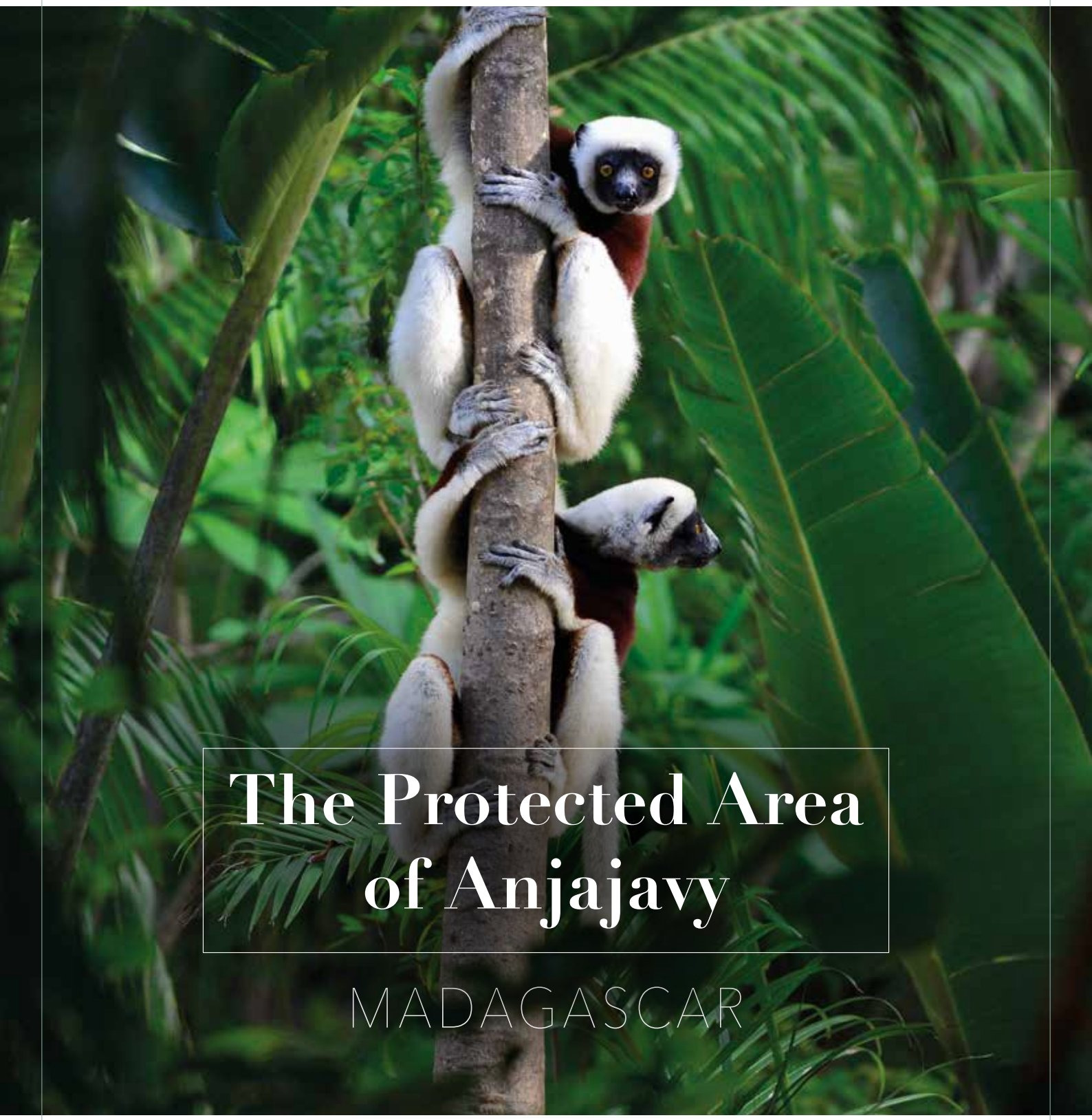
ANJAJAVY
le lodge



The Protected Area of Anjajavy

MADAGASCAR

RELAIS & CHATEAUX.

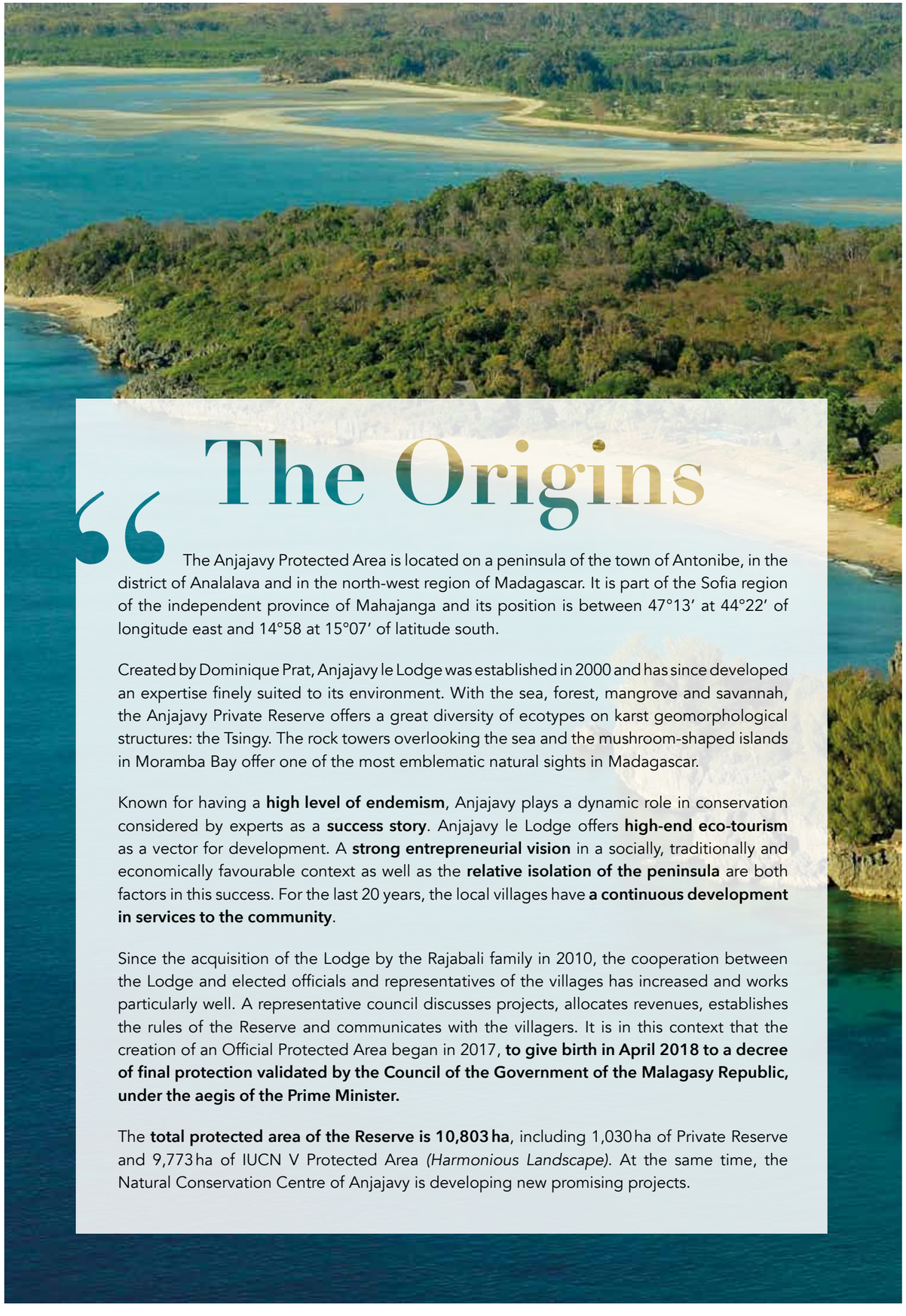
The Protected Area of Anjajavy

DECREE N° 2018-367

Hazo tokana tsy mba ala

One tree doesn't make a forest

Malagasy saying



The Origins

The Anjajavy Protected Area is located on a peninsula of the town of Antonibe, in the district of Analalava and in the north-west region of Madagascar. It is part of the Sofia region of the independent province of Mahajanga and its position is between 47°13′ at 44°22′ of longitude east and 14°58 at 15°07′ of latitude south.

Created by Dominique Prat, Anjajavy le Lodge was established in 2000 and has since developed an expertise finely suited to its environment. With the sea, forest, mangrove and savannah, the Anjajavy Private Reserve offers a great diversity of ecotypes on karst geomorphological structures: the Tsingy. The rock towers overlooking the sea and the mushroom-shaped islands in Moramba Bay offer one of the most emblematic natural sights in Madagascar.

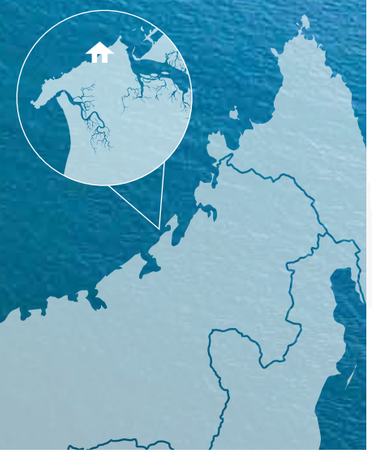
Known for having a **high level of endemism**, Anjajavy plays a dynamic role in conservation considered by experts as a **success story**. Anjajavy le Lodge offers **high-end eco-tourism** as a vector for development. A **strong entrepreneurial vision** in a socially, traditionally and economically favourable context as well as the **relative isolation of the peninsula** are both factors in this success. For the last 20 years, the local villages have **a continuous development in services to the community**.

Since the acquisition of the Lodge by the Rajabali family in 2010, the cooperation between the Lodge and elected officials and representatives of the villages has increased and works particularly well. A representative council discusses projects, allocates revenues, establishes the rules of the Reserve and communicates with the villagers. It is in this context that the creation of an Official Protected Area began in 2017, **to give birth in April 2018 to a decree of final protection validated by the Council of the Government of the Malagasy Republic, under the aegis of the Prime Minister.**

The **total protected area of the Reserve is 10,803 ha**, including 1,030 ha of Private Reserve and 9,773 ha of IUCN V Protected Area *(Harmonious Landscape)*. At the same time, the Natural Conservation Centre of Anjajavy is developing new promising projects.

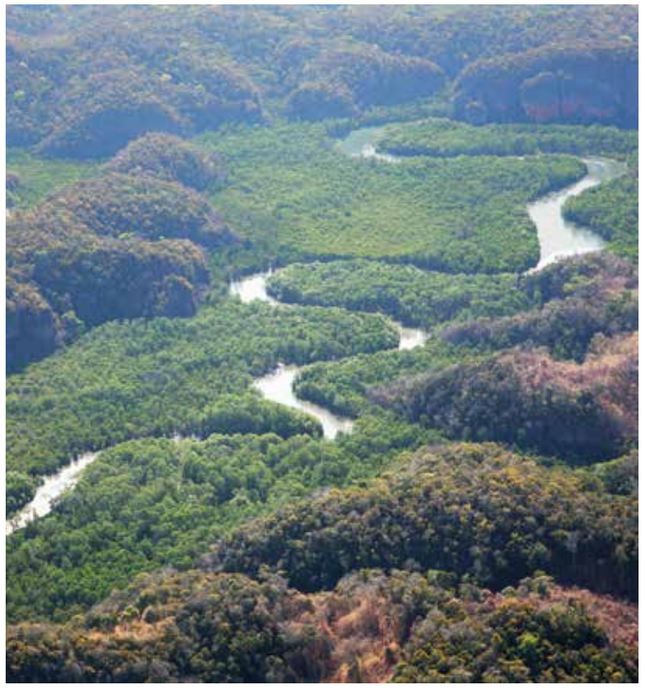
Summary

The lost world
OF ANJAJAVY



AN ISOLATED PENINSULA

Away from any road, covered with virgin beaches, forest, savannahs and mangroves, and set in a karst landscape, Anjajavy – a peaceful peninsula at the end of the world – is secluded from outsiders.



Anjajavy is situated on a peninsula in the north-west of Madagascar, a two hour flight from the capital. During the open season from March to December, the climate is always sunny.

A NATURAL PARADISE

Classified by WWF as a global priority in terms of conservation, the eco-region of deciduous dry forest of the north-west area of Anjajavy is a shelter to communities of rare and endemic faunal and floral species. Through its diversity, this natural environment is home to a great variety of plants and animals which are unique and harmless in some specific ecotypes. International naturalists know it, and few places in the world offer authentic contact with nature as intimate and safe as the Anjajavy peninsula.

A PLACE OF TRANQUILITY

Scattered with small traditional villages, the Anjajavy peninsula also offers a harmonious social environment where nature is a socio-economic integration tool and a driving force for sustainable development. It is also a place of inner-peace, with no ostentation, a reflection of the kindness of its people.

The art of living
& RECEIVING

FOR THE PROMOTION OF SUSTAINABLE DEVELOPMENT & THE PROTECTION OF MALAGASY BIODIVERSITY

Since 2004, Anjajavy le Lodge has been a member of the Relais & Châteaux association, from which it was awarded the **Environment Trophy** and with which it deeply shares the values of excellence of the hotelier-restaurateur profession.

Anjajavy le Lodge is cited as an example by the Relais & Châteaux association in the Manifesto for a better world presented in 2014 during the UNESCO Intangible World Heritage Convention.

The team at the Lodge and the Private Reserve is entirely Malagasy and 80% originate from the neighboring villages.

