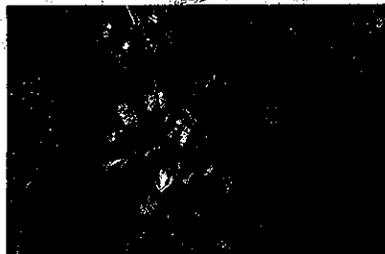
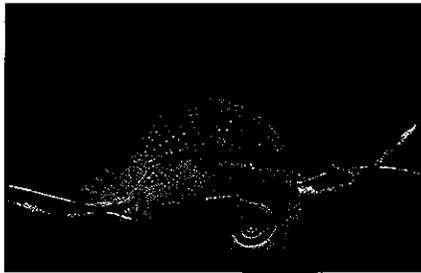


*FN-AM-411*

# Ranomafana National Park Project





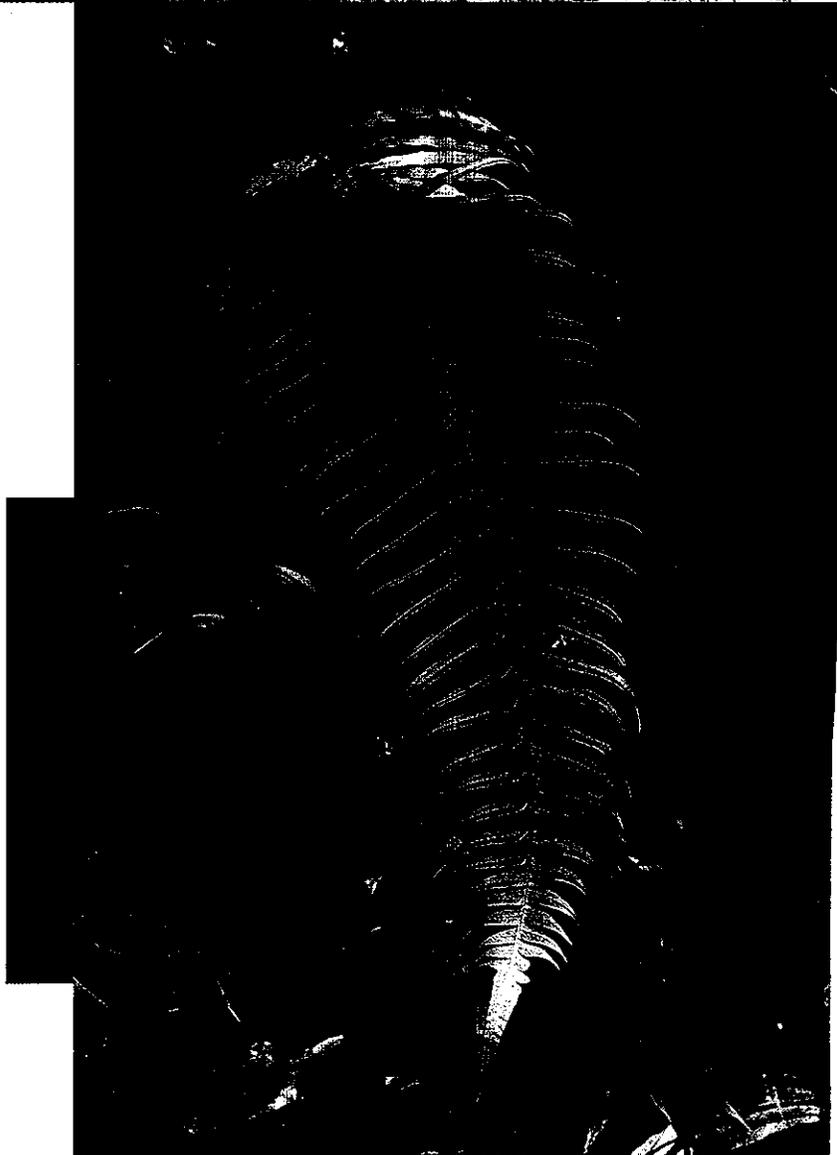
## The Ranomafana National Park Project

began in 1986 with the discovery of a new lemur species. Under the umbrella of the 15-year Environmental Action Plan, the RNPP is one of the conservation projects coordinated by ANGAP to preserve the natural resource heritage of Madagascar. This is our last chance to save the biological treasures of Madagascar. It is the last chance for the people who live next to these treasured rainforests to secure them as part of their culture. It is the last chance for all of us to preserve the extraordinary diversity of life as part of our biological heritage.

To make it happen we have combined our skills so that together the forest and the people benefit; so that there will never be a last chance to see the forest. This has been a complex and challenging program. Please help us to continue this challenge.

Benjamin Andriamihaja  
National Coordinator RNPP

Patricia C. Wright  
International Coordinator, RNPP



# Ranomafana National Park Project

The Ranomafana National Park Project (RNPP) is a consortium of institutions working toward the conservation and sustainable development of natural resources in and around Ranomafana, in the southeastern region of Madagascar. Comprised of the Association Nationale pour la Gestion des Aires Protégées (ANGAP), the Institute for the Conservation of Tropical Environments (ICTE) at the State University of New York at Stony Brook, Duke University and Cornell University, RNPP is working collaboratively with the Malagasy Government to stem the unsustainable use of the region's natural resources and to preserve its biological diversity.

