our planet viewed

Taking a Closer Look at Biodiversity Hotspots

Press kit

mozambique
madagascar

2009-2010
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“We are the 1st generation of scientists to be aware that a third or half of biodiversity will disappear before the end of the century and that 80% of it has still not been recorded.”

Philippe Bouchet, National Museum of Natural History
Over the last 20 years, scientists have become aware of the immensity of biodiversity. Scientists’ perception of the issue is no longer: “1.6 million known species and there may yet be more to discover,” but has rather become: “Today there is no doubt that there are between 8 and 30 million species still to discover, many of which are probably facing extinction”. 16 000 new species are recorded every year; at this rate, it would take between 500 and 1000 years for scientists to complete an inventory.

On the eve of 2010, International Year of Biodiversity, the National Museum of Natural History and Pro-Natura International, working in partnership with the International Union for Conservation of Nature (IUCN), will now place their respective skills and expertise at the service of a large programme of naturalist expeditions called “Our Planet Reviewed”.

An ambitious programme of expeditions, following in the footsteps of Santo 2006

This programme of explorations will benefit from the same investigative methods established during Santo 2006. Three years ago, this expedition effectively allowed no less than 10 000 species to be sampled, several hundred of which were new, and thereby demonstrated that it is possible to carry out ambitious inventories, with the help of suitable human resources and logistics. On the strength of this successful experience, Our Planet Reviewed has chosen to dedicate its research to “neglected” biodiversity. Essentially made up of small and naturally rare species of invertebrate (land and marine), this kind of biodiversity plays a fundamental role in the balance of ecosystems, yet it remains inadequately sampled and studied.

Aims: to discover new species and inspire new conservation policies

Among the regions considered to be the richest in species and among the most threatened on the planet – Hotspots (according to the NGO Conservation International) or Priority Ecoregions (according to the WWF), Madagascar and Mozambique have been identified as major, priority areas for exploration. Indeed, a record number of endemic species of plants and animals is concentrated there, and there is a knowledge deficit in terms of the threat of disappearance. The aim of these expeditions is also to bring neglected areas of biodiversity within the scope of nature protection and conservation bodies.
Mozambique and Madagascar are home to exceptional flora and fauna, which are still relatively unknown and which could imminently become extinct. The conflict which affected Mozambique for almost two decades led to a deficit of knowledge regarding this country. As far as Madagascar is concerned, the attention of international NGOs has essentially been focused on the rain forests and coral reefs, to the detriment of the island’s other regions and ecosystems. These two large countries bordering the Mozambique Channel are therefore a special object of study for the first stage of Our Planet Reviewed.
The coastal forests of North Mozambique form part of a much larger group of ecosystems, known as the “East African Coastal Forests”. This area has been identified by biologists as a major region in terms of biodiversity (one of 34 global Hotspots highlighted by the NGO Conservation International). Stretching across Kenya, Tanzania and Mozambique, these coastal forests appear on the list of 25 global forest sites which are a conservation priority and are considered to be one of the 10 ecosystems in Africa under the greatest threat of disappearance. The cause: deforestation owing to agriculture and exploitation of wood resources.

These coastal forests, which are nothing more than dispersed relics in Kenya and Tanzania, are relatively well-known in these two countries. There is almost no information about Mozambique, where the main part of the forest could still be located.

The East African Coastal Forests include different plant formations which are still poorly understood and difficult to characterise. The aim of the expedition is to obtain information on its composition in terms of the species, ecology, location and extent of these formations, in a region which, until now, has been largely ignored by biologists. The most northerly part of Cabo Delgado Province is considered to form part of a centre of endemism for plants and is only known of through studies carried out in the Lindi region in southern Tanzania. The expedition’s inventories will focus on plants and small fauna (essentially insects), as the large fauna is well known.

The first difficulty which the scientists will face will be locating these forests, which are set in a system of tree-covered savannas (which are ecologically important but much less rich in species). Satellite images do not allow a distinction to be made between these two kinds of large formation and field trips will allow the acquisition of the physical and biological map of one of the last great dry forest massifs on the East African coast.

The expedition will take place in Cabo Delgado Province, which occupies a coastal strip at the extreme North of the country and measures around 250km from South to North (from the capital, Pemba, to the Tanzanian border) and 50km East to West, starting from the coastline. Both the regions of Quiterajo and Palma will be covered by the team in detail. These two areas, which were selected during aerial explorations carried out in 2008, will be part of the priority objectives for this inventory.

The first part of the programme will take place in a 336km² private concession, the Maluane Reserve. The main village, Quiterajo, is located around 5 hours (320km) from Pemba. A camp will be set up near this village. The second part of the expedition will involve the most northerly region of the Province and the main camp will be established near the Rovuma, the river which forms the border with Tanzania. The teams will use this as a base camp to travel around this vast region of forests and tree-covered savannas in 10 expedition vehicles, in order to create the most detailed biological map of the area possible. The majority of this region has never been explored by scientists.