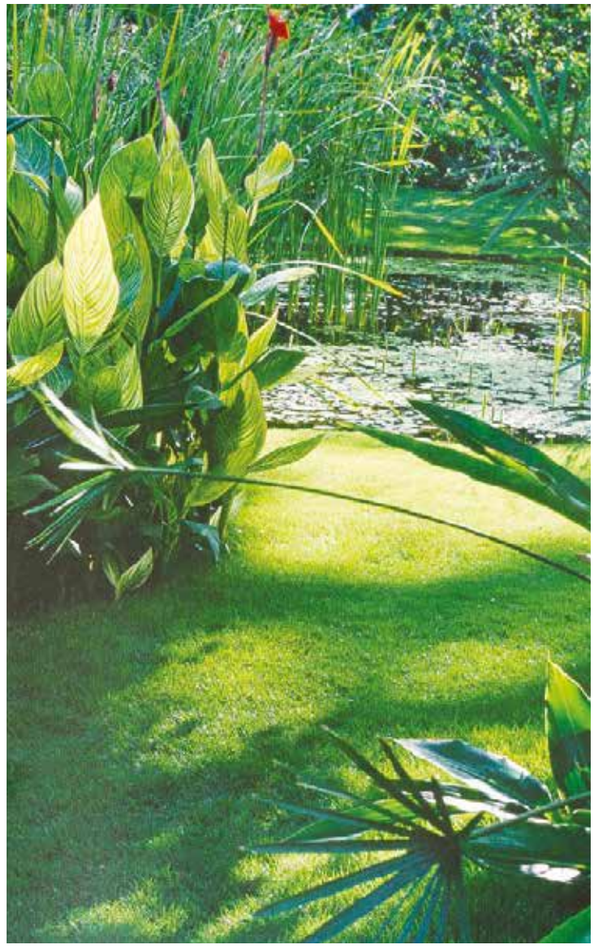
An integrated
LODGE

Built in two years following great logistical efforts, the Lodge is composed of a central building facing a fifty years old coconut grove. 24 villas made of palissandre wood are scattered throughout a garden and beach landscape.

On the ground floor, each villa has a large veranda and a large living/sleeping area. The bathroom is equipped with a sink, a corner bathtub with a shower, with adjacent toilets and a bidet.

A silent air-conditioning system maintains the villa at an ideal temperature. A Japanese staircase leads to the upper floor which can be used as a children's or guest room, and can accommodate up to two people.

Yves Boucharla, an architect from Lyon, France, who previously worked on the Brasseries of Paul Bocuse, **paid tribute to the Sakalava traditional villages with a refined and elegant architecture**, unanimously acclaimed. The whole facility is cleverly integrated in a Malagasy garden.



The MAGICAL garden of the Oasis

Camille Muller,
Landscaper of the Oasis

A GOOD PLEASANT OFFERING NATURE

The Oasis is a wet biotope, including **carefully selected plants representative of the huge territory of Madagascar**. Created by Camille Muller, a renowned French landscaper and great lover of Madagascar, it is located at the heart of the Lodge, behind the villas of the Lodge.

A system of spray misters maintains a constant hygrometry and maintains a pleasant cooling sensation during the hottest hours. Tea, cool drinks and cakes are served every afternoon. One can discover a wide floral diversity brilliantly arranged including papyrus, tree ferns, all types of creepers and rare palm trees. It is in this vegetation where the Souimanga Sunbirds, the Malagasy Kingfishers and the Malagasy Paradise Flycatchers take refuge. The pond attracts frogs and chameleons, and the canopies of the flourishing trees surrounding it are the playground for groups of lemurs, whose wild nature is carefully preserved, for the great enjoyment of the guests.

THE NATURAL HABITATS

A RARE & PRECIOUS

Dry Deciduous Forest

A CRITICALLY ENDANGERED HABITAT

Madagascar is a botanical paradise, with more than 13,000 indigenous species including 900 orchid varieties, 200 palm tree species and 130 species of aloes. The island is so large and has such a diversity of habitats and climates that each corner of Madagascar has its own special community of plants. Anjajavy finds itself amongst the community of the dry deciduous forests of the North-West; an eco-region recognised by the major international organisations of nature conservation as a **global critical priority for conservation.** *(Cf. articles WWF attached in appendices)*

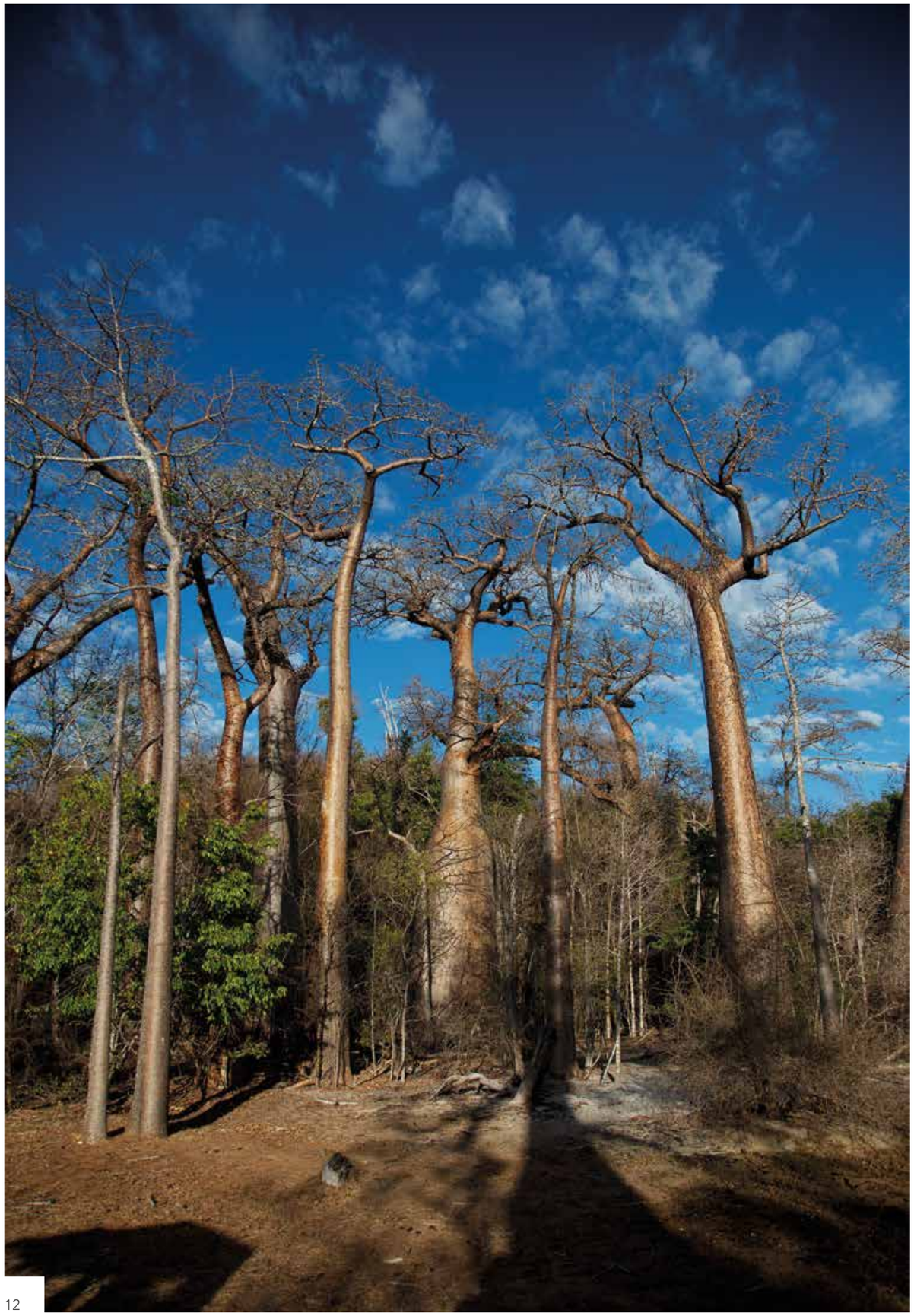
Characterised by an exceptional endemism as a result of speciation due to adaptation to the long dry season, to the karst boulders and to the ocean sprays, the Anjajavy forest represents a botanical treasure. For naturalists and amateurs of plants, there is a lot to see: aloes, euphorbias, bottle-creepers, giant vanilla beans growing on the sharp limestone formations of the Tsingy. The endemic ebony and rosewood trees are also plentiful. Much of the flora in the Protected Area has not been identified. **New species are regularly being discovered** in particular from December to April throughout the rainy season.

The Tsingy

WITH UNIQUE SHAPES

A COMPLEX LINK BETWEEN HABITATS

The Anjajavy Protected Area and its surroundings include a remarkable geological phenomena of rare beauty: the Tsingy. This karstic and highly rugged landscape is the dramatic expression of an evolutionary stage of the earth, taking the shape of a “stone forest”, with limestone towers and spurs as high as 30 meters, all within the forest and in the middle of the sea. Nature has adapted itself to these labyrinths for millions of years and has formed unique natural shows of caves, grottos, highland areas, gorges and walls of rugged rocks. **Due to their inaccessibility and their resistance to fire, the Tsingy has provided protection for numerous parts of the primary forest. Its relative isolation fosters speciation.** A unique nature is enshrined.



A LAND of Baobabs

WISDOM IS LIKE A BAOBAB TREE: NO ONE CAN EMBRACE IT ALONE

The majestic baobab tree is an emblem of Madagascar. The large island is home to seven species of baobabs, of which six are endemic. In Anjajavy, you will encounter three species of baobabs: the Grey *(Adansonia madagascariensis)*, the African *(Adansonia digitata)* and the Fony Baobab *(Adansonia rubrostipa)*. The latter, endemic to the eco-region is red and gold in color with patterns looking as if they were hand-painted.

The baobab trees clinging to the Tsingy islands in the turquoise waters of Moramba Bay shape one of Madagascar's most spectacular and magical landscapes.

These swollen giants have many outstanding qualities. They are the **longest living flowering plants on earth** - with some living up to 2,000 years. These trees are true survivors, withstanding terrible droughts and fierce storms, and they can grow on bare rock on sea isles. They can even live and grow wrapped around each other, as if in love.

Every baobab has its own shape, its own character, its own story. It is therefore not surprising that these incredible trees are **revered by the local people**, and that some of them are held as sacred. People make offerings at the base of the baobab, such as zebu horns, coins, rum or honey in the hope of receiving protection from the ancestors.

A SINGULAR
Marine Park

The private peninsula of the Lodge is bordered by seven isolated coves over a length of 3,500 meters facing the Mozambique Channel. **Along this coast, a strip of sea 400 meters long has been protected from fishing and hunting since the construction of Anjajavy le Lodge in 2000, and since April 2018, by the decree of final protection of the Anjajavy Protected Area.**

The rich marine life of this nature Reserve benefits from the proximity of the mangroves and forests. Tropical fish are found in large numbers and in great variety. Each year, green turtles come and lay eggs on these beaches which are without doubt the same beaches of their birth. The hatching of the eggs and the race to the sea by the baby turtles offer one of nature's most unforgettable experiences.

A private walking path follows the cliffs of the coast and enables observation of magnificent panoramas of unspoilt nature. Beyond the border of this protected marine park, canoes, dhows or schooners are picturesque reminders of the traditional and peaceful character of the region.

THE MORAMBA BAY

A POTENTIAL CANDIDATE FOR UNESCO'S PROTECTION

The very diverse karstic land formation of Anjajavy meets the Mozambique Channel in sumptuous landscapes. Along the coast, the jagged cliffs of many marine Tsingy rise close to 30m out of the water. It is at a distance of 12 kms from the coves of the Lodge that this scenery culminates: the Moramba Bay seems like a garden of sculptures elegantly perched on rocky pedestals. Wonders of nature, often sacred, these limestone rock spires are **used as princely burial sites since time immemorial.** They are surmounted by a unique vegetation resistant to the long dry season and to the salty sea spray. On this rocky outcrop, pairs of Malagasy Fish Eagle *(Haliaeetus vociferoides)* look out for fish from the canopy of millennial red baobab trees.

A VITAL LABYRINTH
of Mangrove Swamps

The Anjajavy Protected Area is protected to the north and west by three wide, separate mangroves and their winding tidal channels. These wetland ecosystems are an example of the vital service nature provides to human beings on a global scale. The **mangrove rivers flanking the Anjajavy Forest form excellent natural borders to the Protected Area and convenient transportation routes to visit.**

The mangroves of Anjajavy comprise a great number of species of trees and shrubs adapted to salty water. One of them, the Jajavy (*Salvador angustifolia)* has given its name to the village. The root entanglement forming stilts or buttresses, the thick mud and the daily tidal action forms an excellent haven, nursery and larder for terrestrial and aquatic fauna. Hundreds of species of fish, shellfish, insects and birds depend on this habitat for food and shelter. In Anjajavy, the mangrove swamps protect the natural Reserve of dry deciduous forest as well as the Marine Reserve. This biotope simultaneously serves as a curtain of protection against strong and salty winds, a fire-wall, a damp buffer useful to the forest during the dry season and as filter against the turbidity of the coastal waters. **The two rivers of mangroves on both sides of the Anjajavy forest constitute excellent natural borders for the Protected Area as well as practical transportation routes which allow for better exploration.**

In general, the mangroves also provide human beings with vital services; the pneumatophore roots help to stabilise the soft soils and to protect the coast line against erosion and natural catastrophes. On a global scale, these habitats capture carbon in their sediments, where it can remain for centuries. The mangroves are therefore one of the **most efficient natural carbon sinks in the world, with rates or carbon sequestration up to 50 times greater than those of tropical forests.**

The phytoplankton and plankton of the mud constitute the point of origin of food supply chains which provide to the precious fish needed for the second economic source of Anjajavy: the traditional fishing industry.

Références :

Dr Emily Pidgeon. Carbon burial by marine coastal habitats. Some important carbon sinks in shortage. Management of coastal natural resources (carbon sinks). IUCN. 2009. Report on the global efforts aiming to attenuate climate change. See quotes at the end of this document.

AN EXCEPTIONAL BIODIVERSITY

The Biodiversity OF ANJAJAVY

A WEALTH TO DISCOVER AND PROTECT

The inventories and observations of the animal and plant species of Anjajavy are testimony to its great biological wealth, with no fewer than five critically endangered species, 15 in danger of extinction and 13 vulnerable to extinction. The large majority of these species are endemic to Madagascar or to the nearby region. Each year naturalist observations from our visitors – scientific or amateur – keep updating a significant number of new or described species. Some of them, like the *Tahina spectabilis* Palm Tree, led to great excitement in the scientific community. Here, biodiversity is exceptional not just for the great joy and satisfaction it brings to eco-tourists, but also for science. Due to unsustainable human activity, dry forest habitats disappear at a very high rate. **The high-end eco-tourism of Anjajavy is an economic alternative for the coastal communities and an opportunity to organise the sustainability of natural resources.** The customers of Anjajavy le Lodge ask to see concrete results. Each visitor contributes to the greater knowledge and protection of this endangered ecosystem.

A great example of the scientific potential of Madagascar biodiversity is the endemic Madagascan periwinkle, source of vincristine, used by modern pharmacopeia against leukemia.

