



Protected
Endemic
Sanctuaries 

RAYS OF HOPE

PROTECTING THE UNIQUE ENDEMIC HERITAGE OF MAURITIUS



MINISTRY OF AGRO INDUSTRY
AND FOOD SECURITY



NATIONAL
PARKS &
CONSERVATION
SERVICE



FORESTRY
SERVICE
MAURITIUS



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Nature's children by Khaleek Imaan, Mahatma Gandhi Institute Secondary School

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Parks and Conservation
Service (NPCS)

Introduction

Mauritius is home to some of the most unique, rare and threatened animals and plants on the planet. Dedicated individuals and organisations have been working tirelessly to save these precious jewels for several decades. Recently, these efforts have been boosted by a project funded by the Global Environment Facility through the United Nations Development Programme and implemented by the Ministry of Agro-Industry and Food Security through the National Parks and Conservation Service and the Forestry Service. Working with partners in Non-Governmental Organisations (NGOs) and the private sector, this project is expanding Mauritius's protected areas through a series of 'Protected Endemic Sanctuaries' (PES) – homes to plants and animals found nowhere else on Earth. This booklet explains the origin of Mauritius's unique plants and animals, how they became rare, the history of conservation on the island, the birth of PES to protect plants and animals, how you can discover these special places for yourself and so much more.

Enjoy!!

What the dodo taught us

The last record of a living Dodo was in 1662; only 64 short years after this strange and unique flightless bird had been described for the first time. The world beyond Mauritius became fascinated by the dodo and this fascination has grown since its disappearance. Until the dodo's demise people had the perception that all species were created once and survived forever. The disappearance of the dodo taught us that human beings had the power to wipe off an entire species from the face of the earth and the word EXTINCTION was brought to people's attention. But extinction does not have to be inevitable and understanding why the dodo became extinct can help us to save those species that are left. If we act wisely, we can save other species from the dodo's fate.





Origins of Animals and Plants of Mauritius

Species came, adapted and became uniquely Mauritian

Mauritius was formed about 8 million years ago by volcanic eruptions from the deep sea bed which created a mountain, the top of which became the island of Mauritius. Animals and plants reached this lifeless rock from surrounding landmasses by flying, swimming, by “hitchhiking” across the sea on floating vegetation and by being carried by the wind. Isolated from their mainland relatives, the animals and plants began to change as they adapted to their new environment. Many species became so distinct that they are considered to be unique or “endemic” to the island.

Since their arrival, people have deliberately and accidentally introduced many species to Mauritius. Some of these have become pests and are causing serious damage to native species. Since colonisation almost 100 species have become extinct and less than 2% of the native forest is left.

The endemic species of Mauritius are among the most threatened in the world and active conservation is essential to prevent the loss of more species and habitat on this paradise island.

MAURITIAN PLANTS

Mauritius has 691 species of which 273 are Mauritian endemics and another 150 are Mascarene endemics. 61 of the country’s native species are already classified as Extinct, 141 of the flowering Mascarene endemic plant species are classified as Critically Endangered, 55 are Endangered and 98 are classified as Vulnerable.

FOREST BIRDS

Eleven native forest bird species still survive. Positive trends have been registered for endemic species with 2 birds having been downlisted during the last 4 years on the IUCN Red List of Threatened Species from Critically Endangered to Endangered (Mauritius Echo Parakeet (*Psittacula eques*) and the Mauritius Fody (*Foudia rubra*)). (See page 12 for an explanation of the IUCN Red List).

REPTILES

Of the 17 reptile species that used to be found in Mauritius, only 12 remain of which 11 are endemic species. Seven of these species are restricted to offshore islets where they escaped extinction caused by rats. Five of these species are restricted to Round Island.

BATS

Bats are Mauritius’s only native mammals. Only one of the three original fruit bat species remains. It is an important pollinator and seed disperser. There are also two species of small insect-eating bats.

Pristine Mauritius

NATIVE SPECIES - species that reached Mauritius naturally.

MAURITIAN ENDEMIC - native species that have changed so much since arrival that they are now unique to Mauritius.