A team of local and international specialists

Under the leadership of Olivier Pascal (Pro-Natura International), 25 scientists (from South Africa, Zimbabwe, Mozambique, Kenya, the United Kingdom and France...) will take part in this land inventory over 5 weeks. Around fifteen people will provide supervision, technical assistance (climbers and hot-air balloon pilots) and logistical support (drivers, cooks and camp staff).
Ambitious technical resources

The scientists will move around an area of approximately 20,000 km² in a mobile camp. Equipment for accessing the forest canopy will be available to them, and this will notably include a new, motorised fire balloon, which will be tested on this occasion.

Co-operation with Mozambique

This land expedition is being organised in partnership with the Mozambique Institute of Agricultural Research (Instituto de Investigação Agrária de Moçambique - IIAM). This body is in charge of the inventory of natural resources outside protected areas and is home to the National Herbarium. The IIAM is already committed to the biological exploration of Mozambique’s medium-altitude forest with Kew Gardens, and the organisers have naturally built up a partnership with these two bodies for the 2009 Mozambique expedition. It is essential that national and regional skills are used in order to ensure that these inventories are firmly established over the long-term, in order to benefit from improved expertise in the study region and also encourage the emergence of local skills. Training Mozambique National Herbarium technicians is part of the inventory programme.

Scientific objectives

The main objective of this project, which is organised in two parts (“Vegetation and Flora” and “Zoology”), is to describe the vestiges of the dry coastal forests of North Mozambique. This does not only involve studying the composition of the fauna (small vertebrates, small mammals, bats, birds, amphibians and insects) and flora (mainly woody species), but also characterising the different types of vegetation encountered and creating a “bill of health” for them for conservation measures which may subsequently take place.

This work will essentially be carried out on the basis of comparisons with the forests in Tanzania and Kenya, which have already formed the object of numerous naturalist inventories.
A remarkable, temperate marine enclave, marked by the presence of seasonal cold currents and a belt of brown seaweeds, Madagascar’s extreme South in many ways offers a coastal landscape which is different to the rest of the Indian Ocean. This region is particularly rich in endemic species and has great scientific value and significant conservation potential. Furthermore, it is particularly underexplored owing to its geographical position, which is difficult to access, and particularly harsh maritime conditions.

Exploration of this area is expected to reveal many new species of flora and fauna and to help to improve the understanding of geographical models of the Indo-Pacific region.

At present, 235,000 marine species have been recorded in the world’s seas and oceans.

Every year, researchers describe around 1,650 new marine species and it is estimated today that the actual number is probably over 1 million – and may even be more than 10 million. Two areas are generally acknowledged as reservoirs of unknown marine species: deep sea beds, which occupy 90% of the surface area of the oceans and coral reefs, which only cover 0.1% of the surface of the planet, but where 5% of the world’s total biodiversity is concentrated.

Since the beginning of the 1990s, shellfish collectors have discovered several dozen new species in the Malagasy Grand Sud region. These have essentially been collected from the low-water mark on the coast or as a by-product of villagers’ lobster fishing activity in shallows of 5 to 30m in depth. By means of a comparison, there have not been any such discoveries on the coast of New Caledonia for over 100 years! These discoveries, which are concentrated on the coasts of the Anosy and Androy regions of Madagascar, therefore bear witness to the originality of the region and the very low levels of scientific exploration. The Malagasies call this part of the country the “Grand Sud” or Atimo Vatae (pronounced Atsimo Vata’) and hence the name of the expedition.

1/ The sea’s accumulation of natural debris (seaweed, dead wood, cuttlefish bones, etc.) or debris which is anthropogenic in origin, abandoned at the upper limit of the rising tide.
A team of local and international specialists

Under the leadership of Philippe Bouchet (National Museum of Natural History), the expedition will bring around fifty local and international participants, together with taxa specialists with skills covering all sectors of marine biodiversity (seaweed, fish, molluscs, crustaceans, corals, etc.). The expedition will be organised around a land base, which will initially be established at Fort Dauphin and then at Lavanono. This will function as a small maritime laboratory with a team carrying out tasks such as sorting, macro photography, tissue sampling and data archiving. The team, which will be made up of around fifteen researchers, technicians, qualified divers and volunteers, will use small boats to take samples within an area of around 20 to 50km (1 to 2 hours from the base).

At the same time as the activities at these land bases, a second team of 10 people will be deployed at sea on the Antéa, an oceanographic research vessel made available by the Institute of Research for Development (IRD).

Scientific Objectives

The main objective of the Atimo Vatae campaign is to explore and describe the marine fauna and flora (fish, seaweed and macrobenthos), using data on macroecology issues and creating knowledge-based conservation tools. The expected results are the discovery of new species, the barcode characterisation of some 2000 species of fauna and flora and the description of large geographical units and populations.

The Antea is a 34m research catamaran belonging to the IRD. It is usually deployed in the tropical Atlantic and 2010 is the first time that it will carry out research work in the Indian Ocean. It has the capacity for up to 10 scientists.

Important logistical resources

The oceanographic research vessel Antéa, which is being deployed in the South West of the Indian Ocean by the Institute of Research for Development (IRD) during the first half of 2010, will be used to support samples taken by divers for the exploration of the areas furthest from the base at Fort Dauphin. These operations will be divided into 6 modules of 5 to 8 days at different geographical locations (the Sainte Luce, Cap Andavaka, Banc de l’Etoile and Baie des Galions areas).