As a result of efforts by the RNPP and with funding from the United States Agency for International Development (USAID), on May 31, 1991 the Government of Madagascar officially declared Ranomafana National Park and sanctioned the creation of a long term program of integrated conservation and sustainable development activities in the area. Ranomafana National Park (RNP) contains a biological diversity that is unique, including twelve species of lemurs, rare carnivore species, and over one third of Madagascar's bird species. In addition, the Ranomafana forest is the primary watershed for the entire southeastern portion of Madagascar. Yet despite these treasures, human land use activities, including slash and burn agriculture

(known as tavy), logging, and livestock ranging, continue to threaten the park. The Malagasy Government has declared preservation of Ranomafana to be of the highest priority because of its high biological diversity and importance to the people of Madagascar.

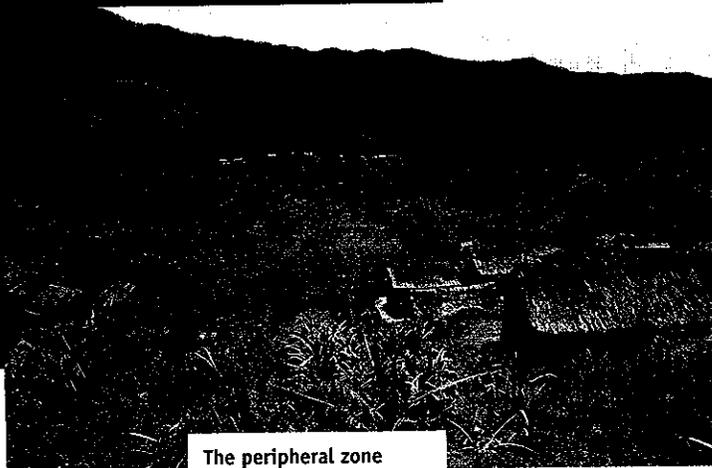
The Ranomafana National Park Project was created with the two-fold purpose of conserving the unique biodiversity of the Ranomafana ecosystem, and reducing the human pressures on the protected area. By linking sustainable management and utilization of natural resources with increased socio-economic levels for residents living around the park, the RNPP is implementing an integrated conservation and development program that holds promise for the future security of the Malagasy people in the area.

During the Project's Phase I planning and design period, baseline socio-economic and biological data were collected. In Phase II, successful on-going activities are continuing, and implementation of specific methods to diminish human pressures on the park are being conducted through the introduction of sustainable agricultural systems, alternative income sources, and the sound management of natural resources by local communities. The Project's four integrated components—conservation, community based development, education, and health—comprise the strategy to link the forest and natural resources to improved socio-economic conditions. Local residents will gain an increased awareness of the importance of natural resources, and also gain incentives for both conservation and implementing sustainable alternatives to deforestation.

On May 31, 1991 the Government of Madagascar officially declared Ranomafana National Park, which encompasses 41,000 hectares of protected rainforest.



Steve Zark



The peripheral zone surrounding the Park contains over 100 small villages.

# Conservation

**R**NPP's conservation activities are directed toward the creation and implementation of a long term protected area management system resulting in the protection of the biological diversity of Ranomafana. The conservation projects are a key link to community based development components of the project. Together these integrated activities will bring about a greater awareness of the value and benefits of protecting natural resources.

A key factor in the success of the RNPP is the design and implementation of an effective long term management plan. This comprehensive plan will incorporate all aspects of Park operation and management: a biodiversity assessment; a vegetation map; visitor use patterns; visitor infrastructure, including trails, campsites, and environmental interpretive materials; research infrastructure; research locations, subjects, results and recommendations; delineation of the various usage zones; and analysis of human use and natural resource limits and constraints. Based on the results and success of other components of the Project, and on the results of the monitoring activities, the management plan will be flexible and responsive to changing needs, to meet the stated goals of conservation and sustainable resource use.

Essential to the design and implementation of conservation activities is the biological monitoring system, which is designed to evaluate natural and human-induced changes in the ecosystem, including the impacts of the Project itself. Serving as a link between individual project components, the biological monitoring system will provide a continuous feedback mechanism upon which to plan Project activities and interventions. The monitoring system is multi-dimensional, combining indigenous knowledge with technologically advanced data collection methods such as remote sensing and GIS. These data will be part of a national database coordinated in Antananarivo by ANGAP.

On-going training is critical to the long-term success of the Project, and RNPP is providing advanced training of professionals and conservation staff at all levels of protected area management, and special training of local people to serve as informed tourist guides. The Project has a unique program for Conservation and Development Agents (ACDs), men and women selected from the local populations and existing project staff. ACDs are central to the success of the project, because they are the link between the protected area and the local communities. They will also play an important role in resource protection by regularly conducting monitoring expeditions, and by working with local residents to engender awareness of the importance of the Park and the conservation of its natural resources.

Biodiversity research is fundamental to the project, yet the objective is not only pure investigation. The Project will



Loret Rasabo has been trained as a research assistant specializing in bird biodiversity. Along with twenty-nine other villagers, he carries out research that includes long term ecological monitoring. Other research assistants study insects, plants, primates and other mammals, reptiles and amphibians.



apply research results to the conservation and development activities, and will integrate these results into the overall management scheme. Funded research is focusing on results that are applicable to conservation initiatives in the protected area, and to the project sectors of education, health, and community development.