MASCARENE ENDEMIC - native species only shared with the Mascarene Islands (Rodrigues and Reunion).

INVASIVE ALIENS - species introduced, either directly or indirectly, accidentally or deliberately through people's actions, that have become a threat to native animals and plants.



Painting from Lost land of the Dodo - By Anthony Cheke and Julian P.Hume, published in 2008 by T & AD Poyser, London

Arrival of settlers and the development of Mauritius

Written records of the location of the island of Mauritius were made by Portuguese sailors in the early 1500's. The first people to settle in Mauritius were the Dutch in 1638, following the decision of the Dutch East India Company to colonise the island in order to use it as a refreshing station for passing ships. The Dutch exploited Mauritius's ebony wood, said to be the 'best in the world'.

In 1710, the Dutch officially left the island. The French then took formal possession of the island in 1715 but it was only as from 1721 that the first settlers from Reunion moved to Mauritius. Development activities had been quite slow until 1735, when Governor Mahé De Labourdonnais decided to move the administration from Reunion to Mauritius (then known as Isle de France).

The French period came to an end in 1810 when the British conquered the island. Under British colonial rule, agriculture, mainly the sugar sector expanded massively leading to significant loss of native habitat to provide land for sugar cane cultivation. From 1842, with the arrival of indentured labourers brought to work on the sugar plantations, more forests were converted to satisfy a variety of land uses. This was further exacerbated with the development of the tea sector from 1950s as a measure to create employment and to diversify the economy.

The British colonial era ended in 1968 with our independence and in 1992 Mauritius became a Republic.



...but at a cost

EXTINCT



SADDLED BACK TORTOISE



DODO



MAURITIAN OWL



BLUE PIGEON



GIANT SKINK



MASCARENE PARROT



MAURITIAN GOOSE



RAVEN PARROT



RED RAIL



SMALL MAURITIAN FLYING FOX

Development in Mauritius was done at the expense of its unique animals and plants. This development has resulted in the deliberate and accidental introduction of species from elsewhere, some of which have caused the extinction of native species – most famously the dodo but many more as well; some species such as the ebony were removed in massive numbers while our native tortoises were slaughtered remorselessly for human consumption; and vast areas of forests were cleared to grow sugar cane and to plant pine forests (the latter through a World Bank Funded project) restricting the plants and animals that remained into smaller and smaller pockets of native forest.

The 3 main causes of extinctions in Mauritius

1. Invasive Alien Species

Invasive alien species (IAS) pose the most serious current threat to the native animal and plant species that survive on the Mauritian mainland and on offshore islets. IAS such as Chinese Guava, are species which have been deliberately or accidentally introduced by people into locations outside of which they naturally occur ("introduced species") and whose numbers grow to such extent that they threaten native species or other things that we value such as agriculture and health. At least 21 introduced species of mammals, reptiles and molluscs are invasive in Mauritius. More than 1,675 plant species have been introduced of which 20 have been identified as particularly aggressive invaders.

Impacts of some key alien invasive animals on native animals and plants.

Name of invasive alien animal species	Impact on terrestrial biodiversity
Feral pigs (<i>Sus scrofa</i>)	Disturb soil, disperse seeds of alien plants and have negative impacts on native plant regeneration, ground-nesting endemic species and ground nesting native bird species and ground dwelling invertebrates.
Javanese Macaques (<i>macaca fascicularis</i>)	Damage unripe native fruits, eat the eggs and the chicks of native birds, eat reptiles and invertebrates, and eat the seeds of native plants.
Rusa Deer (<i>Cervus timorensis</i>)	Feed on native plants, saplings and seedlings.
Rats, toads and tenrecs	Serious threat to the survival of native snails.

2. Loss of Habitat

Deforestation for agriculture and settlement began with the colonisation of the island in 1638 although selective logging for ebony (*Diospyros tessellaria*) started in 1598. Most of the native forest cover had been lost by 1935. The last major forest clearance project occurred in the 1970s to replace native upland forest with pine plantations. To date, habitat destruction and fragmentation continue due to gradual conversion of forest to other land uses.