An exemplary local partnership

This project displays a great willingness to involve local actors and decision-makers. Therefore, Atimo Vatae has set training and plotting objectives:

- The participation of Malagasy researchers and students, both in the field and after the expedition (using the results).
- The publication of a reference work on “The Seascapes and Marine Fauna and Flora of Madagascar’s Deep South” in the 3 years following the expedition (and without waiting for the successful identification of all the organisms).

The University of Tulear Institute of Fisheries Research and Marine Science (IH.SM) is the incontrovertible university partner for everything concerning oceanography and marine biology in Madagascar. Within the framework of the Atimo Vatae project, the Museum will also be working as a team with the Malagasy office of the Wildlife Conservation Society (WCS), which is one of the main local non-governmental actors in terms of managing natural heritage and which has a particularly active “marine” programme. The role of the IH.SM and the WCS in this project is, on one hand, to ensure better plotting of results with regard to the Malagasy authorities and, on the other hand, to ensure that post-expedition monitoring of the conservation environment takes place.

1/ Marine organisms which live near the bed of the seas and oceans and which are larger than 4 millimetres.
April and June- July 2009
Explorations of the Mozambique Channel shrimp beds

**April 2009: expedition on board the Vizconde de Eza**

An exploratory campaign was carried out in the shrimp beds of South Mozambique, from the South African border to the Zambezi estuary, on board the Vizconde d’Eza, a research vessel belonging to the Spanish Institute of Oceanography (Instituto Español de Oceanografía). Over 9 days at sea, 18 (Spanish, Mozambican, American, Taiwanese and French) participants were able to carry out 45 dredging and trawling operations at depths of between 100 and 1800m.

**June–July 2009: exploration on board the Miriky**

Starting from Nosy Bé, a 20-day expedition sampled beds at depths between 100 and 1000m located between Cap d’Ambre – to the extreme north of Madagascar – and Cap St. André – to the west of Majunga. The expedition took place on board the Miriky, a 24m shrimp trawler belonging to the Nossi-Be Fisheries Company (UNIMA group) which had been modified to suit scientists’ requirements. In total, 12 participants, including a professional fisherman, carried out 110 operations at depths ranging from 100 to 1000m.

Many species, which were unknown to the participants, were sampled during these 2 expeditions. It may therefore be assumed that there have been wonderful discoveries, which have to be confirmed by laboratory studies. In Madagascar, communities associated with cold seepage (or cold springs) have been discovered in the Betsiboka (a river in North Madagascar) sedimentary cone at depths of around 800m: a first for the Indian Ocean! Finally, participants who were privileged enough to have been in the field in Mozambique and Madagascar were surprised by the great differences in the composition of the fauna on the two sides of the Mozambique Channel.
Co-operation and scientific networks

Use of the results of the expeditions is simultaneously part of an individual framework and an institutional and programmatic framework.

On the individual level, scientists involved in expedition field work co-operate with numerous taxonomy specialists from various groups, including professionals from other institutions or high-level amateurs, who also participate widely in the study of collected material. A vast, informal network therefore allows the samples to be distributed to the, sometimes the only, worldwide specialist in the group.

On the institutional level, large biodiversity description projects have been established over the last few years. Our institutions are taking part in these and are therefore making an important contribution to this international effort.

European Distributed Institute of Taxonomy (EDIT)

Created in 2006, EDIT (the European Distributed Institute of Taxonomy) is an international consortium of large natural history museums and botanic gardens, coordinated by the National Museum of Natural History. Its objective is to integrate research into taxonomy. This network of excellence is supported by the European Community within the framework of the 6th FPRD (Framework Programme for Research and Development).
The Barcode of Life (BOL)

The Barcode of Life was born in 2003, under the impetus of the Canadian Paul Hebert. The idea is to use a DNA sequence which, following the examples of commercial barcodes, means that each species can be characterised using the sequence from a DNA fragment. Eventually, the DNA barcode should, therefore, mean that not only can new species be discovered and described, but also that attempts can be made to attribute an unidentified species to a known species. In order for this application to be possible, it is necessary to develop databases which allow the names of species to be linked to DNA sequences, through specimens which have been identified by specialists and listed in collections. Therefore, scientists from all around the world use this to create an important database of the sequences of known species, and can also use the sequencing as a tool for the analysis and exploration of unknown species. An international consortium, The Consortium for the Barcode of Life (CBOL), which brings 170 organisations (including the National Museum of Natural History) together, was created in 2004 in order to develop these databases.

The Marine Barcoding of Life (MarBOL): Census of Marine Life x Consortium for the Barcoding of Life

At the crossroads of the Census of Marine Life and the Barcoding of Life, the MarBOL programme, which is supported by the Sloan Foundation, aims to accelerate the production and online publication of DNA sequences based on marine specimens submitted to public collections. The MarBOL project brings 5 large collections of "barcodable" marine invertebrates together, including the National Museum of Natural History’s collections of molluscs and crustaceans, which have been specially created for sequencing since 2004. The objective of the iBOL (International Barcoding of Life) programme, which is currently being launched, is to sequence 100,000 marine species over the course of the next 5 years.

The Malagasy expeditions are fully integrated into these two large international networks: there are many participating institutions and researchers who are involved with one or other of the working groups in various capacities. The scientists aim to generate DNA sequences for around 2000 marine species at the end of these expeditions.