SOME SUPPOSEDLY NEW SPECIES OF ANJAJAVY

PRESUMED TAXON	SUGGESTED COMMON NAME	PRESENCE / SIGHTINGS
Pseudoxyrhopus sp.	Black/Purple Cave Snake	Seen/photographed in April 2016 in the Southern part of the large Forest Nature Reserve of Anjajavy.
Cinnamosma fragrans sp.	Saro of Anjajavy	3 old specimens in the large Nature Reserve of Anjajavy. Reforestation in the private nature reserve since 2009.
Microcebus danfossi sp.	Microcebus of Anjajavy	Hypothesis formulated on the basis of morphological differences.
Lepilemur edwarsi sp.	Lepilemur of Anjajavy	Hypothesis formulated by R. Mittlermeier (*IUCN lemur expert, PhD. Harvard University)* on the basis of morphological differences.
Aloe foucaltus sp.	Aloe of Anjajavy	Very localised and very visible on a tsingy of the nature reserve.
Trachylepis sp.	Scinke of Anjajavy	Seen and photographed by herpetologist M. Hanlon in Nov. 2014. Occasional sightings by the guides of the Anjajavy Reserve.
Blaesodactylus sakalava sp.	Sakalava Velvet Gecko	Occasional nocturnal sightings.
Scaphiophryne sp.	Scaphiophryne of Anjajavy	Seen and photographed by herpelogist M. Hanlon in Nov. 2014. Sightings by the guides and trackers in the deciduous forests and in the swamps.

FIVE CRITICALLY ENDANGERED SPECIES
Listed in Anjajavy *(IUCN Status)*

SCIENTIFIC NAME	COMMON NAME	PRESENCE / SIGHTINGS
Haliaeetus vociferoides	Malagasy Fish Eagle	1 to 2 couples on the marine protected area of Anjajavy, 6 to 10 couples in the nearby region at 20 kms.
Erynochelys madagascariensis	Madagascar Big-headed Turtle	Important sightings in the nearby region at 15 kms. Awareness/ reintroduction/ protection programme in the Anjajavy Reserve since 2015.
Tursiops aduncuns	Bottlenose Dolphin	Occasional sightings by the seamen of the Anjajavy Protected Area.
Tahina spectabilis	Explosive Palm of Madagascar	Native of a unique site at 30 kms of the Anjajavy Protected Area. Reforestation program in Anjajavy Protected Area since 2010.
Dypsis leptocheilos	Teddy Bear Palm	*(Introduced)* Belonging to the collection of rare species of the Oasis.

Tahina spectabilis inflorescence is one of the largest of all existing palms

CRITICALLY ENDANGERED

THE MALAGASY **Fish Eagle**

A BIRD REFLECTING THE STATE OF ITS HABITAT

The Malagasy Fish Eagle *(Haliaeetus vociferoides)* called «Ankoay» in Malagasy, is a large bird of prey endemic to the coastal strip North-West of Madagascar.

Various estimations place the number of remaining breeding pairs to be between 40 and 150. **This bird may therefore be one of the rarest on Earth.** We must act fast in order to protect the three to six pairs between Anjajavy Protected Area and Moramba Bay.

The main threats for the future of this majestic bird at the top of the food chain are ones destroying its breeding habitat such as deforestation, soil erosion and the development of wetlands for rice fields. It is also in direct competition with fishermen for fish stocks.

CRITICALLY ENDANGERED

The focus of the preservation in Anjajavy is currently on the large Anjajavy forest, a wetland area of 1,400 hectares *(3,500 acres)* comprised of tannes and mangroves, as well as a 168 hectares marine strip facing the creeks of the Lodge where fishing is prohibited. The contribution of the Lodge towards the preservation of an adjacent larger marine area along the coast up to the site near Moramba Bay where two to three pairs live, could be envisaged in the near future.

References:

> *«United Nations Environment Programme: Madagascar Fish Eagle». unep-wcmc.org. 2007-05-22.*

> *Nick Garbutt, C. Michael Hogan, Hilton Hastings,Wendy Pollecutt, Tahiana Andriaharimalala (2006-05-12). «Anjajavy the village and the forest». LuminaTechnologies.org.*

> *Rebecca L. Grambo, «Eagles» Published by Voyageur Press, Inc.*

The Tahina Palm

A GIANT WHICH ONLY FLOWERS ONCE IN ITS LIFE

The Explosive Palm of Madagascar *(Tahina spectabilis)* was discovered in 2006 by a French family picnicking near Moramba Bay.

The Island of Madagascar is home to more than 200 types of palm tree 90% of which don't exist anywhere else in the world. The Explosive Palm is so different from other palms that it warranted the creation of a completely **new genus,** the Tahina. Its genetic evolutionar line is a real curiosity for the scientific community. Its closest relatives are found in Vietnam, South China, Thailand and Afghanistan. How, and during which period was it possible for the ancestor of the Tahina to reach the island of Madagascar?

Xavier Metz (at the left) discoverer of The Tahina Spectabilis

Another rare feature of this palm is that it only flowers once in its life after 50 to 100 years bursting into one of the largest inflorescence of all existing palms *(six to eight meters)*, then dying. With a height of 15 meters and with leaves as wide as five meters, this giant is extremely rare with only 92 specimens and about 100 shoots identified in this habitat of origin.

It was subsequently chosen as one of the top natural discoveries of 2008, 2009 and 2010. Protection measures on the natural habitat have been put in place. Reforestation in the northern restoration zone of Anjajavy Protected Area, less than 30kms from its place of discovery, seems to be a good way to preserve this palm in its native habitat while generating revenue for the riparian villagers through the sale of seeds.

Références :

> *Xavier, Nathalie Metz, interview of 2012, co-finder of the species, AJJ*

> *Palms of Madagascar, John Dransfield (Royal Botanical Gardens of Kew, UK)*

> *WIRED magazine, Top strange discoveries of 2008, wired.com/2009/05*

> *DISCOVER Magazine, Most Amazing New species of the year, Jill Neimark, 25/01/2010, discovermagazine.com/2010/jan-feb/33*

> *Official Presentation of the discovery on 17 January 2008 at the Fairchild Tropical Botanic Garden (Florida, USA).*

14 ENDANGERED SPECIES
Listed in Anjajavy *(IUCN Status)*

SCIENTIFIC NAME	COMMON NAME	PRESENCE / SIGHTINGS
Propithecus coquereli	Coquerel's Sifaka	Very visible and often seen. About 300 to 500 individuals in the Private Reserve of Anjajavy *(Cf. Notes)*. Some groups are accustomed to humans but remain wild. Feeding of the lemurs is a major violation of the Lodge rules and regulations.
Microcebus danfossi	Danfoss' Mouse Lemur	Occasional sightings by the guides and forest rangers of Anjajavy. The species present in Anjajavy could be a new species of lemur according to the assumptions of R. Mittermeier, *(IUCN lemur expert)*.
Microcebus ravelobensis	Golden-Brown Mouse Lemur	Very visible and often sighted in the Private Reserve of Anjajavy during night walks.
Lepilemur edwarsi sp.	Milne's Edwards' Sportive Lemur	Population estimated to be about 100 in the large Anjajavy Reserve. Based on morphological criteria and on the assumptions of R. Mittermeier, the species visible in Anjajavy could be a new one.
Lepilemur grewcockorum	Grewcock's Sportive Lemur	Population estimated to be about 30 individuals in the large Anjajavy Reserve.
Daubentonia madagascariensis	Aye-aye	Traces of its presence. Occasional sightings reported by the villagers at the south border of the large Anjajavy Reserve. Widespread before the 1990's in the Anjajavy forest. Since 2015, a reintroduction programme of the Aye-aye is in progress in the Anjajavy Reserve together with the Universities of Antananarivo and the support of the University of Duke *(USA)*.
Threskiornis bernieri	Malagasy Sacred Ibis	Rare sightings since 2015 of this bird - previously very visible in the mangroves of the Anjajavy Protected Area and around Moramba Bay.
Ardeola idae	Malagasy Pond Heron	Regularly sighted in the mangroves of the Protected Area by the guides and customers of the Lodge.
Ardea humbloti	Humblot's Heron	The population seems to be in decline.
Heteroliodon fohy	Stout Dwarf Snake	Occasional sightings by forest rangers in the large Anjajavy Protected Area.
Phisalixella variabilis	Northern Banded Tree Snake	Very present but seldom seen due to anthropic pressures.
Pristis clavata	Dwarf Sawfish	Present in a zone 30 kms around the Marine Reserve. Fished by the fishermen, awareness to be raised.
Caretta caretta	Loggerhead Sea Turtle	Rare sightings by the fishermen of Anjajavy. The animal is eaten and is liked for its meat.
Chelonia mydas	Green Sea Turtle	Two to three eggs laying nests per year on the beaches of the Marine Reserve and in the vicinity. The animal is fished and eaten/liked as well as its eggs. The reward programme for the nests led by Anjajavy le Lodge since 2013 enables the increase in the number of egg-laying sites which are protected up to hatching.

13 SPECIES VULNERABLE TO EXTINCTION
Listed in Anjajavy *(IUCN Status)*

SCIENTIFIC NAME	COMMON NAME	PRESENCE / SIGHTINGS
Tachybaptus pelzelnii	Madagascan Grebe	Present but rare. The guides and forest rangers of the Anjajavy Protected Area report a slight decrease year by year in the number of sightings of this small duck.
Glareola ocularis	Madagascan Pratincole	Present but rather rare. Guides and forest rangers of the Anjajavy Protected Area report a slight decrease year by year in the number of sightings of this shorebird.
Spinomantis massorum	Spinomantis Massi	Very visible frog in the Anjajavy Protected Area. Numerous sightings by the guides and clients of Anjajavy le Lodge.
Rhincodon typu	Whale Shark	Present but seldom seen since 2010.
Pteropus rufus	Madagascan Flying Fox	Presence of a group estimated to be about 100 individuals in the humid Anjajavy Protected Area. The animal is hunted for its meat. The size of the group seems to increase since the community awareness campaigns of 2012-2013.
Uroplatus ebenaui	Leaf-tail Gecko	Recent increase of the number of sightings/photographs of this leaf-tail gecko by visitors and guides of the Reserve.
Paroedura vazimba	Vazimba Gecko	Regular sightings/photographs by the guides and visitors of the Anjajavy Reserve.
Epinephelus lanceolatus	Giant Grouper	Present in the protected marine area. Multiple sightings by seamen. Subjected to a purchasing/consumption ban implemented by Anjajavy le Lodge.
Eidolon dupreanum	Madagascan Fruit Bat	New site discovered 40kms from the Marine Reserve. Number estimated to be 200 individuals. Residents of the area are remunerated for each sightseeing tour.
Dypsis decaryi	Triangle Palm	Collection of rare plants of the Oasis. *(Introduced)*
Cryptoprocta ferox	Fossa	A female has chosen a permanent annual breeding site in the private Anjajavy Reserve since 2014. A hen-thief male was killed by new villagers in 2015. The unfortunate event resulted in awareness-raising measures *(cf. calendar)*.
Dugong dugon	Dugong	Rare sightings by the villagers within a 10km radius in the Marine Reserve of this sirenian previously more common in the area. The animal is hunted by fishermen of the area. An awareness campaign is in progress but must be reinforced.
Lygodactylus madagascariensis	Madagascar Dwarf Gecko	Common in the Anjajavy Protected Area. Subservient to the deciduous forests of the Protected Area.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Lemurs OF ANJAJAVY

COMPLETELY FREE AND WILD

The Anjajavy le Lodge lemurs are easy to observe in their natural environment. A fascinating sight: here you are, around the pool, and suddenly a group appears on the manicured lawn of the Lodge. These adorable and harmless animals bounce, standing on their two hind legs, in single file and climb the trees around the Oasis. They share the branches, with the females having the first right of choice. Whilst feeding, they twist and stretch in search of the most tender shoots. Some hang off branches upside-down, in elegant positions. These acrobats are the beautiful Coquerel's Sifakas, a type of lemur endemic to the North-West of Madagascar.

These animals rub shoulders with many of their cousins in the Protected Area. Other species of lemurs run free in the neighbouring gardens and the Protected Area in search of food according to the law of nature. They are never fed by staff or visitors, but they make the most of the green tranquility of the gardens of Anjajavy le Lodge. Their life is that of wild animals ; they must for instance be careful of their natural predators like the Madagascan Boa often lying in ambush, the skillful and quiet Fossa or the Madagascan Harrier-hawk.

A species of lemur originally in the Reserve, the strange Aye-aye, was wiped out well before the creation of the Lodge 30 years ago. The animal was hurt by local superstitions. Through eco-tourism, mentalities have progressed. With the support of the veterinary department of the University of Antananarivo, the Lodge is now conducting a programme of research and reintroduction in the Anjajavy Protected Area of this animal in danger of extinction.

8 SPECIES OF LEMUR PRESENT IN ANJAJAVY

	NAME OF THE SPECIES	COMMON NAME	FREQUENCY OF OBSERVATION
1	*Propithecus coquereli*	Coquerel's Sifaka	●●●●●●●●●●
2	*Eulemur fulvus*	Common Brown Lemur	●●●●●●●●●○
3	*Cheirogaleus medius*	Fat-Tailed Dwarf Lemur	●●●●○○○○○○
4	*Daubentonia madagascariensis*	Aye-aye	●○○○○○○○○○
5	*Lepilemur edwarsi sp.*	Milne's Edwards' Sportive Lemur	●●●○○○○○○○
6	*Microcebus ravelobensis sp.*	Golden-brown Mouse Lemur	●●●○○○○○○○
	Microcebus danfossi	Danfoss' Mouse Lemur	●●●●●●●●○○
	Lepilemur grewcockorum	Grewcock's Sportive Lemur	●●○○○○○○○○


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AN ABUNDANCE **of Birds**

A PARADISE FOR BIRDS & FOR BIRD WATCHERS

Inventories have documented the presence in the Protected Area of **more than 134 different bird species.**

Numerous magnificent birds, rare and endemic, can be observed by naturalists and birdwatchers, the most enthusiastic of which know the international reputation of Anjajavy.

Anjajavy is for instance, one of the best places in the world to see the Malagasy Fish Eagle *(Halliaeetus vociferoides)*, the shy Madagascan Crested Ibis 1 *(Lophotibis cristata)* and the elegant Madagascan Sacred Ibis 2 *(Threskiornis bernieri)*.