3. Overexploitation

Direct exploitation of certain species has pushed them towards extinction. The Dutch colonised Mauritius for its black ebony which was highly valued. Several other species were also exploited for their wood. Most species of Mauritian palms were exploited for their edible hearts and are all now highly threatened. The four endemic species of giant tortoise (two species each on Mauritius and Rodrigues) are extinct having been exploited for their meat. Direct exploitation of most native species has now largely ceased although certain plant species are still being taken from the wild for handicraft and medicinal purposes.

Impact of invasive alien plants on remaining native forests.

The worst species include Chinese Guava (*Psidium cattleianum*), privet (*Ligustrum robustum*) and liane cerf (*Hiptage benghalensis*). These species and many more, out-compete native plants for space, light and nutrients and quickly come to dominate the forest throughout the island.

Invasive Alien Species



FRAISE SAUVAGE



MADAGASCAR GECKO



PRUNE



ACACIA



WILD PIG



TECOMA STANS



CHINESE GUAVA



JAMBOSA (JEAN BOURGEOIS)



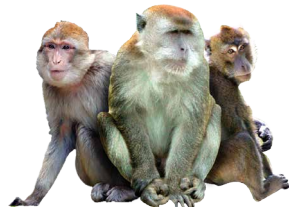
TRAVELLER'S PALM



LIANE CERF



INDIAN MYNA



MACAQUE



INDIAN HOUSE CROW



RAT

First Conservation Initiatives

People realised things needed to change and seized the initiative.

Poivre's "Règlement économique" passed in 1769 and other conservation-related regulations.

The earliest major conservation-related initiatives in Mauritius were pioneered during the French colonial era by Pierre Poivre (1767-1772) who introduced regulations to maintain a forest cover of 30% for water and soil conservation.

The next major breakthrough was the reinforcement of the existing law with provisions to help protect bird populations by Edward Newton who was Colonial Secretary during the British era from 1859.

Following a survey of the island's natural vegetation by Reginald Vaughan and Octave Wiehe in the 1940's, a first restoration plot was established in Macchabee in 1941. Both men were convinced that Mauritian native forest would disappear if invasive alien species were not managed. They advocated weeding of alien plants and fencing against introduced deer and pigs to help restore the forest.

In 1973, following a report of Sir Peter Scott, a restoration programme was set up to save the Mauritius kestrel. There were only four known wild birds left in 1974.

Three years later, another bird restoration programme was initiated by Gerald Durrell together with the Government of Mauritius to increase the population of the Pink Pigeon. This was followed by a similar programme for the Echo Parakeet.



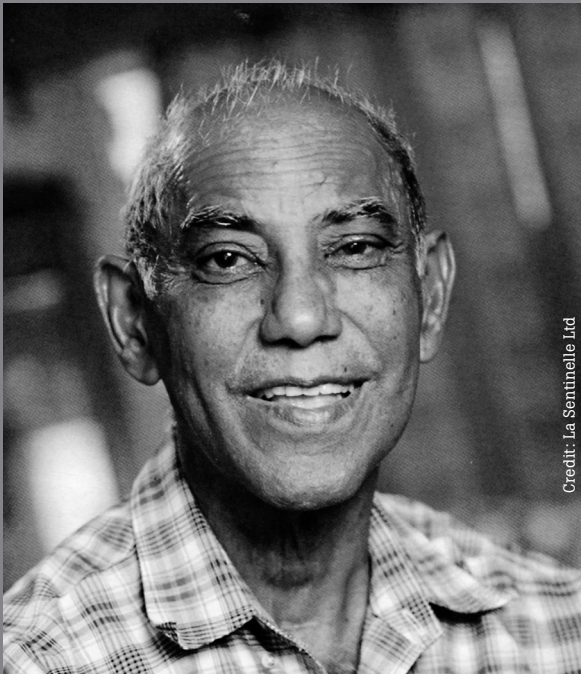
Pierre Poivre

Pierre Poivre was a French horticulturist (23 August 1719 – 6 January 1786), born in Lyon. In 1767, he became the intendant (Chief Administrator) of Isle de France (Mauritius) and Ile Bourbon (La Réunion). The first protected areas were named under Pierre Poivre's administration.