In the same way, all molecular collections resulting from collections made in Mozambique will be processed in order to feed the global database within the framework of the Consortium for the Barcode of Life (CBOL). Two laboratories are heavily involved in "barcoding" zoological samples: the Museum’s Molecular Systematics Department and the Biology and Population Management Centre at Montpellier. These two laboratories are collaborating with the National Sequencing Centre, "Génoscope," at Evry, a large French sequencing organisation.

The Census of Marine Life

The Census of Marine Life was launched in the United States in 2000 for a duration of 10 years. It is a vast international programme which brings researchers from 53 countries together. Its aim is to improve knowledge of the sea’s living resources, particularly in the richest and/or less well-known environments. It coordinates the biological exploration of the oceans, in such a way that an assessment of the state of the ocean biosphere can be made and its development can be monitored. It is currently used to describe 1630 new animal and plant marine species around the world every year. The main source of discoveries is the Indo-West Pacific biogeographical region, with 39% of new marine species described every year, because, while it is the biggest, it is also the richest in species. Most of the discoveries involve crustaceans, molluscs and fish.
The main objective of naturalist expeditions, such as the one organized in Mozambique, is to add to existing knowledge of biological diversity and to discover new species of organisms. Very little is known about a number of land groups and our current knowledge about the species of some zoological groups is less than 10% of their estimated global diversity.

For each sample, the data relating to the collection is recorded and stored in a database. In this way, the location, the geographical coordinates, the date, the collector and the collection conditions are systematically attached to the sample. For some groups, photographs of live animals are taken, meaning that future work can be illustrated.

There is great variety in terms of collection methods, according to the diversity of zoological land groups (various kinds of trapping, pheromonal or light attraction, interception methods and collection on sight). These methods involve different ways of preparing the collected organisms, which may be conserved alive or drowned in alcohol.

Therefore, samples of invertebrates or vertebrates will be processed differently. With regard to small vertebrates (rodents, amphibians, reptiles, birds...), the animals are autopsied and prepared for addition to the collection. They are generally preserved in formaldehyde until the final preparation of the sample for subsequent study. At the same time, tissue samples are taken for molecular analysis or DNA. The samples are then sent to specialists in the group for taxonomic study.

In the case of arthropods (spiders, scorpions...) the processing chain is slightly different. Organisms collected with generic traps are roughly sorted (for example, Malaise traps: an interception tent which is not very selective). This initial sorting means that we must call on wide-spectrum zoologists (there are over 400 families of insect). The specimens are then passed on to these specialists.

While the specialist is making a definitive study of the material, they also sort the different species and return the sorted material to the Museum in alcohol for molecular study.

In the case of large samples (large beetles, Lepidoptera, Odonata...) duplicate samples, or a part of them (legs...) are placed in alcohol before they are passed on to a specialist for taxonomic characterisation, or even description. Once these samples have been named by taxonomic experts, they will then have one or two genes sequenced, in order to create a genetic barcode which will facilitate subsequent identification or rebuild the evolutionary history for some of the groups studied. The rest of the samples are then put into dry storage. In the case of small samples, it is now possible not to destroy the sample and to ensure that high-quality DNA is extracted and the sample is preserved for subsequent morphological study and inclusion in the collection. These non-destructive methods are systematically used for small samples collected in small amounts (1 or 2 examples).

During the 2009 Mozambique expedition, genetic samples for subsequent analysis will be systematically prepared, at least for large “invertebrates”. Sorting will be carried out in the field by expedition researchers, and then at the National Museum of Natural History in Paris or at the INRA (National Institute for Agricultural Research) in Montpellier. Once they have been sorted, the samples will be sent to a large panel of taxonomists, who will carry out morphological characterisation and identification.

The collections made will be duplicated in all cases and one of the duplicates will be returned to Mozambique. An agreement has been established to this effect. Some collections may be kept in partner laboratories of the European network of excellence EDIT.
Freshly collected samples will be sorted at the marine laboratory based on land at Fort Dauphin, at Lavanono or on board the Antéa. Bulk samples are initially sieved through sea water and large items are sorted with the naked eye, while small ones are sorted using a binocular loupe. Animals and sea weed are separated into species and photographed fresh (living colours). Tissue samples are taken for subsequent sequencing (Marine Barcoding of Life). Sea weeds are prepared in a herbarium and animals are preserved in alcohol. All the samples are duly referenced in order to ensure monitoring is carried out between the different collection sites, photographs of specimens, tissue samples and collection samples. Once sorted on site and packaged, the samples are stored in cans which will be taken back to the Museum by maritime freight.

At the Museum, the samples are more finely sorted in order to allow the international network of taxonomists to mobilise. A reference collection (identified material) for some taxa (fish, corals and the most important species) will also be left in Madagascar at the University of Tulear Institute of Fisheries Research and Marine Science (IH.SM).

Collections may also be split between the institutions of some of the expedition’s participants who have specialisations or a network which is complementary to the Museum’s work. Therefore, within the framework of the European network of excellence EDIT, the collection of sponges will be mainly destined for the Netherlands National Museum, which has a researcher participating in the expedition, who will provide the taxonomic expertise for this group. Similarly, fish will be shared between the Museum and the South African Institute of Aquatic Biodiversity, which has 2 researchers participating in the expedition and providing the essential taxonomic expertise for samples from this group.