Community awareness is vital to the long term success of conservation in the area. The Biodiversity Museum, created by the Project, has established a visitorship of nearly 1,000 people/month, and is the most popular tourist attraction in the Fianarantsoa Province. Closely linked with the Museum's activities are environmental education programs conducted through the Project's Education component.

The conservation of natural resources is linked inextricably with their sustainable utilization. For the first time, the Ranomafana forest is becoming profitable through RNPP project activities rather than through timbering and other destructive exploitation. RNPP is identifying and expanding income generating activities, especially those that provide alternatives to tavy and timber exploitation, which are threats to the ecosystem. By introducing alternative options, local people will be more willing to invest in, manage, and protect their precious natural resources. One of these options is applied forestry techniques, and the Project is instituting a training program for village nursery workers, distributing seeds and making equipment available. By identifying indigenous trees for potential use in reforestation and agroforestry, the Project will develop a comprehensive forest management plan, reforestation and nursery activities, and an agroforestry program to introduce other beneficial tree species. Aquaculture activities will include raising crayfish in ponds as an alternative source of food and income.

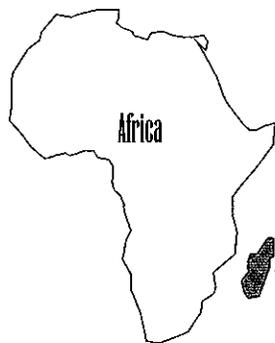
# Madagascar

Madagascar's fauna and flora is among the most diverse in the world, and because of the island's unique evolutionary history most of these species are found nowhere else on earth. The rainforests and cloud forests are of significant environmental and economic importance to the people, providing subsistent forest products and essential watershed protection. Yet, because of destructive land use practices, only 30% of the original forests remain, and deforestation continues because of slash and burn agriculture (known locally as tavy), timber exploitation, uncontrolled ranging of livestock, and other harmful practices. Recognized as one of the poorest countries in the world, Madagascar's population is 90% agrarian, and alternatives to unsustainable forest exploitation for subsistent survival are largely unavailable to the people. With a population growth rate of 3.2% annually, the Malagasy Government long has recognized that protection of the country's remaining forest resources is crucial for the country's future.

The discovery of a new lemur species, *Hapalemur aureus*, in 1986 led to the creation of Ranomafana National Park.



Russell Mittermeier



Ranomafana National Park

# Ecotourism

The Hotel Thermale offers 15 rooms for ecotourists visiting Ranomafana National Park and the hot mineral springs are located nearby.

Ecotourism is a very promising alternative activity for Ranomafana. Emphasizing the development of discovery travel, the tourism plan fosters conservation, actively seeks to protect the resource base, educates the visitor, and is designed to be sustainable. A portion (50%) of the entrance fees to the national park are returned to village communities for conservation projects. At the entrance to the Park a Visitor's Center welcomes tourists with photos of some of the plants and animals they are about to see, and a brochure describing the forest and wildlife. Tourist guides accompany tourists into the forest, pointing out wildlife and also describing the conservation goals of the Project. Visitors have a choice of several campsites. These campsites are run exclusively by local villagers, and 100% of the income goes to the village elders.

RNPP is working to improve rice production by working closely with local communities through a combination of water management, improved seed varieties, and the correct application of fertilizers.

Patrick Daniels

## Community Based Development

The RNPP is providing long, medium and short term technical expertise to promote sustainable development in and around the park, expertise in areas that include agriculture, agroforestry, aquaculture, apiculture, horticulture, and livestock raising. In addition, development activities are also focusing on non-agricultural livelihoods. The Project's community based work will have many benefits for the community and the park. It will: increase agricultural production and reduce the need for expansion of tavy cultivation; 2) diversify sources of food and income for local people; and 3) more evenly distribute income patterns for the local people throughout the year. The Project is taking a flexible approach to sustainable development activities, an approach that will evolve according to community input, changing needs, accumulating expertise and lessons learned.

RNPP is working to improve rice production through a combination of water management, the correct application of fertilizers, and improved seed varieties. Technical staff are also initiating activities in legume cropping and production of small livestock. Phase I research has indicated that improvement of water management alone could increase rice productivity by as much as 80%. However, the major benefit will be the potential for high yield varietal inputs, alternate crops, decreased soil erosion, and a more evenly distributed income pattern because of an increased availability of tillable soils. The Project is providing technical assistance through extension services to advise local people on cropping plans and agricultural management, to establish a way to transfer

information, and to train individuals and local institutions in appropriate technology to conserve the ecosystem.

Cattle play an important role in the lives of local residents, both culturally and as a means of storing and accumulating wealth. The local custom of grazing cattle in the forest, however, may be causing detrimental effects on plant species. The Project is researching this issue, including the potential for establishment of fodder areas outside the Park, and ultimately developing a plan for managing cattle outside the protected area. Project staff also are working to develop small livestock production activities that would be feasible in the Ranomafana climate and terrain, and would be accepted by the local people. In addition to these activities, the Project also is exploring the development of small enterprises in the area. Several artisanal centers provide training in carpentry, leather work, sewing, and other crafts. These unique local craft items are created for marketing locally, nationally, and internationally.