Sir Peter Scott

A famous British Conservationist (14 September 1909 – 29 August 1989), Sir Peter Scott was one of the founders of the World Wild Fund for Nature (WWF) in 1961. He was the first to recommend the declaration of the Black River Gorges as a National Park following a visit in 1973.



Credit: La Sentinelle Ltd

Abdool Wahab Owadally

As former Conservator of Forests from 1969 to 1997, Abdool Wahab Owadally initiated in-situ conservation of the Perrier Nature Reserve in 1971. With the assistance of the Durrell Foundation and the World Wildlife Foundation, he played an active role in setting up native bird restoration programmes to save the Mauritius Kestrel, Mauritius Echo Parakeet and the Pink Pigeon.

Saving the jewels

Conservation and restoration works on Round island under the partnership between the Mauritian Wildlife Foundation, National Parks and Conservation Service and the Forestry Service

Despite the first conservation initiatives many species in Mauritius appeared to be heading towards extinction as the effects of invasive species, habitat loss and overexploitation continued in the 1950's, 1960's and into the 1970's. But, through bold conservation initiatives in the 1970's, miracles started to happen in the form of Mauritius's now world famous endemic bird species recovery programmes which have saved the Mauritius Kestrel, the Pink Pigeon and Echo Parakeet from extinction. The wild population of the Mauritius kestrel was reduced to only four individuals in 1974. Similarly, in 1986, only 12 Pink Pigeons were known in the wild and the Echo Parakeet's population fell to less than 25 individuals in the 1980's. The current population of these threatened birds' ranges from 300 to 500 individuals in the wild. Species recovery work has now expanded to other endangered birds such as the Mauritius Fody and the Olive White Eye, as well as to reptiles and plants. The unique reptile, the Orange-Tailed Skink, has been saved from extinction. Thousands of individuals of rare plant species such as Boucle d'Oreille Mauritius's national flower, endemic Hibiscus species and Mauritian ebony species have been replanted in the wild.

Following Vaughan and Wiehe's initiative, the National Parks and Conservation Service, Forestry Service, NGOs and private sector land owners began to establish weeded and fenced plots to restore Mauritian native forests (small scale habitat restoration). These "Conservation Management Areas" (CMAs) have helped to save many species from extinction.

There are around 50 offshore islets. Many of these are very important for conservation either because some of the invasive species that are present on the Mauritian mainland never reached these islets or because it is possible to eradicate these species from islets. In recent years, a lot of habitat restoration and species recovery work has been done on these islets.

IUCN CONSERVATION STATUS RANKING SYSTEM

EW **Extinct in the wild**
Individual known to survive in cultivation, captivity or as a naturalised population(s) well outside the past range.

CR **Critically endangered**
Individual facing extremely high risk of extinction in the wild.

EN **Endangered**
Individual facing very high risk of extinction in the wild.

NT **Near Threatened**
Individual likely to qualify for a threatened category in the near future.

EX **Extinct**
No reasonable doubt that the last individual has died.

VU **Vulnerable**
Individual facing high risk of extinction in the wild.

LC **Least Concerned**
Individual widespread and abundant in the wild.



EN

Pink Pigeon
Nesoenas mayeri

Photo: Rajendranath Bhavnagadeen.



EN

Mauritius Kestrel
Falco punctatus

Photo: Dr. Nik Cole.



EN

Echo Parakeet
Psittacula eques

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Photo: Dr. Phillip Edwards.



Photo: Dr. Nik Cole.

VU

Telfair's Skink
Leiolopisma telfairii



Photo: Ms. Stephanie Ragaven.

CR

Mauritius Olive White Eye
Zosterops chloronothos



Photo: Dr. Phillip Edwards.

LC

Mascarene Paradise Flycatcher
Terpsiphone bourbonnensis



Photo: Dr. Phillip Edwards.

EN Mauritius Fody
Foudia rubra



Photo: Dr. Mik Cole.

LC Red Tailed Tropic Bird (Paille-en-queue)
Phaethon rubricauda



Photo: Mr. Pritesh Chooramun.

Mauritius Gecko
Phelsuma spp

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Photo: NPQS.