Finally, in the case of molecular collections, and within the framework of the Consortium for the Barcode of Life (CBOL), a double of the mollusc DNA collection will be sent to the Smithsonian Institute (Washington DC), whose researchers will be responsible for “tissue sampling” during the expedition. As in the case of material collected during the land expedition to Mozambique, the Barcode characterisation of the marine material collected also relies on internal co-operation with the Museum’s Molecular Systematics Department and external co-operation with Génoscope at Evry.
An international, multi-disciplinary team in the field

With the support of researchers, technicians and volunteers, the National Museum of Natural History’s Philippe Bouchet lead the marine expeditions to Madagascar. The land expedition to North Mozambique at the end of 2009 is led by Olivier Pascal, from Pro-Natura International. Philippe Bouchet and Olivier Pascal have already worked together during the Santo 2006 expedition.

Philippe Bouchet, Operations Manager “Large Naturalist Expeditions”
Philippe Bouchet is a professor at the National Museum of Natural History specialising in systematics, natural history and mollusc conservation. The exploration and inventory of unknown fauna has led him to participate in or organise large expeditions in three oceans, as well as on isolated islands, particularly in the west Pacific. His latest research tackles the specific wealth of complex coastal environments through questions affecting all aspects of biodiversity, such as rarity, spatial heterogeneity and endemism. He is the author of important monographs, has described over 500 new species of mollusc and actively participates in various European and international programmes developing taxonomic references. He is also a member of the International Commission on Zoological Nomenclature.

Olivier Pascal, programme director for the NGO Pro-Natura International
Olivier Pascal trained as a botanist and is now programme director for the NGO Pro-Natura International. He has been organising the Radeau des Cimes expeditions (Cameroon, Gabon, Madagascar, Panama and Vanuatu) for 18 years. The Radeau des Cimes is an inflatable raft which allows the canopies of tropical forests to be studied and biological inventories to be made. Navigating between the professions of “sustainable development”, which he exercises in the least-favoured regions of Africa and “conservation“, he advocates innovative and modern approaches to strengthen the interest and attractiveness of studying and preserving Biodiversity.
From November 2009, when the expedition sets off for Mozambique, the public will have access to field notes on the project blog, be able to share their comments online, ask questions in the forum, follow the interactive collection itinerary or even observe the first specimens collected!

The expedition’s fans can also subscribe to the website’s newsletter or join the “Our Planet Reviewed” Facebook group!

This website is the result of cooperation between the Communication Directorate’s Multimedia Centre, the Museum’s reception and partnerships, the Expedition’s Scientific Management, the Museum’s Teaching Directorate and the Surletoit group.

Within the framework of its dissemination of knowledge objective, the National Museum of Natural History has established a website dedicated to this series of expeditions: www.laplaneterevisitee.org.

Designed for the general public and for teachers, this bilingual website (French-English) is regulated by the expedition calendars.

From 27th October 2009, the public will be able to access all the details about the “Our Planet Reviewed” initiative and its expeditions to Mozambique and Madagascar:

- An overview of the programme objectives (the development of knowledge on neglected areas of biodiversity) and its special features (a new expedition model, international co-operation, concentrated resources and combined expertise),
- Animated, interactive maps of the destinations (biodiversity “hotspots”) and the calendar of the different stages,
- Video interviews with the organisers and pictures of the participants,
- The methods used,
- Targeted files on each theme,
- Educational resources in the “teachers” area.

www.laplaneterevisitee.org
www.ourplanetreviewed.org
Since 2005, the National Museum of Natural History has been developing an educational programme to accompany scientific expeditions exploring biological diversity. Within the framework of the International Year of Biodiversity and the Mozambique-Madagascar expedition, the Museum’s teaching directorate has set up a new educational project based on the expedition for the 2009-2010 academic year. This gives teachers with an interest in this subject an opportunity to develop projects with their pupils, from a range of educational, multi-disciplinary resources based on the expedition’s scientific content. All these resources can be accessed for free by teachers on the expedition website from the start of the school year in 2009. Designed for French-speaking teachers all around the world (French academies, the Indian Ocean...), these resources aim to allow teachers to create activities for their pupils on their own. There are several kinds of resources available: programmes interlinked with the primary and secondary school curricula, suggestions for multi-disciplinary educational activities, visual materials (photos, videos...) field notes from the best parts of the expedition and background articles; these have been developed at the Museum by a team of teachers and trainers from the Teaching Directorate.

A forum has been established for discussions and two educational correspondents, trained teachers, will answer questions from teachers developing a project in class. Classes involved in this project will be invited to enter a competition. The Museum will launch an appeal for entries on the expedition website at the end of 2009 and teachers who wish to participate will be able to submit educational projects about the Mozambique-Madagascar expedition. The best class work will be chosen by a jury and prizes will be allocated to the winners at the end of the school year. The winners will also have their work exhibited at the Jardin des Plantes botanic gardens from June 2010, as part of the “Biodiversity Inventories” exhibition.
The National Museum of Natural History

The National Museum of Natural History has been an exceptional scientific establishment for over 300 years and is a worldwide specialist in biodiversity and naturalist and environmental issues.