Crayfish from crystal clear undisturbed mountain streams within the Park have been an important cash crop for the Ranomafana region. Crayfish now are grown in aerated ponds in the peripheral zone of the Park, and harvested for sale to restaurants.

Another approach to providing alternatives to tavy and enriching the land is through agroforestry. The Project is focusing on improving fallow and encouraging home orchards. By improving fallow, the tavy cycle should be slowed, resulting in a longer fallow period and higher yield of crops from the fallow. The RNPP wood products program is developing an extension program to assist people in planting trees for fuelwood, and is assessing the impact of subsidizing reforestation on unused lands as a means of reducing future pressure on the park for fuelwood and wood products. The growing of medicinal plants is also a significant benefit. The Project is researching the uses of local medicines, identifying market potential, and investigating a marketing strategy for local medicinal plants with national and international companies, emphasizing an equitable distribution of revenue. The home orchard program is developing a strategy for investigating and satisfying local demands for fruit trees, assessing the demand for orchard products and the market for jellies and jams, and training nursery personnel in grafting techniques.



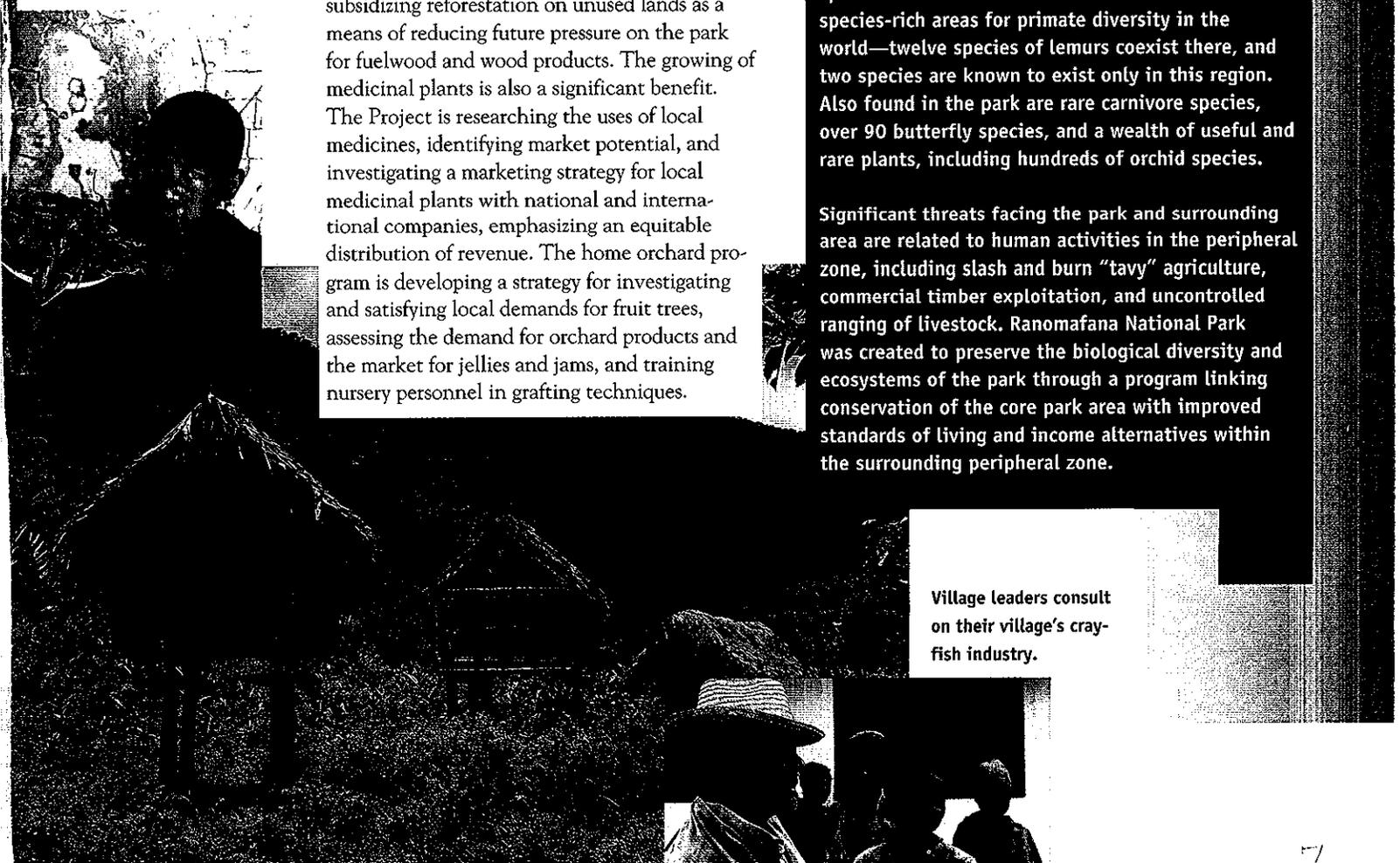
## Ranomafana National Park

**R**anomafana National Park became the fourth national park in Madagascar when it was inaugurated on May 31, 1991. Most of the park area is mountainous and contains relatively undisturbed lowland rainforest, cloud forest and high plateau forest. The core protected area is 41,500 hectares, and the park is surrounded by a peripheral zone which contains more than 100 villages with 25,000 residents. These residents are primarily subsistent farmers dependent on the land, rainforest and rainforest products for survival.