The freshwater lakes in the vicinity are a refuge for the Dendrocygninae *(Thalassornis leuconotus, Dendrocygna viduata, Dendrocygna bicolor)*, several species of wild ducks *(Anas erythorhyncha, Anas hottentota, Sarkidiornis melanotos)* and a great number of waders *(Butorides striatus, Calidris alba, Ardea cinerea* 3*, Ardea goliath, Ardea humbloti, Ardea purpurea, Ardeola idea, Ardeola ralloides…)*.

The gardens and immediate surroundings of the Lodge are not to be outdone, with a diverse array of colors such as the metallic green Sunbird *(Nectarnia souimanga)*, the red Madagascan Fody 4 *(Foudia madagascariensis)*, the yellow headed Sakalava Weaver 5 (*Ploceus sakalava)* as well as a kaleidoscope of shapes such as the Malagasy Flycatcher *(Terpsiphone mutata)* and its thin tail, the Madagascan Hoopoe *(Upupa epops marginata)* and its speckled crest or the Sickle-billed Vanga 6 with its long hook-tipped bill. Almost daily, flocks of Madagascan Grey-headed Lovebirds *(Agapornis cana)* dance a ballet whilst feeding on seeds on the lawn as customers enjoy their breakfast nearby.


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134 SPECIES OF BIRDS
Listed in Anjajavy

Accipiter henstii	Henst's Goshawk	*Butorides striatus*	Striated Heron	*Coua ruficeps*	Red-Capped Coua
Accipiter madagascariensis	Madagascan Sparrowhawk	*Calidris alba*	Sanderling	*Cuculus rochii*	Madagascan Cuckoo
Accipiter francesii	France's Sparrowhawk	*Calidris ferruginea*	Curlew Sandpiper	*Cyanolanius madagascarinus*	Blue Vanga
Acridotheres tristis	Common Myna	*Caprimulgus madagascariensis*	Madagascar Nightjar	*Cypsiurus parvus*	African Palm Swift
Actitis hypoleucos	Common Sandpiper	*Casmerodius albus*	Great Egret	*Dendrocygna bicolor*	Fulvous Whistling Duck
Actphilornis albinucha	Madagascan Jacana	*Centropus toulou*	Malagasy Coucal	*Dendrocygna viduata*	White-Faced Whistling Duck
Agapornis cana	Grey-Headed Lovebird	*Charadrius hiaticula*	Common Ringed Plover	*Dicrurus forficatus*	Crested Drongo
Anas erythorhyncha	Red-Billed Teal	*Charadrius leschenaultii*	Greater Sand Plover	*Dromas ardeola*	Crab-Plover
Anas hottentota	Hottentot Teal	*Charadrius marginatus*	White-Fronted Plover	*Dryolimnas cuvieri*	White-Throated Rail
Anastomus lamelligerus	African Openbill	*Charadrius pecuarius*	Kittlitz's Plover	*Egretta ardesiaca*	Black Heron
Anhinga rufa	African Darter	*Charadrius tricollaris*	Three-Banded Plover	*Egretta dimorpha*	Dimorphic Egret
Apus balstoni	Malagasy Black Swift	*Cisticola cherina*	Madagascan Sisticola	*Eurystomus glaucurus*	Cinnamon Roller
Apus melba	Alpine Swift	*Columba livia*	Rock Dove	*Falco eleonorae*	Eleonora's Falcon
Ardea cinerea	Grey Heron	*Copsychus albospecularis*	Madagascan Magpie-Robin	*Falco newtoni*	Malagasi Kestrel
Ardea goliath	Goliath Heron	*Coracina cinerea*	Madagacan Cuckooshrike	*Falco peregrinus*	Peregrine Falcon
Ardea humbloti	Humblot's Heron	*Coracopsis nigra*	Lesser Vasa Parrot	*Falco zonoventris*	Banded Kestre
Ardea purpurea	Purple Heron	*Coracopsis vasa*	Greater Vasa Parrot	*Falcon concolor*	Sooty Falcon
Ardeola idae	Malagasy Pond Heron	*Corvus albus*	Pied Crow	*Falcuela palliata*	Sickle-Billed Vanga
Ardeola ralloides	Squacco Heron	*Corythornis vintsiodes*	Malagasy Kingfisher	*Foudia madagascariensis*	Red Fody
Aviceda madagascariensis	Madagascar Cuckoo-Hawk	*Coturnix coturnix*	Common Quail	*Fregata ariel*	Lesser Frigate Bird
Bubulcus ibis	Cattle Egret	*Coua coquereli*	Coquerel's Coua	*Fregata minor*	Great Frigate Bird
Buteo brachypterus	Madagascar Buzzard	*Coua cristata*	Crested Coua	*Fregetta grallaria*	White-bellied Storm Petrel

134 SPECIES OF BIRDS
Listed in Anjajavy

Fregetta tropica	Black-bellied Storm Petrel	*Numenius arquata*	Eurasian Curlew	*Sarkidiornis melanotos*	Knob-billed Duck
Gallinula chloropus	Common Moorhen	*Numenius phaeopus*	Whimbrel	*Saxicola sibilla*	Madagascan Stonechat
Glareola ocularis	Madagascan Pratincole	*Numida meleagris mitrata*	Tufted Guinea Fowl	*Scopus umbretta*	Ombrette africane
Haliaetus vocifer	African Fish Eagle	*Nicticorax nycticorax*	Black-Crowned Night Heron	*Sterna bergii*	Greater Crested Tern
Himantopus himantopus	Black-winged Stilt	*Oena capensis aliena*	Namaqua Dove	*Sterna dougallii*	Roseate Tern
Hypsipetes madagascariensis	Malagasy Bulbul	*Otus rutilus*	Rainforest Scops Owl	*Sterne albifrons/ suandersi*	Little Tern/ Saunder's Tern
Ispidina madagascariensis	Madagascar Pygmy Kingfisher	*Phalacrocorax africanus*	Reed Cormorant	*Sterne bengalensis*	Lesser Crested Tern
Ixobrychus minutus	Little Bittern	*Phedina borbonica*	Mascarene Martin	*Streptopelia picturata*	Malagasy Turtle Dove
Leptopterus chabert	Chabert Vanga	*Phoenicopterus minor*	Lesser Flamingo	*Sula sula*	Red-Footed Booby
Leptopterus Viridis	White-headed Vanga	*Phylastephus madagascariensis*	Long-Billed Berniera	*Tachybaptus pelzelnii*	Madagascan Grebe
Leptosomus discolor	Cuckoo Roller	*Platalea alba*	African Spoonbill	*Tachybaptus ruficollis*	Little Grebe
Lonchura nana	Madagascar Manikin	*Plegadis falcinellus*	Glossy Ibis	*Terpsiphone mutata*	Malagasy Paradise Fly-Catcher
Lophotibis cristata	Madagascan Ibis	*Ploceus sakalava*	Sakalava Weaver	*Thassalornis leuconotus*	White-Backed Duck
Merops ciperciliosus	Olive Bee-Eater	*Pluvialis squatarola*	Grey Plover	*Threskiornis bernieri*	Malagasy Sacred Ibis
Milvus migrans	Black Kite	*Polyboroydes radiatus*	Madagascar Harrier-Hawk	*Treron australis*	Madagascan Green Pigeon
Mirafra hova	Madagascan Iark	*Porphyrio porphyrio*	Western Swamphen	*Tringa cinerea*	Terek Sandpiper
Motacilla flaviventris	Madagascan Wagtail	*Porphyrula alleni*	Allen's Gallinule	*Turnix nigricollis*	Madagascan Buttonquail
Nectarinia notata	Malagasy Green Sunbird	*Porzana pusilla*	Baillon's Crake	*Tyto alba*	Barn Owl
Nectarnia souimanga	Souimanga Sunbird	*Pterocles personatus*	Madagascan Sandgrouse	*Upupa epops Marginata*	Madagascan Hoopoe
Neomixis tenella	Common Jery	*Puffinus iherminieri*	Audunbon's Shearwater	*Vanga curvirostris*	Hooked-Bill Vanga
Nesillas typica	Malagasy Brush Warbler	*Puffinus pacificus*	Wedge-tailed Shearwater	*Zoonevena grandidieri*	Madagascar Spinetailed Swift
Nettapus auritus	African Pygmy goose	*Rostratula benghalensis*	Greater painted-snipe	*Zosterops maderaspatanus*	Malagasy White-Eye
Newtonia brunnecauda	Common Newtonia	*Saraglossa auratus*	Madagasgar Starling		

Inventaires par Rado Rasolofoson et Tahiana R. Msc Biologie


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EXTRAORDINARY

Reptiles & Amphibians

GECKOS LIKE PRECIOUS STONES & FURTIVE CHAMELEONS

Anjajavy is home to an amazing diversity of lizards and other reptiles: the tropical climate and regular sunshine provide the perfect environment for about 40 species. Each tree seems to accommodate a gold-flecked gecko or a chameleon.

Will your favourite be the Madagascar Giant Day Gecko 1 *(Phelsuma madagascariensis)* with its shiny black eyes and its dazzling green body splashed with red? Or perhaps you will prefer the strange-looking Spearpoint Leaf-tailed Gecko 2 *(Uroplatus ebenaui)* which seems to come straight out of a fairytale.

Chameleons – for which Madagascar is a famous homeland – are represented by five species, the largest one 3 *(Furcifer oustaleti)*, the most colourful one *(Furcifer pardalis)* and smaller ones 4 *(Brookesia sp.)*.

Do snakes make you nervous? In Madagascar and in Anjajavy in particular, **you can watch snakes without any apprehension, as all species are completely harmless to humans**. Snake lovers must keep their eyes open for the strange-looking Malagasy Leaf-nosed Snake 5 *(Langaha sp.)*, the magnificent black or blond Madagascar Hog-nosed Snake 6 *(Leioheterodon madagascariensis, Leioheterodon modestus)* or the large Madagascan Ground Boa 7 *(Acrantophis madagascariensis)* of which Anjajavy had the honor to have the largest specimen ever recorded in the entire history of Madagascar, Big George measured more than 2.70 meters and weighed 8.3 kilograms.

Turtles 8 *(Eretmochelys imbricata, Chelonias mydas, Lepidochelys olivacea, Caretta caretta)* come and lay their eggs on a regular basis on the beaches of the peninsula, and hatchings are memorable moments.


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REPTILES
Listed in Anjajavy

Sanzinia madagascariensis	Madagascar Tree Boa
Acrantophis madagascariensis	Madagascar Ground Boa
Madagascarophis colubrinus	Malagasy Cat-Eyed Snake
Stenophis variabilis	Variable Tree Snake
Leioheterodon madagascariensis	Malagasy Giant Hognose Snake
Leioheterodon modestus	Blond Hognose Snake
Langaha madagascariesis	Malagasy Leaf-Nosed Snake
Langaha pseudoalluaudi	Malagasy Zebra Leaf-Nosed Snake
Ithycyphus perineti	Perinet's Night Snake
Liophidium torquatum	White-lipped Smooth Snake
Dromicodryas bernieri	Bernier's Striped Snake
Dromicodryas quadrilineatus	Four-Striped Snake
Mimophis mahafalensis	Common Big-Eyed Snake
Heteroliodon occipitalis	Light-Banded Dwarf Snake
Heteroliodon fohy	Stout Dwarf Snake
Uroplatus ebenaui	Spearpoint Leaf-Tail Gecko
Lygodactylus madagascariensis	Madagascar Dwarf Gecko
Lygodactylus tolampyae	Grandidier's Dwarf Gecko
Phelsuma madagascariensis	Madagascar Day Gecko
Phelsuma laticauda angularis	Gold Dust Day Gecko
Phelsuma mutabilis	Thick Tail Gecko
Erymnochelys madagascariensis	Madagascar Big-Headed Turtle
Pelusios castaneus	West African Mud Turtle
Furcifer oustaleti	Malagasy Giant Chameleon
Furcifer pardalis	Panther Chameleon
Furcifer angeli	Angel's Chameleon
Brookesia ambreensis	Amber Mountain Leaf Chameleon
Brookesia stumpffi	Plated Leaf Chameleon
Oplurus cuvieri	Collared Iguanid Lizard
Zonosaurus laticaudatus	Broad-Tailed Girdled Lizard
Trachylepis elegans	Elegant Mabuya Lizard
Trachylepis gravenhorstii	Gavenhorst's Mabuya
Trachylepis sp.	Karasburg tree skink
Geckolepis maculata	Golden Fish Scaled Gecko
Hemidactylus frenatus	Common House Gecko
Hemidactylus mercatorius	Farquhar Half-Toed Gecko
Hermidactylus platycephalus	Flathead Leaf-Toed Gecko
Paroedura oviceps	Nosybe Ground Gecko
Paroedura homalorhina	Northern Madagascar Ground Gecko
Paroedura vazimba	Vazimba Gecko
Paroedura stumpffi	Stumpff's Ground Gecko
Blaesodactylus sakalava	Giant Madagascan Velvet Gecko
Blaesodactylus antogilensis	Antongil Velvet Gecko
Scaphiophryne sp.	Anjajavy Scaphiophryne
Chelonia mydas	Green Sea Turtle
Caretta caretta	Loggerhead Sea Turtle

Madagascan Big-Headed Turtle

CRITICALLY ENDANGERED

This species of freshwater turtle *(Erymnochelys madagascariensis)* enjoys the lakes and streams of the Malagasy North-West coast. Its habitat is in great danger of destruction in favor of rice cultivation. The species is also threatened by collecting for the markets of traditional Asian pharmacopeia.

It is the focus of numerous conservation programmes. Anjajavy le Lodge is pursuing a **project of conservation** of this turtle through monitoring of reproduction sites and through community awareness-raising campaigns.