Mauritius Fruit Bat
Pteropus niger



Photo: Dr. Phillip Edwards.



Cuckoo Shrike
Coracina typica



Photo: Dr. Nik Cole.



Orange-tailed Skink
Gongylomorphus spp



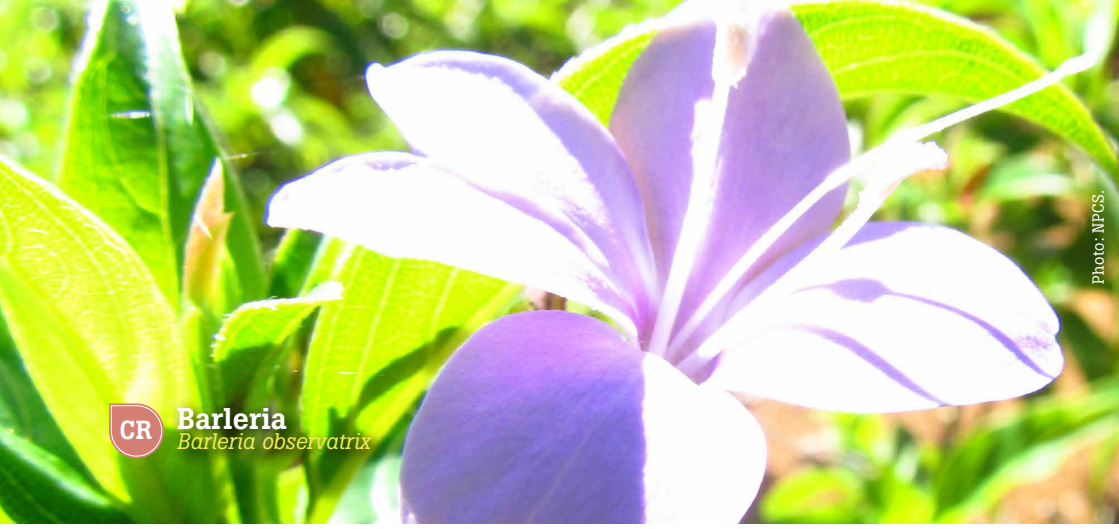


Photo: NPCS.

CR

Barleria
Barleria observatrix

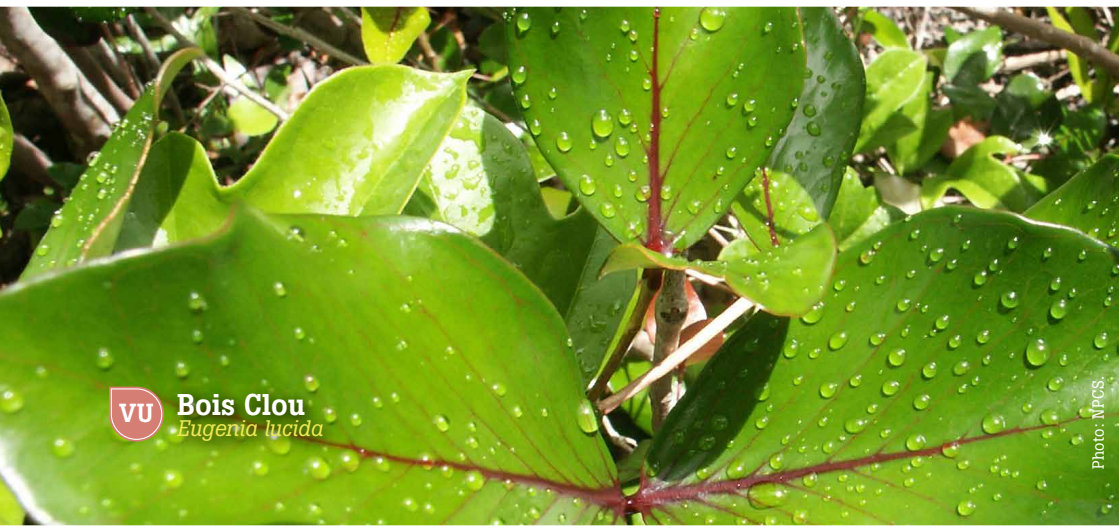


Photo: NPCS.