The name Ranomafana, which means hot water in Malagasy, comes from the thermal springs located in and near the town of Ranomafana. The Ranomafana region contains many rare and unique species of flora and fauna. It is one of the most species-rich areas for primate diversity in the world—twelve species of lemurs coexist there, and two species are known to exist only in this region. Also found in the park are rare carnivore species, over 90 butterfly species, and a wealth of useful and rare plants, including hundreds of orchid species.

Significant threats facing the park and surrounding area are related to human activities in the peripheral zone, including slash and burn "tavy" agriculture, commercial timber exploitation, and uncontrolled ranging of livestock. Ranomafana National Park was created to preserve the biological diversity and ecosystems of the park through a program linking conservation of the core park area with improved standards of living and income alternatives within the surrounding peripheral zone.

Village leaders consult on their village's crayfish industry.



Entrance to  
the Ranomafana  
National Park.

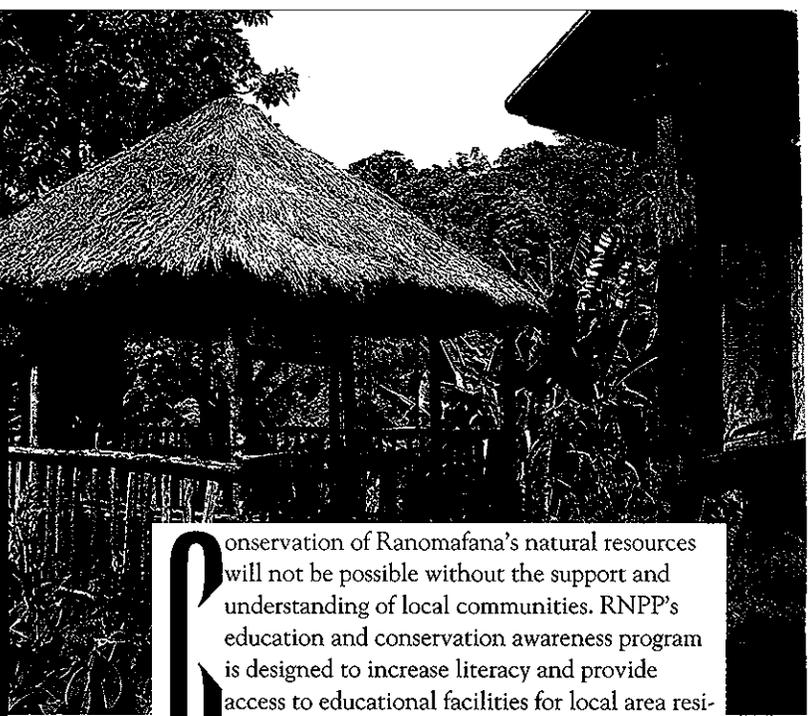
## Biodiversity Training Program

The Biodiversity Training Program is an important component of the RNPP, and international scientists are training Malagasy students in conservation science. When they become professionals, these young people will work in Madagascar in conservation projects, university professorships, research institutions and government positions. Many will become policy makers, and their training and skills will influence resource use decisions at the national and local levels.

The RNPP has developed research and training facilities within Ranomafana National Park, which include a research cabin, a research laboratory, and an extensive trail system marked and mapped for researchers. During the first three years of the Project, RNPP scientists have trained 29 undergraduate university students, and have worked closely with 14 Master's degree and 18 PhD students who have completed their research projects. An additional 30 Malagasy students have begun university graduate degree programs with research projects in conservation science at RNP under the USAID University Linkage Program.

RNPP has sponsored Malagasy students, professors and project staff members to visit scientific and international conferences on biodiversity. A workshop in 1993 on environmental monitoring resulted in collaborations between Malagasy and US researchers, and created new opportunities for scientific training and education for Malagasy students. Professors from the University of Antananarivo and the University of Fianarantsoa have participated actively in rainforest research, and these university educators are now motivating and encouraging their students to enter careers in biodiversity research and conservation. The RNPP has also provided extensive training to 35 local residents who have learned field techniques that include radio tracking, mist netting, live trapping, biodiversity surveying, and collection techniques. These trained "parataxonomists" now assist scientists in their field research and biodiversity surveys.

Local residents gather together at the research cabin in Ranomafana National Park for a discussion and workshop on biodiversity within the forest.



Conservation of Ranomafana's natural resources will not be possible without the support and understanding of local communities. RNPP's education and conservation awareness program is designed to increase literacy and provide access to educational facilities for local area residents; enhance the environmental awareness of residents, students, teachers and administrators; and educate tourists and visitors to RNP about the value of its biodiversity and the importance of conserving its resources.

## Education

The Project's Phase I socio-economic surveys indicate that illiteracy is extremely high in the Ranomafana area and that overall, 70% of children six to nine years old have had no education at all. These surveys also indicated that community literacy rates were correlated significantly with the availability of schools.

The Project has constructed schools in four villages, and the Ministry of Education has provided the teachers. Outreach programs to both children and adults coordinate with the national Environmental Education Initiative, and these programs are incorporating environmental education materials into the established school curriculum. These educational outreach materials are linked to other components of the Project. Environmental education workshops for teachers are another important focus of the Project's education initiative.