AMPHIBIANS
Listed in Anjajavy

NOM DE L'ESPÈCE	NOM COMMUN	NOM DE L'ESPÈCE	NOM COMMUN
Boophis tephraeomytax	Dumeril's Bright-Eyed Frog	*Hoplobatrachus tigerinus*	Asian Bull Frog
Laliostomalabrosum	Madagascar Bull Frog	*Heterilaxus luteostriatus*	Luteostriatus Small Frog
Aglytodactylus securifer	Madagascar Jumping Frog	*Dyscophus insularis*	Antsouhi Tomato Frog
Mantella ebenaui	Brown Mantilla Frog	*Rhombophryne gimmeli*	Benanovy Stump-Toed Frog
Gephyromantis pseudoasper	Mass Madagascar Frog	*Scaphiophryne sp.*	Scaphiophryne Frog
Spinomantis massi	Spinomantis Massi	*Ptychadena madagascareniensis*	Mascarene Grass Frog

A JUVENILE FEMALE RUNNING ON THE BEACH

12 SPECIES OF MAMMALS PRESENT IN THE ANJAJAVY FOREST

Listed in Anjajavy *(Excluding Lemurs)*

NAME OF THE SPECIES	COMMON NAME	NAME OF THE SPECIES	COMMON NAME
Potamochoerus larvatus	Bushpig	*Cryptoprocta ferox*	Fossa
Hipposideros commersonii	Commerson's Leaf-Nosed Bat	*Paremballonura tiavato*	Western Sheath-Tailed Bat
Fossa fossana	Fanaloka Malagasy Civet	*Tenrec ecaudatus*	Tailless Tenrec
Scotiphilus marovaza	Marovaza House Bat	*Setifer setosus*	Greater Hedgehog Tenrec
Eidolon dupreanum	Madagascan Fruit Bat	*Macrotarsomys bastardi*	Bastard Big-Footed Mouse
Pteropus rufus	Madagascan Flying Fox	*Felis silvestris*	Wild Cat

The Fossa

NOT ONLY A CHICKEN THIEF

The largest mammal of Madagascar is endemic to the island. Even though it looks similar to a puma, it is actually more closely related to the mongoose and civet. Very comfortable in trees, its long tail helps the animal to balance itself on the branches and its very flexible legs allow it to go down tree trunks head down.

The main predator of the lemurs, **this mammal is essential to the health of the lemur population** as it kills the sick or weakest. Its territory is between 1,300 and 2,600 hectares in size. The Fossa is vulnerable to extinction. As a chicken and cattle hunter, it is seldom welcome around homes.

We feel privileged that a female Fossa chooses one of the highest trees in the Private Reserve during its annual oestrus at the end of November. The males of the region then gather in honour of the event. It is on this occasion that the **Fossa Festival of Anjajavy takes place in order to raise awareness amongst the residents of the Protected Area for the protection of these animals** who do, in fact, cause some economic damage in the villages. A compensation fund was created to help villagers adapt *(for ex. special henhouses)* to the presence of these animals which attract the eco-tourists.

VULNERABLE TO EXTINCTION

A CENTRE FOR NATURE CONSERVATION & INTERPRETATION

A Centre for Nature Conservation & Interpretation

The Protected Area of Anjajavy have an exceptional natural diversity. **The goal of the centre is to protect nature, enhance it, use it in a sustainable manner, understand it and promote its assets and appeal to the residents of the Protected Area and to its visitors**. The centre, based at the Lodge, aims to become independent as revenues flow in. Revenues today are generated by donations and tourist participation in sightseeing tours in the Protected Area of Anjajavy.

Currently based at the Lodge, **the centre employs and trains guides, forest rangers and trackers for fire prevention, anti-poaching approaches, environmental awareness, and to combat illegal forest logging.**

Anjajavy le Lodge welcomes national and international students and researchers with a vested interest in the biodiversity of the Protected Area of Anjajavy. Students usually study ecology, biology, zoology, botany or geomatics. The positions are sought-after. This is the fifth consecutive year that the Lodge has received students from Cambridge University coming to study the lemurs, the first ambassadors of the Protected Area.

The visitors to Anjajavy le Lodge widely contribute to the protection of the Protected Area through their visit. They also participate directly in the permanent biological inventories of the Reserve by recording their animal or plant observations *(photos, exact location, phonology/ behaviours…)* on websites dedicated to specialised naturalistic observations *(inaturalist.org)*. **This involvement of visitors in the biological inventories has a positive effect by promoting stronger future eco-touristic behaviours and activities** like nature walks, discussions, participation in scientific research, and observation of interesting plants and animals. Bird watching, with its collection of bird species observed in nature, is a good example of this type of recreational activity of scientific importance.

SUSTAINED

Reforestation Efforts

A SUSTAINED ACTION, RESPECTFUL OF BIODIVERSITY

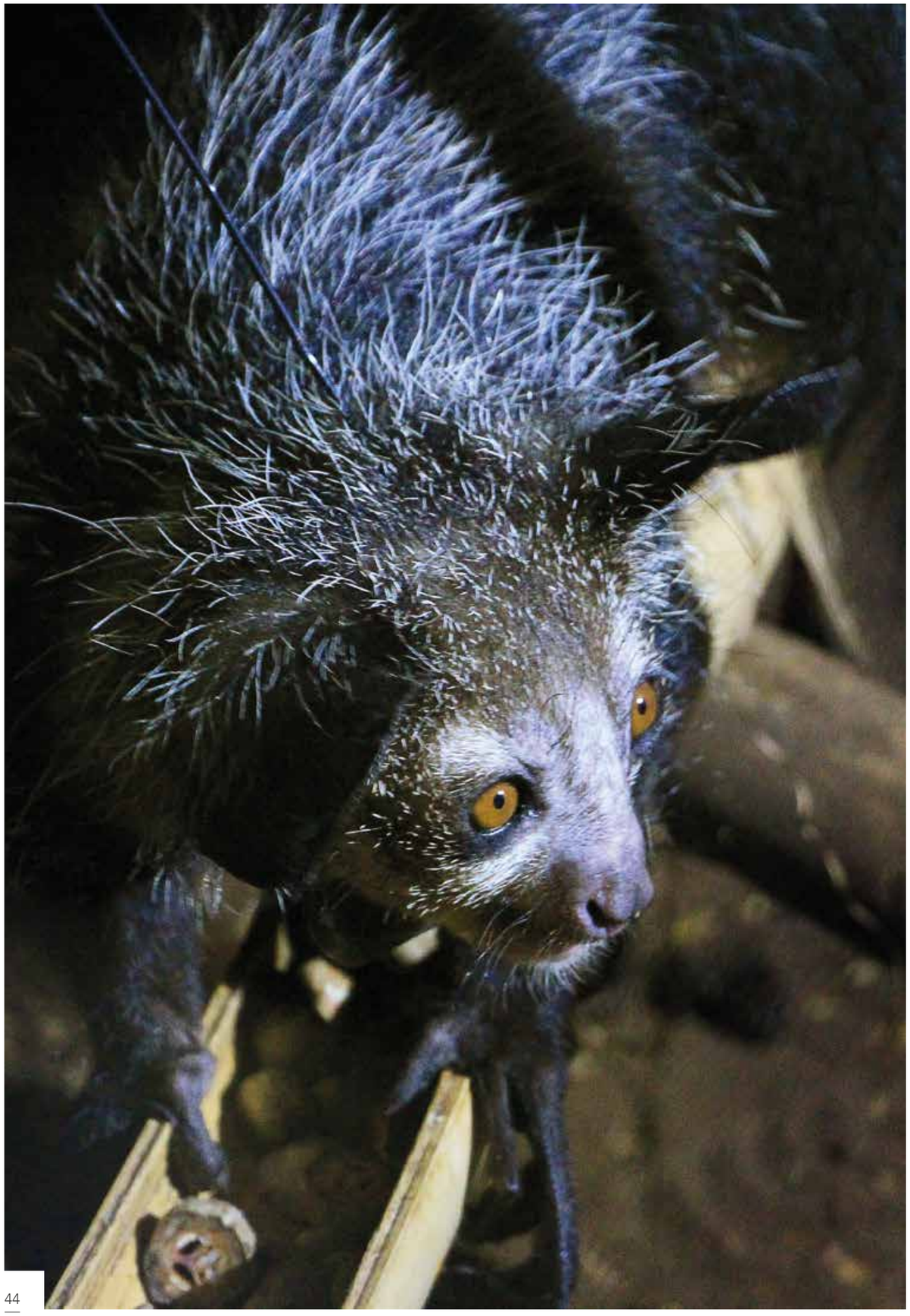
Since 2009, the Lodge has restocked the derelict areas around and inside the Anjajavy Protected Area by **planting 350,000 trees** of non-invasive indigenous or pan-tropical species. Survival rates *(35% in 2014)* improve from year to year. Some trees are surrounded by fences to protect against zebu and goats and are watered all year round in order to enable them to endure the eight month dry season.

Nurseries are carefully maintained around the Lodge. **Varieties are chosen according to the soil and the reforestation objectives**. Parasol trees, *Terminalias* have therefore been chosen for plains and savannahs intended for pasture. Moringa trees near villages have been used for their ability to adapt to the climate, the exceptional nutritional properties in the leaves enjoyed by the villagers on days of no fishing, and the possibility for using the seeds as a natural flocculent to clear drinking water. Orchards like mango and lemon trees as well as cashew trees will help create farm revenue whilst enriching the buffer area around the Reserve and avoiding deliberate fires. Ebony and rosewood are well positioned to serve as an exploitation place of precious wood in 50 years. Baobab trees, which are fairly resistant to fires and drought, are planted around firebreaks. Different types of mangroves are planted on salt ground and close to the sea where they will act as a natural barrier against erosion, salty sea winds and the rising floodwater, and will bring their evapotranspiration to the forest ecosystems of the region. Guests are encouraged to adopt trees.

SPECIES OF MANGROVES
Listed in Anjajavy

SPECIES NAME	COMMON NAME	SPECIES NAME	COMMON NAME
Avicennia marina	Grey Mangrove	*Rhizophora mucronata*	Loop-Root Mangrove
Bruguiera gymnorrhiza	Black Mangrove	*Sonneratia alba*	Mangrove Apple
Calophyllum inophyllum	Beach Calophyllum	*Xylocarpus granatum*	Cedar Mangrove
Ceriops tagal	Yellow Mangrove	*Xylocarpus rumphii*	Xylocarpus Rumphii
*Salvadora augustifolia**	Narrow-Leaved Mustard-Tree	*Thespesia populnea*	Portia Rree
Heritiera littoralis	Looking Glass Mangrove	*Pemphis acidula*	Pemphis
Lumnitzera racemosa	White-Flowered Mangrove		

** Species from which Anjajavy was named*



The Aye-aye

A PARIAH ANIMAL, WELCOME IN ANJAJAVY

The Aye-aye *(Daubentonia madagascariensis)* is an animal unlike any other, the only representative of its genus, the Daubentoniidae, he is considered as the most intelligent lemur but also as the biggest nocturnal primate in the world *(90 centimeters long including a 45 centimeter-tail included, weighing 2.5 kilograms)*. Borrowing many features of rodents, this lemur has continuously growing protruding incisors. Its two large ears use echolocation to locate insect larvae in the wood of trees and it uses its very long, thin middle fingers to extract them. Strange-looking with its white face, yellow eyes and skeletal fingers, this nocturnal animal is being hunted everywhere on the big island, **a victim of superstitious beliefs** and a reputation as a coconut thief. The region of Antonibe – a rural commune comprising Anjajavy – is no different. This animal has thus disappeared from the large Anjajavy forest where elderly people still remember seeing it regularly when they were children. Even though the species has the largest area of natural habitat of all lemurs, it is **in danger of becoming extinct.**

In order to protect the species, a research program with the Veterinary Department of the University of Antananarivo and a research center in Omaha *(USA)* has been initiated in 2015 and has led in 2018 to a reintroduction project of a female Aye-Aye *(Soalina)* and her daughter *(Kintana) within Anjajavy Protected Area. One of the main stage of this project was the sensibilization and education of residents on the importance of the conservation of the species.*

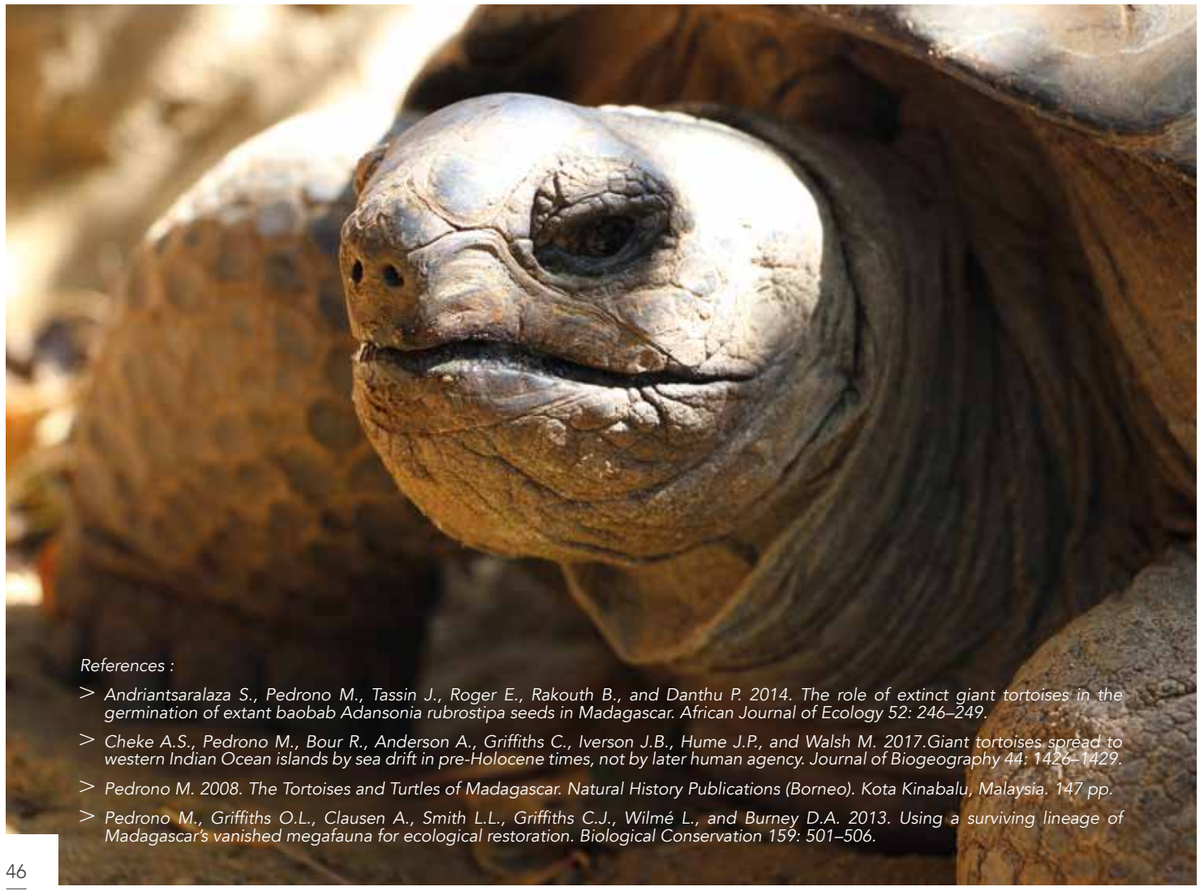
Following a quarantine period of several weeks to facilitate their adaptation to their environment, the release took place on October 19th 2018 in the presence of the representatives of the Ministry of Environment, Ecology & Forest region SOFIA and the local authorities.