VU

Bois Clou
Eugenia lucida



Photo: NPCS.

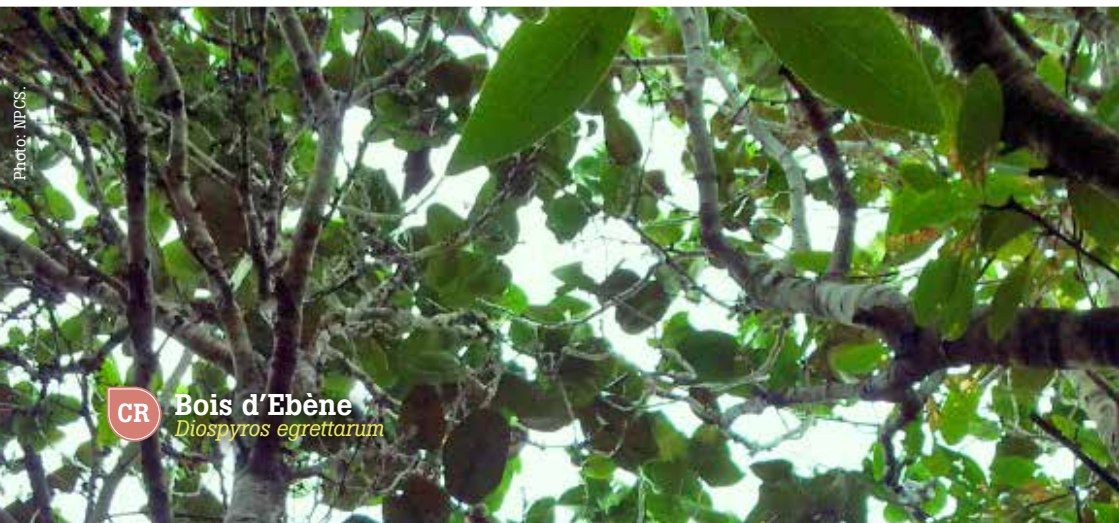
CR

Bois Boeuf
Polyscias maraisiana

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Baume de l'île Plate
Psiadia arguta



Bois d'Ebène
Diospyros egrettarum



Hibiscus Genevii
Hibiscus genevii



CR

Boucle d'Oreille
Trochetia boutoniana

Photo: NPCS.



CR

Bois Corail
Chassalia coriacea

Photo: NPCS.



VU

Bois de Judas
Cossinia pinnata

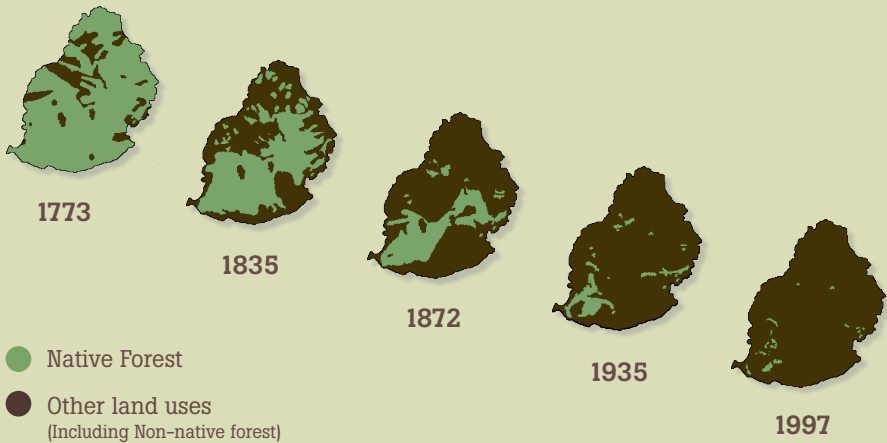
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Photo: NPCS.

Connecting the dots

The species recovery, small scale habitat restoration programmes on mainland Mauritius and the restoration work on islets have been outstanding examples of what can be done even under the most challenging of circumstances. Many of the building blocks of Mauritian endemic forests have been conserved. Now is the time to use these building blocks to create large and connected areas of restored endemic forests, a "Protected Area Network for Mauritius" that can secure our unique animals and plants and so much more.