The RNPP's Education and Conservation components are collaborating closely to create formalized environmental education and interpretive programming for park visitors and area residents. Facilitated through the Biodiversity Museum staff and RNP researchers, the programs are presenting information on conservation, on-going research and results, and the biodiversity of RNP.



# Health

The local population perceives the Project's health component to be the most important project activity, and indeed, this component is central to the success of the Project. Prevention, sanitation, family planning, child survival, and education programs are all important aspects of the health component activities. Family planning and child survival programs, in particular, are important because future conservation plans are futile without addressing these issues. Therefore the RNPP is directly confronting the connection between population pressures and environmental degradation. In conjunction with the Malagasy Ministry of Health, the Project is working to lower rates of illness and death by improving water and sanitation; decreasing family size by increasing access to family planning services; decreasing infant and child mortality; and, in the long term, decreasing pressures on area resources through decreased population levels. The Project's family planning and maternal child care activities are critical to the overall health team efforts, and to the other Project components as well. The RNPP is working to increase child survival rates through support to traditional mid-wives, training village health volunteers, and initiating family planning workshops in the Park area communities.

The Project's family planning and maternal child care activities are critical to the overall health team efforts.



# The Future

RNP is a component part of a strong Madagascar national park system under ANGAP. As part of this system, the RNPP will be contributing to a national database that will catalogue the natural resources of Madagascar. To ensure that rainforest biodiversity is preserved for the future, and that local villagers can actively participate in biodiversity activities through employment opportunities, the RNPP continues to train local residents as parataxonomists and biodiversity specialists. To enhance educational opportunities and provide a permanent residence for educational and curatorial activities, the Project plans to construct a museum building on Park land donated by the Provincial Government. This building will house the Biodiversity Museum, containing exhibits illustrating the integrated nature of the Ranomafana Project, and the Ethnography Museum, which will preserve the traditions, history and myths of the local people, before they are lost forever. The Project will also catalogue the vast amount of biodiversity and cultural information about the Ranomafana region and its people, so that this vast treasure house of information is readily accessible to all: researchers, conservationists, students, village educators and museum staff.

Conservation of the biodiversity of the Park is key, and the biodiversity monitoring program will assess changes in biodiversity caused by natural occurrences and human activities, including the impacts of the development project. Diverse tools will be used in the monitoring program, including ground truthing techniques, the Global Positioning System (GPS), and establishment of a Geographic Information System (GIS). Results from the monitoring program will be used to determine levels of disturbance that are acceptable, and this information will be used in the design and implementation of the management plan for RNP.

The long term success of conservation and sustainable development activities in and around RNP depend upon the continued support of all the major players: the national and international scientific community, the Government of Madagascar, the Province of Fianarantsoa, the international funding community, and the local communities surrounding the Park. In the future, half of the entrance fee proceeds will continue to be used by the villagers for their own choice of conservation projects. Small enterprises, such as village campsites and the production and marketing of artifacts, will provide cash income from ecotourism. Government support for the Health, Education and Agriculture Programs will also continue, to enhance the standard of living of the local people, and to ensure for them a sustainable future. Although the success of the RNPP is impressive, we must continue to work actively to develop the foundation we have built in training, education, biodiversity conservation, and sustainable development.

# Participating Institutions

## **Association National pour la Gestion des Aires Protégées (ANGAP)**

ANGAP is a Malagasy organization which manages and coordinates the national parks and reserves of Madagascar. ANGAP consults closely with the Department of Water and Forests of the Government of Madagascar. Based in Antananarivo, ANGAP is establishing the national database consisting of GIS information, biodiversity surveys, and peripheral zone monitoring. The Director General of ANGAP is the President of the RNP Project Advisory Committee.

## **State University of New York (SUNY) at Stony Brook**

SUNY at Stony Brook manages and coordinates the Ranomafana National Park Project through the Institute for the Conservation of Tropical Environments (ICTE) offices both on Long Island, New York and in Madagascar. SUNY at Stony Brook is a liberal arts college with a strong focus on the sciences, ecology, and conservation. Stony Brook offers interdisciplinary programs that focus on the urgent problems of tropical conservation and resource management, and research programs that offer a firm foundation for students training in primatology and biological sciences, and for social scientists studying rural people in tropical forest areas. The University has formal partnerships and exchange agreements with 40 universities around the world. Stony Brook enrolls 1200 foreign graduate students and 300 foreign undergraduate students, and sponsors a variety of programs offering opportunities for Stony Brook students to study abroad.

## **Institute for the Conservation of Tropical Environments (ICTE)**

Located at SUNY Stony Brook, ICTE was founded to promote interdisciplinary collaboration between social and natural sciences, to coordinate training programs for graduate students and professionals in tropical countries, and to provide administrative infrastructure for large integrated sustainable development and conservation projects. The first of these programs is the Ranomafana National Park Project. The activities of over 150 scientists, consultants and technical advisors are coordinated and archived at ICTE. This project is a model for combining preservation of rainforest habitat with small-scale development projects. ICTE is also working to establish a program to conserve Madagascar's coral reefs at Tulear. In addition, ICTE is working in conservation programs with other scientists in Tanzania.

## **Cornell University**

Established in Ithaca New York in 1868, Cornell University has both a strong liberal arts program and an excellent agricultural program.