They are now closely monitored to study their re-adaptation in their new habitat by a team of trackers and biologists using a VSH collar placed on the adult female.

The giant tortoises come back
TO MADAGASCAR

Madagascar lost its entire biological community of large vertebrates 500 to 1,300 years ago because of overexploitation by the first humans who colonized the island. Only small and medium-sized species of terrestrial vertebrates remain in Madagascar today, all of them weighing less than 20 kg. **Two species of giant tortoises used to roam the island, *Aldabrachelys grandidieri* and *Aldabrachelys gigantea***, both of which weighed more than 100kg. They occurred in hyper abundant populations before the first humans arrived and overexploited them.

The loss of these large herbivores continues to have serious consequences for the conservation of ecosystems in which they lived. **They played an essential ecological role as ecosystem engineers**, including nutrient cycling and large seed dispersal. One such example relates to baobab trees. Baobab seeds experience much greater germination success once they have passed through the gut of giant tortoises and currently, baobab trees are suffering poor reproductive rates due to lack of extant seed dispersal species. A second example relates to bushfires which remain a major threat to Madagascan biodiversity. Enhanced bushfire frequency is a reported consequence of the demise of large herbivores in Madagascar *(including giant tortoises)*, as a result of increases in flammable plant biomass due to reduced grazing.



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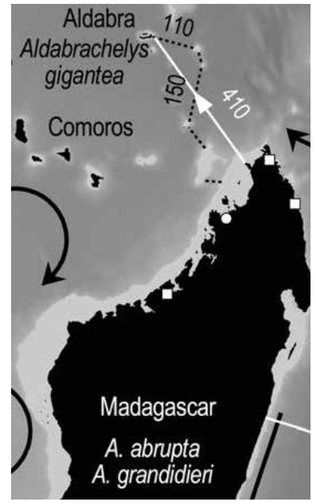
VESTIGE OF A DISAPPEARED MEGAFAUNA

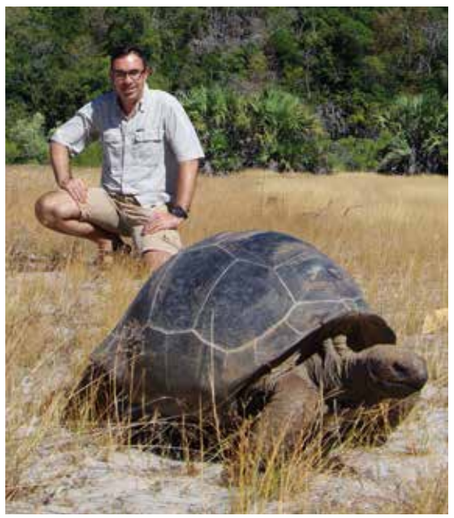
The giant tortoise *Aldabrachelys gigantea* is the only species of the entire Madagascan megafauna that survives to this day. It is found on the Aldabra Atoll located only 400 kms north of Madagascar. The Atoll has been colonized by individual tortoises that have drifted across the ocean from Madagascar, and is now the home of a large population of giant tortoises. The oceanic dispersion of giant tortoises is well documented and their large size, comprising significant fat deposits, is an important asset in surviving food and freshwater deprivation during long periods of ocean drift. As insufficient time has passed since the colonization of the Aldabra Atoll for speciation to have occurred between the Aldabran population and the founding Madagascan population, the giant tortoises found on the Atoll are the last individuals of Madagascar's giant tortoises. **It is therefore crucial to seize the unique opportunity that exists to reintroduce this species belonging to the Madagascan megafauna, and thus rewild certain ecosystems and improve their resilience.**



http://sciencythoughts.blogspot.com/2017/02/understanding-origins-of-giant.html?m=1

A UNIQUE PROJECT

We are delighted that the Anjajavy Protected Area has been selected by Dr Miguel Pedrono, the Madagascan tortoise expert, and the Madagascan Government to conduct the very **first reintroduction of giant tortoises in Madagascar.** The long-term goal of this **innovative project** is to develop a rewilding program in Anjajavy based on the establishment of a large viable population of giant tortoises. In June 2018, 12 giant tortoises fitted with transponders were moved to Anjajavy where they are living in a large enclosed natural savanna. It is the first time in over 500 years that this extraordinary species has returned to the wild in Madagascar. Anjajavy is now the only place where it is possible to observe giant tortoises in their natural Madagascan surroundings. These precious individuals have a strong potential to become the first successful breeding population of giant tortoises in Madagascar since the local extinction of this species and, as such, Anjajavy has the attention of conservation biologists around the world. This is the very first opportunity to study the ecology of a Madagascan megafauna species in real time, and no longer indirectly through their subfossil remains and it is hoped that some previously unknown ecological functions provided by these species in Madagascar may eventually be discovered.



NEIGHBORING VILLAGES

A Fraternal Relationship

ORGANISING ITSELF FOR THE FUTURE

Since its creation, Anjajavy le Lodge has been financing voluntary entrepreneurship for boat transport, traditional fishing, apiculture and vegetable growing through **micro credits**. Since 2009, Anjajavy le Lodge and its clients have collaborated in the **construction of a market, security post and a secondary school**. The clinic of the Lodge also provides medico-technical support to midwives as well as **emergency medical services** for the four neighboring villages with a population of more than **5,000 people in total**.

In 2016 and 2017, the Lodge and its clients are financing the construction of **public washrooms** and a **college library**. Since 2016, with the approval of the authorities, the clinic of the Lodge provides an **antimalarial prophylaxis** for all the villages in the Protected Area.

With the signature of the Protected Area, an eco-tax system has been put in place on the tourist activities of Anjajavy Lodge. This eco-tax finances larger projects for the benefit of all residents of the Protected Area and for the protection of biodiversity.

These projects are not unilaterally decided upon, rather they are discussed at length by the elected representatives of the villages in order to address genuine needs and optimise budgets.

This **way Anjajavy le Lodge works hand in hand with the representatives and the elected officials of the neighbouring villages** *(Mayor of the town of Antonibe, municipal counsellors, Presidents of Fokontany – Malagasy villages - of Anjajavy, of Antsangabe and Amboaboaka)* as well as with the traditional chiefs and traditional village councils *(Elder Councils, Youth Councils, Women's Association)* with the help of NGOs.

It is in the context of discussions about the allocation of donation budgets, organisation of cultural events and concomitantly with the creation of the Protected Area of Anjajavy, that the Council of the large Anjajavy Reserve was established. The meetings of this entity are being formalised in the form of meeting minutes and assembly reports.

VILLAGES OF THE PROTECTED AREA OF ANJAJAVY

NAME	POPULATION	MAIN ACTIVITIES	MAIN INFRASTRUCTURES
ANJAJAVY	1 800	Tourism (40%) Traditional fishing (30%) Agriculture and livestock (20%) Boat transport (10%)	Well, preschool, primary school, secondary school, solar charging stations, markets, toilets, guard posts, embroidery workshops, sculpture workshops, health centres, clinics, midwife
ANTSANGABE	1 300	Agriculture and livestock (75%) Wood (15%) Cart transport (10%)	Well, primary school, small market, public toilets, guard post, clinic, midwife
AMBOABOAKA	1 200	Agriculture and livestock (70%) Wood (20%) Cart transport (10%)	Well, primary school, small market, public toilets
AMBONDRO AMPASY	800	Fishing (40%) Tourism (30%) Transport (20%) Agriculture (10%)	Well, primary school, small market, toilets, embroidery workshops, health centre
TOTAL	5 100	*Ref. : Recensement 2014 et estimations économiques Fokontany d'Anjajavy*	*French NGO Ecoles du Monde realized most of the infrastructures before 2009*

Events

CALENDAR

2000

/// Creation by Dominique Prat of Anjajavy l'Hôtel on a 150 Ha peninsula with no fresh water ressources.

/// Traditional right of protection given to the hotel by Anjajavy village over a 400 m marine area in front of the 3,5 kms coast line of the peninsula.

2004

/// Anjajavy l'Hôtel becomes a Relais & Châteaux member.

/// An accidental fire near the hotel burned 65 hectares of forest.

/// Creation of the Anjajavy l'Hôtel fire brigade.

/// Creation of two firebreaks between tsingy walls and mangrove areas.

2005

/// Anjajavy l'Hôtel is awarded with the **Relais & Châteaux Environnemental Trophy.**

2007

/// Cyclone.

2010

/// Change of ownership of Anjajavy l'Hôtel. Rajabali family acquires the hotel.

/// Acquisition of two Cessna Caravans of the hotel by MTA.

/// **Anjajavy l'Hôtel Staff becomes 100 % Malagasy.**

2012

/// Renovation of the Anjajavy market building by Anjajavy l'Hôtel.

2013

/// Signature of a 50 year lease for Private Reserve with DREEF on 450 hectares of forest.

/// Building of Anjajavy post-guard by Anjajavy l'Hôtel.

2014

/// « Anjajavy l'hôtel » becomes « Anjajavy le Lodge ».

2015

JUNE - SEPTEMBER

/// Three month internship at Anjajavy le Lodge of Thomas James Grove, an undergraduate student from Cambridge University on the subject of Sifaka behaviour.

SEPTEMBER

/// Inauguration of the **Anjajavy Secondary School, built by Anjajavy le Lodge** and with the help of donations by its clients, including M. Clay Dial.

OCTOBER

/// Acquisition for the Private Reserve of Anjajavy le Lodge of a 190 hectares piece of land, bordering the mangrove north of the Reserve including a harbor, tsingy towers and a site of anthropological interest.

NOVEMBER

/// **Illegal slaughter of a male Fossa** (*Cryptoprocta ferox*) **by poachers** during annual breeding season on the outskirts of the Reserve. Poachers caught, confessed and were banned from the village of Anjajavy.

DECEMBER

/// First **compensation payments** to villagers suffering damages to livestock *(chickens, goats, cattle)* caused by the Fossa predation.

/// Procurement of a permit from the National Water and Forestry Department *(DREEF)* for the relocation of two radio-collared Aye-ayes in the greater Anjajavy forest for the purpose of their study and reintroduction.

/// Recruitment and initial training of four **forest rangers for the supervision of protected areas of Anjajavy.**

/// **First Nature Festival of Anjajavy**, held on the 19th of December. The population demonstrates its motivation to protect the nature of Anjajavy and its region under the patronage of the mayor of the town of Antonibe. First meeting in Anjajavy le Lodge of a **council of preserved natural areas of Anjajavy** with leaders and authorities from local villages of the greater Anjajavy Reserve in view of creating and formalising protected areas of Anjajavy.

2016

JANUARY

/// Team building walk by all the staff of the Anjajavy le Lodge, from north to south of the greater Anjajavy forest. Seed planting, anti-fire, anti-felling and anti-poaching signages installed in the eastern side of the new protected area.

/// Second committee meeting of leaders and authorities from local villagers of the great Anjajavy forest protected areas and establishment of zoning regulations

/// Start of the educational tours of the Lodge by students and teachers of Anjajavy to help in educating on the concepts of natural heritage, biodiversity and sustainable use of resources.

JANUARY - MARCH

/// **Intensive reforestation of nursery trees** in and around the great Anjajavy forest. Full-time employment of seven foresters during a three-month period.

/// **Six month internship of Alexis Busquet, a postgraduate student** for assistance in formalising the creation of protected Reserves and areas in Anjajavy.

APRIL

/// 5 April: **Discovery of an exceptional paleontological and speleological site** with the jaw of a dwarf hippopotamus south of the protected forest area of Anjajavy.

/// 10 April: **Training/orientation in ecotourism of four forest rangers** - for the monitoring of the protected areas of Anjajavy by the Vice President of the national association for guides in Madagascar.

/// 11 April: Traditional ceremony of Joro *(ritual sacrifice of a zebu)* in order to seal a deal on the rules on the new Private Reserve of Anjajavy le Lodge. Confirmation of the zoning regulations of the area.

/// 18 April: **Council meeting of the protected areas of Anjajavy** for the sustainable touristic development of the Ambohimenamaso cave to benefit the fund for the new protected areas of Anjajavy.

MAY

/// Distribution of Anti-malaria Prophylaxis held by Anjajavy le Lodge *(on the request of Antonibe officials)* for 2,500 people around the Reserve in the villages of Antsangabe, Antanimbaribe, Amboaboaka and Ambondro Ampasy.

JULY

/// 3 month internship of Benjamin Walton, an undergraduate student from Cambridge University : on the subject of calls of diurnal lemurs in Anjajavy.

AUGUST

/// 4 day mission in Anjajavy le Lodge of **WWF Country Manager**, Mrs RATSIFANDRIHAMANANA Anitry Ny Aina and Dr Rémi RATSIMBAZAFY *(WWF Marine conservation expert)*

/// Because of the negative impact on the coastal traditional fishing, **communities of Ambondro Ampasy and Kinga are willing to have no more fishing nets in the Mangrove** *(Start of active prohibition of fishing nets in mangrove arms).*

SEPTEMBER

/// **Visit of a research team from Kew Gardens** led by Lauren Gardiner.

/// **Training of Anjajavy guides on the use of inaturalist.org platform** by Kew Garden researchers.

/// **Collection of botanical samples in Anjajavy Private Reserve** by Kew Garden researchers.

/// **Public consultation on the rules of the new protected area**. Consultations are held in Antsangabe, Amboaboaka and in Anjajavy village. The Anjajavy villages meeting is held with the mayor of Antonibe.

/// **Activities with Anjajavy children** on the benefits of protecting the Anjajavy environment.

/// **Exhibition on the benefits of Environmental conservation** in Anjajavy village and in the new Anjajavy secondary school.

/// An extended fire *(2,000 hectares)* occurs in the peninsula of Marovaza, 15 kms north of Anjajavy *(not in the Reserve)*. Charcoal exploitation identified by officials as the probable cause of the fire.