The vision towards which we are working is "A protected area network for Mauritius that ensures that all the natural, social, cultural and economic values of our country's unique nature are effectively conserved, functionally restored, sustainably used, with all the necessary tools and safeguards in place and enjoyed by Mauritians now and into the future. The protected area network will represent a globally important example of innovative, evidence-based conservation that effectively strengthens the protection of all our ecologically sensitive areas in a changing world, maximises the benefits to humankind and inspires Mauritians and others to enjoy and protect their natural beauty, into perpetuity for the appreciation and benefit of all humankind."



Protected Area Network

The Protected Area Network Map shows how this vision could look, with the current isolated jewels ('the dots') connected.



Not just animals and plants

Safeguarding native animals and plants is a key function of a protected area. However, this is not its only role and other work is needed to ensure that the protected area is well managed.

The species in an area is a component of a bigger system that is the ecosystem. The latter performs various services that sustain human life on Earth. These functions are follows:

- Regulating Functions - Maintenance of essential ecological processes and life support systems.
- Supporting Functions - Providing habitat (suitable living space) for wild plant and animal species at local and regional scales.
- Provisioning Functions - Provision of natural resources.
- Cultural Functions - Providing life fulfilment opportunities and cognitive development through exposure to life processes and natural systems.

In addition, protected areas assist in the conservation of cultural heritage which can be defined as physical artifacts and intangible objects of a group or society that are inherited from past generations, maintained in the present and protected for the benefit of the future generations.

All protection and conservation activities and initiatives must be supported by appropriate legislation. Without a strong regulatory framework, preservation and conservation of native animals and plants, ecosystem services and cultural heritage may lack a certain level of security against the development pressures.

In addition, informing the public of the importance of native animals and plants is essential for the establishment of protected areas. Furthermore, there is need to highlight the contribution of protected areas to socio-economic sustainability and cultural heritage.

Managing protected areas implies performing multi-disciplinary tasks. Capacity building is thus critical to equip the staff with the needed skills and competencies for the efficient running and management of protected areas.