## **Cornell International Institute for Food, Agriculture and Development (CIIFAD)**

CIIFAD is located at Cornell University and was established in 1990 to work on problems of sustainable agricultural and rural development in Asia, Africa and Latin America. CIIFAD undertakes to mobilize, support and apply knowledge and human resources at Cornell University for addressing, in sustainable ways, the problems of poverty, hunger, environmental deterioration, social disabilities, economic constraints and limited management capabilities. Under CIIFAD's auspices, Cornell faculty and students work with institutions and colleagues in developing countries in problem-focused, interdisciplinary efforts. In collaborative programs, CIIFAD knits together a variety of activities, with the goal of affecting the way that people at all levels of society think about and use their resources—natural, human, physical and intellectual—so as to achieve more desirable and sustainable ways of living.

## **Tefy Saina**

Tefy Saina, a Malagasy NGO founded in 1990, trains rural villagers in techniques to increase rice production. Tefy Saina was founded by students and friends of Father Henri de Laulanie, an agriculturalist and engineer who worked for 32 years with rural Malagasy, and who established many training centers for rural young people. Tefy Saina works with rural people in the management of rice fields, the regeneration of hillside tavies (cut-over hillsides), cattle raising, and the raising of consciousness in agricultural production methods.

## **Miezaka**

Miezaka is a Malagasy NGO founded in 1992 in Fianarantsoa. Miezaka trains rural villagers in techniques to start small businesses and produce artisanal products.

## **University Development Linkages Program (UDLP)**

Five universities have joined together in a five-year academic program designed to make environmental and biodiversity issues a part of university curricula: SUNY at Stony Brook, Cornell University, the University of

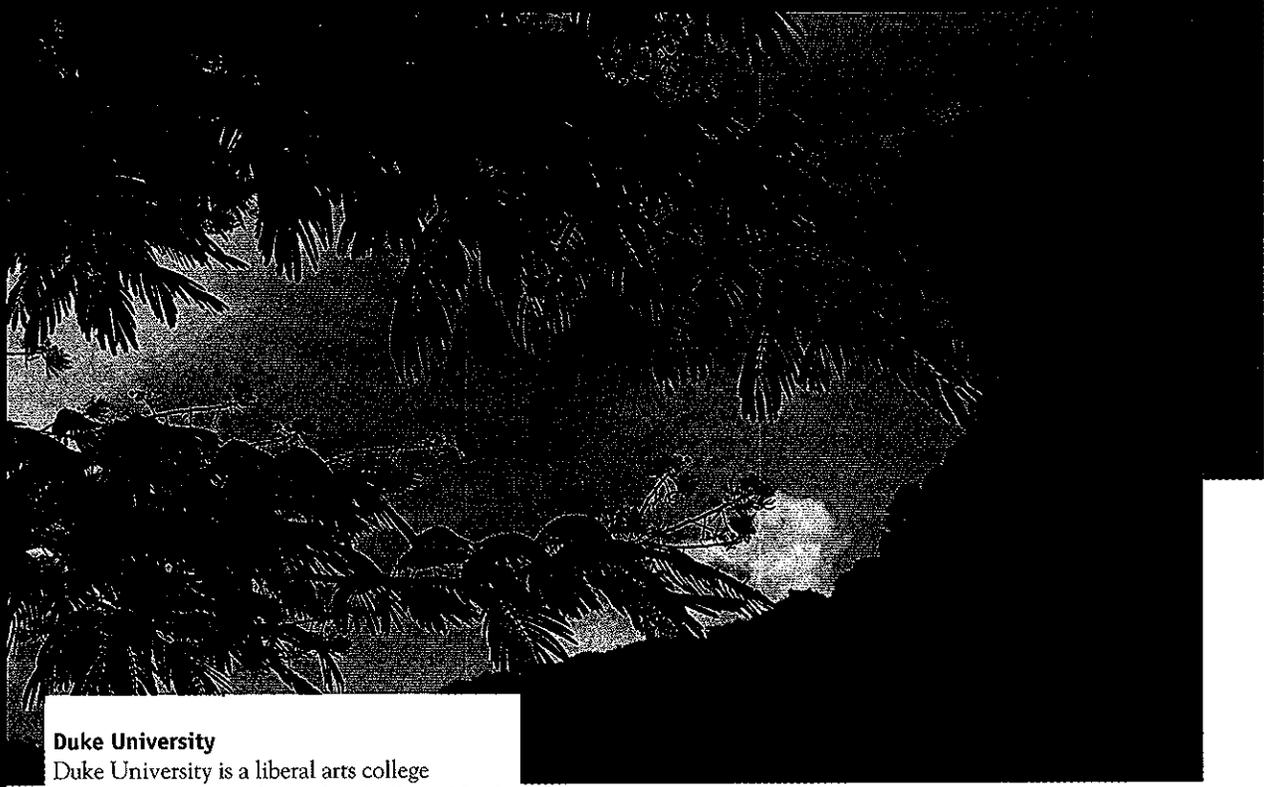


W. E. Steiner

Antananarivo, the University of Fianarantsoa, Eastern Michigan University, and Duke University. Training at the Masters and PhD levels takes place at all the linkage universities, and "hands-on field experience" is provided at the Research Facility within RNP. Malagasy students in the US are studying biodiversity and conservation issues, and international training in the US and at RNP provides reciprocal benefits to students and professors. Malagasies learn about recent technologies and ideas on conservation and environmental issues, and international instructors have the opportunity to work closely with Malagasies in developing solutions to community based conservation problems.