/// **Fire-fighting by Anjajavy le Lodge fire brigade to protect « La maison de Marovaza » and « Villa Caroline » guest houses** *(Duration: 20 hours).*

OCTOBER

/// Start of the **Wednesday talks** between the doctor and managers of Anjajavy le Lodge and the students of Anjajavy secondary school *(subjects discussed : contraception, hygiene, village cleaning, sanitation, nature conservation…).*

/// **1,000 books bought for the Anjajavy secondary school library, by the Anjajavy donation fund**, including M. Matt Fries for Emmaüs Foundation (US) and Mrs K. Pooley for Garden House (UK).

NOVEMBER

/// 4 days seminar in St-Marie island for three staff of Anjajavy le Lodge and the president of Fokontany of Anjajavy on sustainable marine practices with MIHARY association.

/// 20 days mission undertaken by two WWF technicians to implement rules and regulations in the great Reserve of Anjajavy.

2017

JANUARY - MARCH

/// **Intensive reforestation of nursery trees** in and around the greater Anjajavy forest. Full-time employment of seven foresters during a three-month period.

/// 2nd edition of the Nature Festival with Fossa as the main theme.

MAY

/// Meeting of the SAPM Commission *(System of Protected Areas of Madagascar)* for the temporary protection of the Anjajavy site.

JUNE

/// Meeting of the SAPM Commission *(System of Protected Areas of Madagascar)* on the ruling draft for the temporary protection of the Protected Area of Anjajavy.

JULY

/// Enforcement of the inteministerial ruling for the temporary protection of the protected area under creation named «ANJAJAVY», District of Analalava, SOFIA region.

OCTOBER

/// 13 days mission undertaken by two ARTELIA Cabinet technicians to perform an Environmental and Social Impact Study within the framework of the creation of the Anjajavy Protected Area.

NOVEMBER

/// 2 days mission undertaken by two technicians from the National Office of the Environment and a Technician from Cabinet ARTELIA to carry out the environmental assessment for the creation of the New Protected Area of Anajajy.

DECEMBER

/// 10 days mission undertaken by the teams of the Regional Directorate for the Environment, Ecology and Forests and the Regional Direction of the Topography to complete the final demarcation of the new Anjajavy Protected Area and confirm its development and management plan.

2018

FEBRUARY – MARCH

/// The team of Anjajavy le Lodge attend several training workshops given by the WWF on the management software in conservation MIRADI.

MARCH

/// 13 March : Regional Validation of its Development and Management Plan of the New Anjajavy Protected Area in Antsohihy.

/// 27 March : Meeting organised by the Protected Areas System of Madagascar Commission on the Development and Management Plan and the draft decree of the New Anjajavy Protected Area.

APRIL

/// **Decree No. 2018-367 of April 17, 2018 brings into effect the definitive creation of the New Protected Area called «ANJAJAVY», District of Analalava, SOFIA Region.**

JUNE

/// Arrival of 12 Giant Tortoises of Madagascar in the Protected Area of Anjajavy and start of the reintroduction program in collaboration with the specialist Miguel Pedrono.

OCTOBER

/// Reintroduction of a female Aye-aye and her daughter into the Protected Area after a quarantine period.

DECEMBER

/// Distribution of 860 school kits at the beginning of the school year for all resident students in the Protected Area.

/// Reforestation day of the mangrove accompanied by the students of the college of Anjajavy village.

APPENDICES

REPOBLIKAN'I MADAGASIKARA
Fitiavana - Tanindrazana - Fandrosoana

MINISTERE DE L'ENVIRONNEMENT, DE L'ECOLOGIE, ET DES FORETS

DECRET N°2018-367
PORTANT CREATION DEFINITIVE DE LA NOUVELLE AIRE PROTEGEE DENOMMEE
« ANJAJAVY »
COMMUNE RURALE . ANTONIBE
DISTRICT: ANALALAVA
REGION: SOFIA

LE PREMIER MINISTRE, CHEF DU GOUVERNEMENT,

- Vu la Constitution ;
- Vu la Loi organique n°2014-018 du 14 août 2014 régissant les compétences, les modalités d'organisation et de fonctionnement des Collectivités Territoriales Décentralisées, ainsi que celles de la gestion de leurs propres affaires, complétée par la loi organique n° 2016-030 du 23 août 2016 ;
- Vu la Loi n°70-004 du 23 juin 1970 portant ratification de la Convention Africaine sur la Conservation de la Nature et des Ressources Naturelles,
- Vu la Loi n°95-013 du 09 août 1995 autorisant la ratification de la Convention sur la Diversité Biologique,
- Vu la Loi n°95-017 du 25 août 1995 portant code du Tourisme ;
- Vu la Loi n°96-018 du 04 septembre 1996 portant Code Pétrolier ;
- Vu la Loi n°96-025 du 30 septembre 1996 relative à la Gestion Locale des Ressources Naturelles Renouvelables,
- Vu la Loi n°97-017 du 08 août 1997 portant révision de la Législation Forestière,
- Vu la Loi n°99-022 du 19 août 1999 portant Code Minier modifié par la loi n°2005-021 du 17 octobre 2005 portant modification de certaines dispositions portant sur le code minier ;
- Vu la Loi n°2001-004 du 25 octobre 2001 portant réglementation générale des Dina en matière de sécurité publique ;
- Vu la loi n°2005-019 du 17 octobre 2005 fixant les principes régissant les statuts des terres,
- Vu la Loi n°2006-031 du 24 novembre 2006 fixant le régime juridique de la propriété foncière privée non titrée ;
- Vu la Loi n°2008-013 du 23 juillet 2008 relative au Domaine Public ;
- Vu la Loi n°2008-014 du 23 juillet 2008 sur le domaine privé de l'Etat, des Collectivités décentralisées et des personnes morales de droit public ;
- Vu la loi n° 2014-020 du 27 septembre 2014 relative aux ressources des Collectivités territoriales décentralisées, aux modalités d'élections, ainsi qu'à l'organisation, au fonctionnement et aux attributions de leurs organes
- Vu la loi n° 2014-021 du 12 septembre 2014 relative à la représentation de l'Etat ;
- Vu la Loi n°2015-003 du 19 février 2015 portant Charte de l'Environnement Malagasy actualisée ;
- Vu la Loi n°2015-005 du 26 février 2015 portant refonte du Code de gestion des Aires Protégées ;
- Vu l'Ordonnance n°60-146 du 03 octobre 1960 relative au régime foncier de l'immatriculation et ses textes subséquents d'application ;
  Vu le Décret n°94-112 du 18 février 1994 portant organisation générale des activités de la pêche maritime ;

Vu le Décret n°97-1455 du 18 décembre 1997 portant organisation générale des activités de collecte des produits halieutiques d'origine marine ;
Vu le Décret n°99-954 du 15 décembre 1999 relatif à la mise en compatibilité des investissements avec l'environnement (MECIE) modifié par le décret n°2004-167 du 03 février 2004
Vu le Décret n°2000-170 du 20 février 2000 portant application du Code Minier ;
Vu le Décret 2001-122 du 14 février 2001 fixant les conditions de mises en œuvres de la gestion contractualisée des forêts de l'Etat ;
Vu le Décret 2005-849 du 13 décembre 2005 portant refonte des conditions générales d'applications de la loi 97-017 du 8 août 1997 portant révision de la législation forestière ;
Vu le Décret n°2006-910 du 19 décembre 2006 fixant les modalités d'application de la loi n°99-022 du 19 août 1999 portant Code minier modifié par la loi n°2005-021 du 17 octobre 2005 ;
Vu le Décret n° 2014–1929 du 23 décembre 2014 fixant les modalités d'application de certaines dispositions de la loi n° 2014–021 du 12 septembre 2014 relative à la représentation de l'Etat ;
Vu le Décret n° 2015–960 du 16 juin 2015 fixant les attributions du chef de l'exécutif des Collectivités territoriales décentralisées ;
Vu le Décret n°2016-250 du 10 avril 2016 portant nomination du Premier Ministre, Chef du Gouvernement;
Vu le Décret n°2016 – 265 du 15 avril 2016, modifié et complété par les décrets n°2016-460 du 11 mai 2016, n°2016-1147 du 22 août 2016 et n°2017 -148 du 02 mars 2017, n°2017-262 du 20 avril 2017 et n°2017-590 du 17 juillet 2017, et n°2017-724 du 25 août 2017, et n°2017-953 du 12 octobre 2017 portant nomination du gouvernement
Vu le Décret n°2016-298 du 26 avril 2016 fixant les attributions du Ministre de l'Environnement, de l'Ecologie et des Forêts ainsi que l'organisation générale de son Ministère ;
Vu le Décret n°2017-376 du 16 mai 2017 portant adoption de la politique forestière nationale actualisée ;
Vu le Décret n°2017-415 du 30 Mai 2017 fixant les modalités et les conditions d'application de la loi n°2015-005 du 26 février 2015 portant refonte du Code de Gestion des Aires Protégées ;
Sur proposition du Ministre de l'Environnement, de l'Ecologie et des Forêts ;
En Conseil de Gouvernement,

DECRETE :

TITRE I : DE LA CREATION ET DELIMITATION DE L'AIRE PROTEGEE

Article premier :
Il est créé une Aire Protégée, dénommée « **Anjajavy** » de la catégorie « **Paysage Harmonieux Protégé** », équivalente de la catégorie V de l'UICN, située dans la Commune Rurale Antonibe, District Analalava, Région Sofia.
La liste des Fokontany et Commune concernées par l'aire protégée dénommée « **Anjajavy** » figure en annexe I du présent décret.
Le Paysage Harmonieux Protégé « **Anjajavy** » a une superficie totale de **neuf mille sept cent soixante-treize hectares (9 773 ha),** il fait partie du Système des Aires Protégées de Madagascar.

Article 2 :
La carte de localisation de l'aire protégée « **Anjajavy** » figure en annexe II du présent décret.
Les descriptifs des points limites de l'aire protégée assortis des coordonnées géo référencées établies selon les normes du service topographique décrivant l'aire protégée « **Anjajavy** » sont définis en annexe III du présent décret.

Le périmètre de l'aire protégée est classé terrain soumis à des régimes juridiques spécifiques conformément à la législation en vigueur.

Le Ministère chargé des Aires Protégées doit déclencher le processus de sécurisation foncière auprès de la Direction Générale des Services Fonciers, dès la publication au Journal Officiel du présent décret.

TITRE II : DE L'OBJECTIF DE GESTION DE L'AIRE PROTEGEE

Article 3 :
L'objectif principal de gestion poursuivis dans l'Aire Protégée « Anjajavy » est d'assurer, la préservation et le maintien de la biodiversité, la durabilité des fonctions écologiques et la maintenance de la productivité des écosystèmes nécessaires au bien-être des communautés riveraines ainsi que l'utilisation durable des ressources naturelles.
Les objectifs spécifiques de gestion sont de :

- Pérenniser, préserver l'intégrité de la biodiversité et les valeurs particulières du site ;
  Allier la conservation et l'économie locales ;
- Responsabiliser les acteurs locaux ;
  Contribuer au développement durable dans la région ;
  Développer un écotourisme d'Excellence.

TITRE III : DE L'ORGANISATION DE GESTION DE L'AIRE PROTEGEE

Article 4 :
La Direction Régionale de l'Environnement, de l'Ecologie et des Forêts et la Direction Régionale des Ressources Halieutiques et de la Pêche sont désignées co-gestionnaire de l'Aire Protégée « Anjajavy ». La gestion peut toutefois être confiée à une ou des personnes morales de droit public ou de droit privé sous le régime de la gestion déléguée par voie réglementaire laquelle détermine les termes de la délégation, les droits et obligations des parties.

Article 5 :

Le Comité d'Orientation et de Suivi (COS), assure le suivi de l'exécution des actions découlant du présent décret. Il est co-présidé par le Directeur Régional de l'Environnement, de l'Ecologie et des Forêts, le Directeur Régional des Ressources Halieutiques et de la Pêche ou leurs représentants et le ou les Préfet(s) territorialement compétents. Le COS comprend notamment les Représentants de la Région, ceux des Services déconcentrés des Ministères concernées, des collectivités territoriales décentralisées, du gestionnaire ou gestionnaire délégué de l'aire protégée « Anjajavy » et des représentants des communautés de base riveraines de l'aire protégée, ainsi que toute personne ou organisme choisi pour ses compétences particulières.

TITRE IV : DE LA GOUVERNANCE DE L'AIRE PROTEGEE

Article 6 :
Le mode de gouvernance qui s'applique à l'aire protégée est la gouvernance partagée de type collaboratif entre le gestionnaire ou le gestionnaire délégué et les communautés locales. Conformément au principe de gouvernance du Système des Aires Protégées de Madagascar tel que défini dans l'article 6 de la Loi n°2015-005 du 26 février 2015 portant refonte du Code de gestion des Aires Protégées, le gestionnaire ou le gestionnaire délégué doit, dans le cadre de gestion de l'aire protégée :

- S'assurer de la transparence et respecter le principe de responsabilité vis-à-vis des diverses parties prenantes et du public
- Respecter le principe de redevabilité

- Respecter le principe de partage équitable des avantages

TITRE V : DE L'AMENAGEMENT DE L'AIRE PROTEGEE

Article 7 :
L'Aire Protégée « Anjajavy » dispose d'un plan de zonage composé de :

- Deux (02) Noyaux durs d'une superficie totale d'environ 595 ha.

- D'une Zone tampon d'une superficie totale de 9 178 ha environ constituée de :
  - Zone d'occupation contrôlée : 45 ha
  - Zone de pâturage : 191 ha
  - Zone d'utilisation durable : 6 006 ha
  - Zone de prélèvement : 1 268 ha
  - Zone de conservation de mangroves : 1 000 ha
  - Zone de restauration initiale : 500 ha
  - Réserve marine : 168 ha

Compte tenu de l'existence des carrés miniers ayant obtenus des permis antérieurs localisés à l'intérieur de la zone tampon, il est déduit de la superficie totale de ladite zone 5 339 ha à titre de Zone affectée à d'autres activités spécialement autorisées. Toutefois, l'exercice des activités d'exploration et/ou d'exploitation par le permissionnaire doit respecter le principe de cohabitation et les règlementations y afférentes.
Une carte de zonage avec indications des coordonnées géo-référencées de l'Aire Protégée « Anjajavy » est donnée en annexe IV

TITRE VI : DE LA REGLE DE GESTION DE L'AIRE PROTEGEE

Article 8 :

Le Plan d'Aménagement et de Gestion précise les règles de gestion des différentes zones du paysage harmonieux protégé « **Anjajavy** », lesquelles doivent impliquer la population locale et comporte les mesures d'accompagnements nécessaires pour contribuer au développement socio-économique de la région.

