, F., **Goodman, S. M.** & Tortosa, P. Submitted. Hibernating wildlife species and their role in maintaining Madagascar's sylvatic plague. *Communications Biology*.
 10. Clark, V. R., **Goodman, S. M.**, le Roux, J., Ratsoavina, F. M., Rakotoarinivo, M., Taylor, P. J., **Soarimalala, V.** & Rakotoarivelo, A. R. 2025. The Malagasy Mountain Programme: Understanding Madagascar's high-elevation systems under global change. *Mountain Research and Development*, 45(1): P6-P11.
 11. Crowley, B. E. & **Goodman, S. M.** 2025. Investigating foraging niches for tenrecs, bats, and rodents at Betampona Réserve Naturelle Intégrale (central eastern Madagascar) using stable carbon and nitrogen isotopes in fur and bone. *Animals*, 15: 2423.
 12. Dubrulle, J., Kauffman, K., **Soarimalala, V.**, *Randriamoria, T.*, **Goodman, S. M.**, Herrera, J., Nunn, C. L. & Tortosa, P. 2025. Effect of habitat degradation on Hantavirus infection among introduced and endemic small mammals of Madagascar. *Ecology and Evolution*, 15: e70914.
 13. Espinaze, M.P.A., Rahelinirina, S., *Radovimiandrinifary, T.*, Andriamiarimanana, M. F., Andrianarisoa, A. B., **Soarimalala, V.**, Scobie, K., Harimalala, M., Rajerison, M., Belmain, S. B. & Telfer, S. 2025. Community-led intensive trapping reduces abundance of key plague reservoir and flea vector. *Tropical Medicine Health* 53: 67. <https://doi.org/10.1186/s41182-025-00746-0>
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 16. **Goodman, S. M.** & **Soarimalala, V.** 2025. The non-primate and non-volant mammals of the Andrafiarena-Andavakoera protected area. In A floral and faunal inventory of the Andrafiarena-Andavakoera protected area of northern Madagascar, eds. S. M. Goodman & J. A. Tahinarivony. *Malagasy Nature*, 19: 191-205.
 17. **Goodman, S. M.** & **Tahinarivony, J. A.** eds. 2025. A floral and faunal inventory of the Andrafiarena-Andavakoera protected area of northern Madagascar. *Malagasy Nature*, 19: 1-242.
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 19. **Goodman, S. M.**, *Razafindranosy, L. V.* & *Cleasman, A.* 2025. The bats of Andrafiarena-Andavakoera protected area. In A floral and faunal inventory of the Andrafiarena-Andavakoera protected area of northern Madagascar, eds. S. M. Goodman & J. A. Tahinarivony. *Malagasy Nature*, 19: 206-218.
 20. **Goodman, S. M.**, Segami, J. C. & Hyde Roberts, S. In press. The diet of two species of *Tyto* in southeastern Madagascar. *Malagasy Nature*, 20.
 21. **Goodman, S. M.**, Mathieu, E., Patel, E., **Raherilalao, M. J.** & Wohlhauser, S. In press. *Les aires protégées de Marojejy et Anjanaharibe-Sud dans le Nord-est de Madagascar / The protected areas of Marojejy and Anjanaharibe-Sud in northeastern Madagascar*. Antananarivo, Association Vahatra Press.
 22. Ibouroi, M. T., Waldien, D. L., Soulé, M., Oedin, M., Lebarbenchon, C. & **Goodman, S. M.** 2025. Population collapse and habitat loss in the Comoros

- Flying-Fox after Cyclone Chido: Urgent conservation priorities. *Journal of Nature Conservation*, 88: 127064.
23. Ildard, B., **Soarimalala, V., Goodman, S. M.** & Jansa, S. In press. Complete species-level phylogeny of Madagascar's tufted-tailed rats, *Eliurus* (Rodentia: Nesomyidae) reveals hidden diversity. *Zoological Journal of the Linnean Society*.
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 34. **Raherilalao, M. J. & Goodman, S. M.** 2025. Communauté d'oiseaux et importance biogéographique du Paysage Harmonieux Protégé d'Andrafiomena-Andavakoera, Nord de Madagascar. In A floral and faunal inventory of the Andrafiomena-Andavakoera protected area of northern Madagascar, eds. S. M. Goodman & J. A. Tahinarivony. *Malagasy Nature*, 19: 175-190.
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AMBOHITANTELY
Tetikasa famerenana ny ala, hikeloina ny tontolo iainana

*Mamboly hazo aho,
ho an'ny
Zanako rahampitso*

AHY
ANAO
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