## **Eastern Michigan University**

Founded in 1849 in Ypsilanti, Michigan, Eastern Michigan University has been recognized for its innovations in numerous fields related to education and international programs. One of these programs is an aquatic sciences biodiversity monitoring program located within Ranomafana National Park, which collaborates closely with Malagasy researchers studying ichthyology, limnology, and water resources.



### **Duke University**

Duke University is a liberal arts college founded in 1839 and located in Durham, North Carolina. The Duke University Center for Tropical Conservation (CTC) serves to integrate and coordinate the efforts of students, faculty and institutions at Duke that are focusing on tropical forest management and conservation. In response to the need for broadly educated environmental managers and policy makers in developing countries, CTC has developed the International Professional Training Program. The Duke University Primate Center houses the world's largest collection of endangered primate species, and the Center is collaborating with ICTE on conservation education programs.

### **University of Antananarivo**

The University of Antananarivo is located in Madagascar's capital city. The university's founding dates back to the first year of the medical school in 1896. Between 1954 and 1957 various academic institutes were brought together to form the largest university in Madagascar. Today, professors and students from the Departments of Zoology, Botany, Anthropology and Paleontology are cooperating under the international University Development Linkages Program.

### **University of Fianarantsoa**

Located only two hours from Ranomafana National Park, the University of Fianarantsoa enrolls nearly one thousand students. The Departments of Chemistry, Environmental Law, Computer Science, and Natural Sciences are linking with the other collaborating universities to conduct research on the environment, and to develop a strong curriculum in conservation science.

### **Missouri Botanical Garden**

Missouri Botanical Garden (MBG) in St. Louis, Missouri is one of the largest botanical gardens in the world, and has the largest collection of Malagasy flora outside of Madagascar. MBG collaborates closely with Ranomafana National Park, and helps to identify plants and train parataxonomists. MBG has also established important long term botanical monitoring plots in key areas of Ranomafana National Park.

## **Donors**

### **United States Agency for International Development (USAID)**

**John D. and Catherine T. MacArthur Foundation**

**Liz Claiborne and Art Ortenberg Foundation**

**United States National Science Foundation**

Fulbright Fellowship Program

Man in the Biosphere (US State Department)

Douroucouli Foundation

National Geographic Society

World Wildlife Fund

Wildlife Conservation Society

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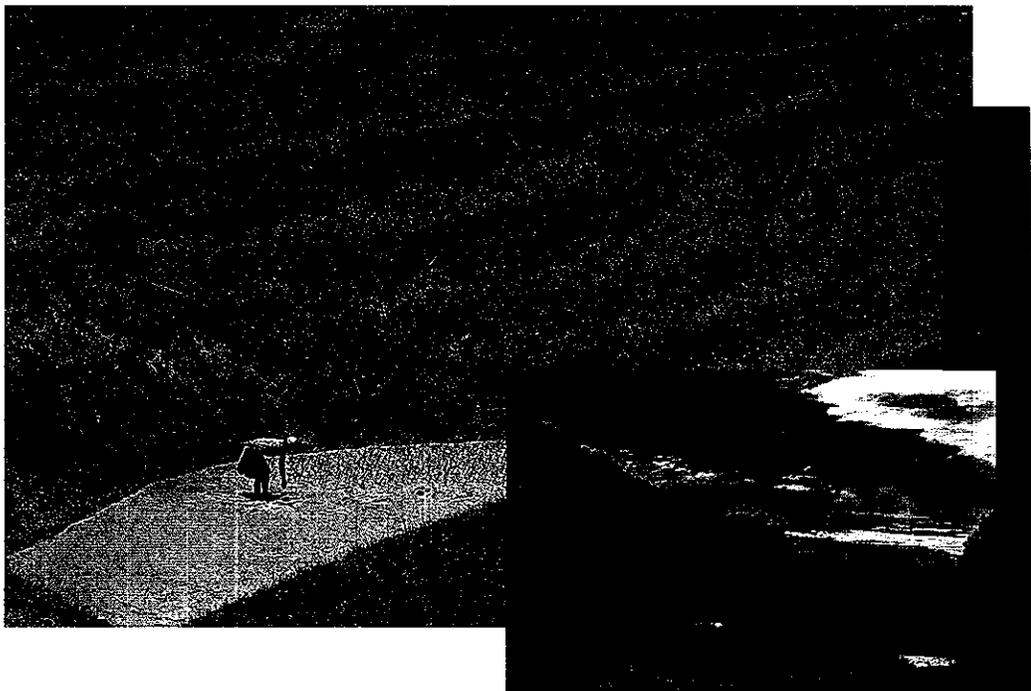
Wildlife Preservation Trust International

Chicago Zoological Society

Rainforest Alliance

UNICEF





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State University of New York (SUNY) at Stony Brook  
Institute for the Conservation of Tropical Environments (ICTE)  
Cornell University  
Cornell International Institute for Food, Agriculture and Development (CIIFAD)  
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Wildlife Preservation Trust International  
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