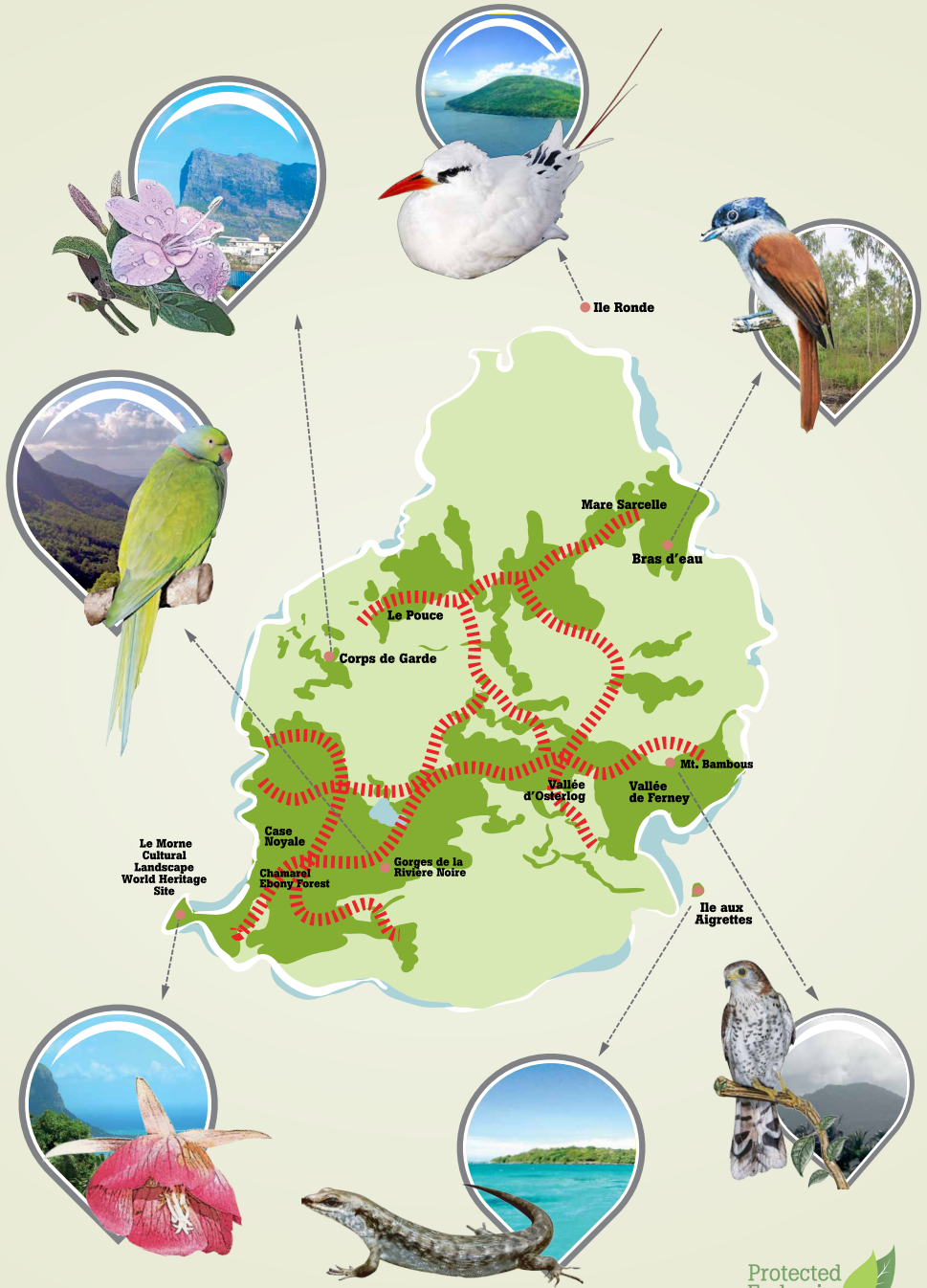


Photo: Jean François Pelletier.

Discover!!!

The following protected endemic sites are open to the public

Site	Attractions	Fees Applicable	Organisation in charge	Phone No
Bras d'Eau National Park	Native bird - Mascarene Paradise Flycatcher habitat, heritage vestige, wetlands, nature walks, visitor's centre.	No	National Parks and Conservation Service	4644053
Black River Gorges National Park	Native plants and animals, hiking trails, magnificent view points, waterfalls, demonstration sites of successful native forest restoration, visitor's centre at Petrin.	No	National Parks and Conservation Service	4644053
Rivulet Terre Rouge Estuary Bird Sanctuary	Ramsar site, wetlands, migratory birds, visitor's centre.	No	National Parks and Conservation Service	2172886
Sir Seewoosagur Ramgoolam Botanical Garden	37 ha garden, rare native and exotic plant species, monuments and the Château de Mon Plaisir (an old French colonial house).	Yes	SSR Botanical Garden Trust	2439401
Mon Vert Nature Reserve	Restored forest, nature walks, native tree specimens.	No	Forestry Service	6707254/55
Ile Aux Aigrettes	Lowland native forest, native plants and animals, beautiful landscape.	Yes	Mauritian Wildlife Foundation (MWF)	6312396
La Vallée de Ferney Nature Reserve	Beautiful landscapes, restored native forests, native plants and animals, old ebony trees, restaurant.	Yes	Vallée De Ferney Conservation Trust	6340440
Ebony Forest	Restored native forests, beautiful landscapes, native plants and animals, visitor's centre.	Not yet open to Public	Bioculture	6262503
La Vallée des 23 Couleurs	Native plants and animals, beautiful landscapes, sport activities, coloured earth.	Yes	La Vallée Des Couleurs Nature Park	52518666
Vallée d'Osterlog	Restored native forests, beautiful landscapes, hiking trails.	Yes	La Vallée d'Osterlog Endemic Garden Foundation	6709882



Protected Endemic Sanctuaries



**Nou leritaz sa,
bizin protez li!**

**MINISTRY OF AGRO INDUSTRY
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October 2015



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