Created in 1635, originally as the Royal Garden, and responsible for major scientific discoveries in the field of Natural Sciences, today the Museum is a public cultural, scientific and professional institution, under the joint authority of the Ministry of Higher Education and Research and the Ministry of Ecology, Energy, Sustainable Development and Spatial Planning.

At the crossroads between Earth, Life and Human sciences, the Museum exercises its vocation through five fundamental objectives: fundamental and applied research, the conservation and enrichment of collections from natural and cultural heritage, teaching, expertise and the dissemination of knowledge.

Strengthened by its history, the Museum has become a benchmark centre for the study and preservation of biodiversity. A prestigious research establishment, it relies as much on field studies as on laboratories, as well as great interdisciplinarity, exceptional collections – one of the three greatest in the world – and unique expertise. It can therefore, through various dissemination activities and its teaching activity, inform and raise awareness in many public areas about protecting our planet.

A few key figures:
- 1880 people, including 500 researchers
- 68 million specimens in the natural history collections
- 350 students (masters and doctoral school)
- 13 sites in Paris and the regions
- 2 million visitors a year

www.mnhn.fr

Pro-Natura International

With reference to the United Nations agreements on Biodiversity, climate change and desertification, PNI seeks to respond to socio-economic and environmental problems in rural communities in southern hemisphere countries. On the basis of almost 20 years of experience in the field, PNI offers innovative, adapted solutions which reduce poverty and respect the other objectives of sustainable development while caring for the protection and restoration of the environment. In order to break the “poverty/environmental degradation” vicious circle, PNI offers economic solutions which allow populations to improve their quality of life, whilst still preserving and restoring their natural resources. This is particularly achieved by (re) establishing a participatory system of governance.

PNI’s main activities in southern hemisphere countries:
- The design and realisation of participatory development programmes;
- Training participatory development project leaders and government leaders at local, regional and national level;
- Promoting sustainable agriculture, agroforestry and sustainable forest management;
- Creating and developing small and medium-sized companies;
- Creating cross-border conservation areas;
- Environmental and societal impact studies linked to industrial projects;
- Exploring tropical forest canopies and conserving Biodiversity;
- Carrying out biomass energy projects: green carbon technology.

www.pronatura.org
IUCN, International Union for Conservation of Nature, helps the world find pragmatic solutions to our most pressing environment and development challenges. Created in 1948, IUCN has more than 1000 member organizations. IUCN works on biodiversity, climate change, energy, human livelihoods and greening the world economy by supporting scientific research, managing field projects all over the world, and bringing governments, NGOs, the UN and companies together to develop policy, laws and best practice.

Through The IUCN Red List of Threatened Species™, one of IUCN’s main objectives is to gather data to better understand the threats to biodiversity in order to develop conservation actions to stop the current extinction crisis.

The future welfare of mankind also depends on the preservation of species. However, biodiversity is still largely unknown and thus it is essential to continue the effort to gather data. IUCN has decided to join the National Museum of Natural History in Paris and Pro-Natura International, to carry out the initiative called The Planet Reviewed.

IUCN sees this project as a way not only to strengthen the institutional links with two of its members but also to enhance conservation efforts through the use of the best scientific knowledge.

IUCN will contribute to this project in several ways:

✦ Mobilize IUCN partners, members and its 10,000 experts at the local and regional level,
✦ Bring together research and conservation,
✦ Assist in developing targeted conservation strategies through use of the information obtained during the expeditions,
✦ Contribute to the implementation of awareness-raising programmes in the host countries,
✦ Support the communication strategy by giving visibility to the project and its results through links with international media and / or organization of press trips,
✦ Support fundraising efforts for the research.

www.iucn.org
Major sponsors

The Prince Albert II of Monaco Foundation

Created in 2006 by Prince Albert II of Monaco, the Prince Albert II of Monaco Foundation encourages sustainable and balanced management of natural resources and places mankind at the centre of its projects. It supports the implementation of innovative and ethical solutions in three main areas: climate change, biodiversity and water.

The Foundation aims to act as a catalyst for environmental projects and solutions. In order to become an important actor in environmental protection at an international level, the Foundation hopes to create networks of scientists, companies and citizens who are prepared to work together towards the same objective.

The Prince Albert II of Monaco Foundation supports and promotes initiatives by public or private organisations and businesses within the field of studies and research, technological innovation and citizens’ practices. It is committed to raising awareness among populations and States, through the development of its communication activities, which have a strong capacity for mobilisation. In order to stimulate and promote innovation, the Foundation relies on scientific and technical monitoring work on an international level.

The Foundation is behind participants and projects, and is ready to listen to environmental problems, issues and solutions. It encourages the creation of debate sites for environmental actors, mobilises financial support and is committed to the establishment of responsible social investment tools.

Total Foundation

Created in 1992 in the wake of the Rio Summit, the Total company’s Foundation’s projects have been dedicated to protecting the environment and, more specifically, to marine biodiversity, for fifteen years. Three intervention approaches are prioritised: research, rehabilitating threatened ecosystems and raising awareness. All of these activities are carried out thanks to partnerships formed with research institutes, NGOs or institutional actors who are recognised in their field of expertise.

Over 160 programmes have been supported in 40 countries, in extremely varied coastal and marine ecosystems.

Since 2008, the Foundation has extended the scope of its activity to two other areas of patronage: Culture – Heritage (The Louvre, the Arab World Institute and the Quai Branly Museum) and Health – Solidarity - Education (Preventative health, road safety and education in priority areas...).

Not only does the Foundation work with the Museum, but also with the Port-Cros National Park, the Conservatoire du Littoral (the French coastal conservation body), Ifremer (French Research Institute for the Exploitation of the Sea), the IUCN (International Union for Conservation of Nature), the Sloan Foundation and many others. These all share recognised competence in carrying out studies and research in the field of biodiversity.

The Museum and the Total Foundation have had an established partnership for over fifteen years in geosciences (Year of the Earth partnership) and mineralogy (acquiring minerals and launching a virtual gallery), two areas which are linked to Total’s professional activity, as well as environmental science. Before the naturalist expedition to Madagascar and Mozambique, the Foundation supported the marine sections of the Lifou (Polynesia), Panglao (Indonesia) and Santo (Vanuatu) expeditions. It also finances research programmes within the fields of the taxonomy and genetics of marine species.

www.fondation.total.com
The ARS-Cuttoli-Paul Appell Foundation was created in 1978 under the aegis of the Fondation de France and is providing financing amounting to €60,000 for the inventory of zoological biodiversity during the expeditions to Mozambique. With a firm commitment to supporting Life Sciences, the Foundation has helped to facilitate several ambitious and innovative scientific research projects. The Fondation de France supervises over 650 funds and foundations created under its aegis (which is around 40% of the foundations in France) and, in 2008, distributed 83 million euros in the form of 6800 grants, prizes and scholarships. The Foundation is independent and private, does not receive any public funding and is only able to act thanks to donors’ generosity.

www.fondationdefrance.org

The Richard Lounsbery Foundation aims to enhance national strengths in science and technology through support of programs in the following areas: science and technology components of key US policy issues; elementary and secondary science and math education; historical studies and contemporary assessments of key trends in the physical and biomedical sciences; and start-up assistance for establishing the infrastructure of research projects. Among international initiatives, the Foundation has a long-standing priority in Franco-American scientific cooperation. The Foundation generally provides seed money or partial support, rarely renews grants for continuing activities, does not normally fund endowments or laboratory research, and aims to achieve high impact by funding novel projects and forward-looking leaders.

www.rlounsbery.org

Joint venture of Solvay and BASF, SolVin is the second biggest European producer of PVC resin, with a capacity of 1.32 million of tons and 8 production sites. SolVin produces different types of PVC for various uses, taking part of everyone’s daily life. The combined competences of the two companies and the geographical distribution of the production sites enable SolVin to maintain a safe delivery of products and services. For many years now, SolVin also cares about environmental issues, and is for example engaged in the European programme Vinyl 2010®.

www.solvinpvc.com

The Stavros Niarchos Foundation is an international philanthropic organisation which supports activities in four main areas: art and culture, education, health and social action. The Foundation helps non-profit organisations around the world. The Foundation also has an important commitment to supporting programmes in Greece.

The Foundation aims to make contributions with strong added value. At the heart of each category of programme, the Foundation supports initiatives with solid leadership and healthy management, which can also demonstrate a tangible impact over time. The Foundation hopes to encourage discussion and co-operation between recipient institutions, by supporting a wide range of organisations through its targeted programmes in different areas of the world. The donations given by the Foundation finance construction projects, varied programmes and operational support.

Biodiversity is an important subject in the 21st century and, having financially participated in the Santo 2006 scientific expedition, the Stavros Niarchos Foundation’s governing board approved a donation for the initiative entitled "Our Planet Reviewed", where marine and land expeditions will focus on the most threatened areas of biodiversity in Madagascar and Mozambique.

www.snf.org

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www.snf.org
Partners for the Mozambique and Madagascar expeditions in 2009-2010

Scientific and institutional partners

**Mozambique**

The Agricultural Research Institute of Mozambique (IIAM) created in 2004 is under the auspices of The Ministry of Agriculture with the mission to conduct research to “develop and disseminate technologies that will improve agrarian production and productivity, promoting the well-being of Mozambican population while maintaining sustainable use of natural resources”. These include biodiversity conservation and protection of the environment. In this regard, IIAM houses the National Herbarium, and has the mandate to identify, survey and advice on areas and species of conservation interest. To contribute to the development of strategies and recommendations for Biodiversity conservation, protection of the environment and sustainable use of natural resources based on scientific findings, IIAM implement its programmes through partnerships with other stakeholders in the generation or adaptation of technologies, seeking to use accurate methodological systems compatible with International standards.

www.iiam.gov.mz

**Madagascar**

CBGP - Biology and Population Management Centre (UMR [Mixed Research Unit] - Montpellier)

CBGP develops research in systematics, genetics and ecology for objectives relating to population management and communities of organisms which are of interest in terms of agriculture, human health and biodiversity. The centre’s research aims to develop conceptual and theoretical elements and the tools required to manage these organisms. Various biological models are studied: arthropods, nematodes and rodents. The CBGP possesses expertise in systematics and maintains collections and databases on entomology, acarology, nematology and mammalogy.

www.montpellier.inra.fr/CBGP

The Spanish Institute of Oceanography (IEO) is a Public Research Institution integrated into the Ministry of Science and Innovation MICINN (through the Secretary of State of Research), and has ultimate responsibility for the management and funding of marine research, promoting co-operation in marine research at the regional, national and international levels, training marine scientists and disseminating marine sciences knowledge. The IEO aim is to be a source of high quality science used to conserve and enhance the marine environment and to promote sustainable management of its natural resources.

www.ieo.es

The Royal Botanic Gardens, Kew

The Royal Botanic Gardens, Kew is a world famous scientific organisation, internationally respected for its outstanding living collection of plants and world-class Herbarium as well as its scientific expertise in plant diversity, conservation and sustainable development in the UK and around the world. Kew Gardens is a major international visitor attraction. Its landscaped 132 hectares and RBG Kew’s country estate, Wakehurst Place, attract nearly 2 million visitors every year. Kew was made a UNESCO World Heritage Site in July 2003 and celebrates its 250th anniversary in 2009. Wakehurst Place is home to Kew’s Millennium Seed Bank, the largest wild plant seed bank in the world. By 2010, RBG Kew and its partners will have collected and conserved seed from 10 per cent of the world’s wild flowering plant species (c.30,000 species). The aim is to conserve 25% by 2020 and funds are being actively sought in order to continue this vital work.

www.kew.org
www.kew.org/msbp

www.montpellier.inra.fr/CBGP
The Wildlife Conservation Society (WCS), Madagascar

*Wildlife Conservation Society (WCS), Madagascar*

The Wildlife Conservation Society is a non-governmental organisation, with a headquarters agreement from 6th June 1997, under the authority of the Ministry responsible for the Environment and Forests. Its parent organisation was created in 1895 as the New York Zoological Society. The Madagascar office is represented by Lisa Gaylord, Country Program Director. WCS’s guiding philosophy is the promotion of a world where mankind guarantees the intrinsic values of biodiversity and the functions of resulting ecosystems, whilst also profiting from the goods and services offered by the integrity of the natural environment.

www.wcs.org

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Institute of Research for Development (IRD)

*Institut de recherche pour le développement*

Created in 1944, the Institute of Research for Development is a French public establishment which is scientific and technical in nature and which has almost 2200 officers. With a presence in Africa, Latin America, Asia and the French tropical overseas territories, the IRD carries out research, training and expertise activities, the aim of which is to contribute to the economic, social and cultural development of countries in the Southern hemisphere. The IRD’s researchers work in close collaboration with its partners and mainly study ecosystems and the environment, sustainable management of living resources and the development of companies and health.

Within the framework of the Mozambique-Madagascar expedition, the IRD is assisting the MNHN's scientific teams by placing one of its two seagoing oceanographic research vessels at their disposal. The ANTEA is a catamaran which sails around the tropical Atlantic and certain areas of the Indian Ocean; it is a multi-purpose vessel which acts as a support to research on ocean-climate relationships, production mechanisms and ocean dynamics, the monitoring or development of fisheries or marine geoscience.

www.ird.fr
www.brest.ird.fr/us191/flotte/flotte.htm

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UNIMA

*UNIMA*

Created in 1972, the UNIMA group is a shrimping pioneer in Madagascar. With a workforce of 3500, Unima is the island’s leading exporter. The group owns a wild shrimp fishing company (Nossi-Be fisheries) and an aquaculture company (AQUALMA). The Group is highly aware of the social and environmental issues at stake and is heavily involved in sustainable development, particularly through a new partnership with the WWF. UNIMA farmed shrimp bears the Red Label as a sign of quality. This is a global first in the shrimp world. Eco-certification procedures are underway for fishing and aquaculture. Today, UNIMA is pursuing its involvement with the environment by placing one of its shrimping boats, the Miriki, at the disposal of “Our Planet Reviewed” scientists.

www.unima.com
www.nossibe.fr

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Technical partners

*Technical partners*

**Madagascar**

Institute of Research for Development (IRD)

*Institut de recherche pour le développement*

L'Institut Halieutique et des Sciences Marines de l'Université de Tuléar

*L’Institut Halieutique et des Sciences Marines de l’Université de Tuléar*

L'IH.SM has been created in 1992 as a result of the fusion of the Station Marine, the Marine Applied Oceanography branch and the Higher Formation Unit. It has the mission of training and research in matters of fishing and aquaculture, marine environment and littoral. L'IH.SM is responsible for the training of engineers and marine biologists (bachelor, masters and doctorate). In addition, it can ensure the recycling of employees from enterprises according to their needs. The activities of the IHS.M are coordinated by a permanent team and technical assistants from abroad.

www.nodc-madagascar.org
Press contacts

The Desk Agency
+ Tiffany Steigerwald
00 33 (0)1 77 37 29 96
T.steigerwald@thedesk.fr

National Museum
of Natural History
+ Estelle Merceron
00 33 (0)1 40 79 54 40
+ Vanessa Bismuth
00 33 (0)1 40 79 81 36
presse@mnhn.fr

Mozambique and Madagascar expeditions in 2009-2010