Article 9 :

Outre les cas prévus par la Loi n° 2015-005 du 26 février 2015 portant refonte du Code de gestion des Aires Protégées et ses textes subséquents d'application, les activités suivantes sont **strictement interdites au niveau des noyaux durs** :
- Le défrichement,
  L'extension des périmètres de culture;
  Les feux de végétation ;
  Le prélèvement d'espèces végétales à des fins de commercialisation ;
  La chasse, la consommation et la vente d'animaux protégées ;
- et de manière générale tout acte de nature à apporter des perturbations à la faune et à la flore ainsi qu'à l'aspect original du milieu naturel.

Toutefois, outre les cas prévus par la Loi n° 2015-005 du 26 février 2015 portant refonte du Code de gestion des Aires Protégées et ses textes subséquents d'application sont notamment **autorisés et/ou réglementés au niveau de la zone tampon** :

- l'aquaculture familiale ou artisanale et le cas échéant tout type d'aquacultures ayant obtenu des autorisations industrielle et semi industrielle antérieures ;
- les activités minières et pétrolières découlant de permis ou contrat de reconnaissance antérieures ;
- les constructions immobilières ;
- les travaux d'aménagement en faveur du tourisme écologique ayant obtenu un permis d'implantation et un permis environnemental;
  les activités légales liées aux recherches scientifiques;

- les activités liées à la conservation : suivi écologique, restauration, contrôle et surveillance ;
l'utilisation piétonnière sur les principaux sentiers existants;
l'accès aux sites culturels par les sentiers y menant et la pratique des activités culturelles ;
les activités liées à la gestion et l'utilisation durable des ressources forestières et celles des zones humides ;
- la petite pêche et la pêche artisanale - sur certains sites prédéfinis - respectant d'une manière générale, les dispositions réglementaires applicables à la pêcherie :
  - matériels et engins de pêche réglementés et autorisés,
  - substances non toxiques,
  - interdiction d'utilisation d'explosifs et des procédés électriques sur le poisson, ou tout dispositif permettant une immersion plus longue que celle autorisée par la seule respiration naturelle,
  - interdiction de mode ou instrument de pêche prohibé, ou détention de cet instrument,
  - interdiction de pêche et/ou collecte dans les zones pendant les saisons et les heures où la pêche est interdite,
  - interdiction de pêche et/ou collecte des espèces dont la capture est prohibée, ou dont les dimensions sont inférieures à celles autorisées,
  - interdiction de pêche sans autorisation préalable ;
- la pêche récréative/sportive.

Article 10:

Les activités extractives ainsi que les activités de pêche industrielle et artisanale antérieures sont permises dans le respect des dispositions de la Loi n°2015-005 du 26 février 2015 portant refonte du Code de Gestion des Aires Protégées avec ses textes subséquents d'application, du Décret n°99-954 du 15 décembre 1999 relatif à la mise en compatibilité des investissements avec l'environnement (MECIE) modifié par le décret n°2004-167 du 03 février 2004 et des réglementations sectorielles y afférentes.

Article 11 :

La visite de l'Aire Protégée « Anjajavy » à des fins touristiques ou de recherches scientifiques est soumise selon le cas au paiement des droits d'entrée, des droits de recherche et des droits de prise de vue et filmage dont les modalités de perception sont fixées par voie réglementaire. La visite des circuits touristiques ouverts à cet effet est soumise au service de guidage respectant la législation en vigueur.

TITRE VII : DE LA REPRESSION DES INFRACTIONS COMMISES DANS L'AIRE PROTEGEE

Article 12:
Les infractions aux dispositions du présent décret sont constatées et punies conformément aux dispositions de l'article 55 à 79 de la Loi n°2015-005 du 26 février 2015 portant refonte du code de gestion des aires protégées et, en cas de silence, aux autres textes en vigueur.

TITRE VIII : DISPOSITIONS FINALES

Article 13 :
Les annexes citées dans le présent décret en font partie intégrante.

Article 14 :
En raison de l'urgence et conformément aux dispositions de l'article 4 de l'ordonnance n°62-041 du 19 septembre 1962 relative aux dispositions générales de droit interne et de droit international privé, le présent décret entre immédiatement en vigueur dès sa publication par voie radiodiffusée ou télévisée, indépendamment de son insertion au Journal Officiel de la République.

Article 15:

Le Ministre auprès de la Présidence chargé des Projets Présidentiels, de l'Aménagement du Territoire et de l'Equipement, Le Ministre auprès de la Présidence en charge de l'Agriculture et de l'Elevage, Le Ministre auprès de la Présidence chargé des Mines et du Pétrole, Le Garde de Sceaux, Ministre de la Justice, Le Ministre de l'Intérieur et de la Décentralisation , Le Ministre du Tourisme, le Ministre de l'Environnement, de l'Ecologie et des Forêts, le Ministre des Ressources Halieutiques et de la Pêche, le Ministre de la Culture, de la Promotion de l'Artisanat et de la Sauvegarde du Patrimoine, Le Secrétaire d'Etat auprès du ministère de la Défense Nationale chargé de la Gendarmerie nationale, Le Secrétaire d'Etat auprès du Ministère des Ressources Halieutiques et de la Pêche chargé de la Mer , sont chargés, chacun en ce qui le concerne, de l'exécution du présent décret qui sera publié au Journal Officiel de la République de Madagascar.

Fait à Antananarivo, le 17 avril 2018

Par Le Premier Ministre,
Chef du Gouvernement

MAHAFALY Solonandrasana Olivier

Le Ministre auprès de la Présidence chargé des Projets Présidentiels,
de l'Aménagement du Territoire et de l'Equipement

RAMANANTSOA Ramarcel Benjamina

Le Ministre auprès de la Présidence chargé de l'Agriculture et de l'Elevage

RANDRIARIMANANA Harison Edmond

Le Ministre auprès de la Présidence chargé des Mines et du Pétrole

ZAFILAHY Ying Vah

Garde de Sceaux, Ministre de la Justice

RASOLO Elise Alexandrine

Le Ministre de l'Intérieur et de la Décentralisation

MAHAFALY Solonandrasana Olivier

Le Ministre du Tourisme

RATSIRAKA Iarovana Roland

Le Ministre de l'Environnement, de l'Ecologie et des Forêts

NDAHIMANANJARA Bénédicte Johanita

Le Ministre des Ressources Halieutiques et de la Pêche

GILBERT François

Le Ministre de la Culture, de la Promotion de l'Artisanat et de la Sauvegarde du Patrimoine

RABENIRINA Jean Jacques

Le Secrétaire d'Etat auprès du ministère de la Défense Nationale chargé de la Gendarmerie nationale

RANDRIAMAHAVALISOA Razafindramaitso Girard

Le Secrétaire d'Etat auprès du Ministère des Ressources Halieutiques et de la Pêche chargé de la Mer

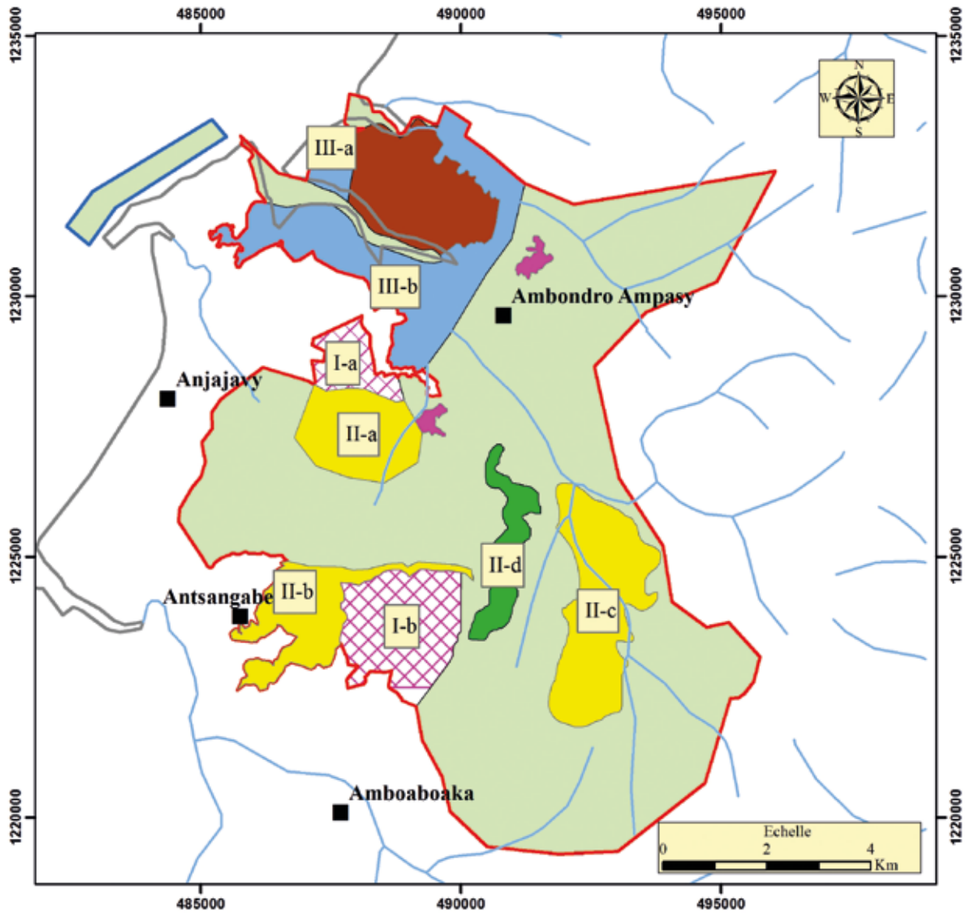
RANDRIANARISOA Léonide Ylénia

Pour ampliation conforme
Antananarivo, le 27 AVR 2018
Le Secrétaire Général du Gouvernement

FARATIANA Tsihoara Eugène

7

ZONING MAP OF THE ANJAJAVY PROTECTED AREA



LEGENDE

- Village
- Hydrographie
- Limite District
- Limites AP Anjajavy
- Zone de conservation des Mangroves III
- Noyau dur I
- Réserve marine
- Zone d'utilisation durable
- Zone de prélèvement II
- Zone d'occupation controlée
- Zone de restauration
- Zone pastorale

ZONING OF THE PROTECTED AREA BY LANDSCAPING OBJECTIVE

The division of a site, or zoning, with the objective of biodiversity protection and sustainable resource use, into zones of development is a fundamental step which aims to recognise and to protect the resources appropriately, and facilitates their management. It must be based on the results of the various studies carried out beforehand as part of the implementation of the New Protected Area.

The 2008 guide recommends the following classifications:

- The Core zone as being the integral preservation perimetre located within the Protected Area and in which, according to the article 6 of the Law No. 2001-005 on the Protected Areas Management Code, any activity, all entry and all traffic are strictly regulated.
- The Buffer zone: zone adjacent to the «Core Zone», in which activities are limited and regulated by regulation to ensure better protection of the Protected Area. (see article 7, paragraph 1 of Law No. 2001-005 on the Protected Areas Management Code). The populations living near a Protected Area may exercise their rights of use in the «Buffer Zone», which are non-commercial samples for domestic, vital and / customary purposes.
- The sub-areas that are part of the «Buffer Zone»:
  - Zones of controlled occupation which are zones of installation, of human occupation existing before the creation of the Protected Area. The occupation is subject to «Cahiers de Charges» defined by regulation;
  - Controlled Use Areas which are areas whose use and removal of natural resources are regulated and controlled;
  - Service areas which are tourist, educational or functional infrastructure areas of the Protected Area.

For category V and VI of New Protected Areas, in addition to the core and the Buffer zone, on the basis of the achievements of the promoters, it is necessary to leave open the definition of other zones with specific management objectives. So besides the zones defined as Buffer zone, we can have the following zones:

- For terrestrial areas:
  - Reforestation areas: Areas with potential for reforestation, for ecosystem restoration or for subsequent exploitation.
  - Agro-Sylvo-Pastoral Zones: Areas where agricultural, forestry and pastoral activities of local communities will be financially and technically supported to significantly reduce pressures on PA.
  - Sustainable Development Zones: sustainable production service area (water regulation, soil protection) and wood and non-wood forest products. They will be dedicated to management transfers in various forms (Kolo Ala, private, VOI, etc.).
- For marine areas:
  - Fishing Reserves Areas: Areas where temporary and rotating community protection activities will be put in place to improve and sustain the farms.
  - Fishing and Circulation Areas: Movement zones for goods and people and also permanent fishing zones complying with the regulations in force (application of the legislation) or subject to access charters for local resources (Dina) for the sustainable management of natural resources.

An initial zoning was developed during the process of temporary protection in 2017. However, after studies, consultation, confirmation and participatory mapping, the various developments, their objectives and their extent are presented below.

CORE ZONE

The core zone aims to manage the integral conservation of biodiversity and the ecological character of the environment, as well as the conservation of cultural heritage. This zone is essentially composed of dry forests that are slightly degraded or moderately degraded, rich in fauna and flora, with a high endemicity of species. These are the Ampahitobe, Analamanara, Amboaboakan'I Kosomala, Ambaravarambatobe, Bemagandry and Ambatosarimpano, Andrafiatoka, and Matsaboribe avaratra forests.

BUFFER ZONE

The aim of the buffer zone is protection and management with the support of communities for the sustainable management of natural resources.

- Sampling areas, agricultural areas

  It is mainly moderately degraded dry forest or secondary forest. These are the forests of Betainomby, Asariaka, Andranomanara, Avaratr'Ambovonkary, and the forests of Analalava and Ampahitohely. This area is also made up of shrub savannas, mosaics of crops, fallows and relict forests.

- Grazing area

  This area consists mainly of degraded forest, grassland and crop plots, located in Ampahitohely, Atsinanan'ny Matsaborimarovala. It serves as grazing area for livestock of local populations.

- Restauration area

  This zone aims to manage the restoration and rehabilitation of degraded dry forests. This is Ambondro Ampasy Forest. It is surrounded by two areas of mangroves, which constitute a special habitat as sensitive areas.

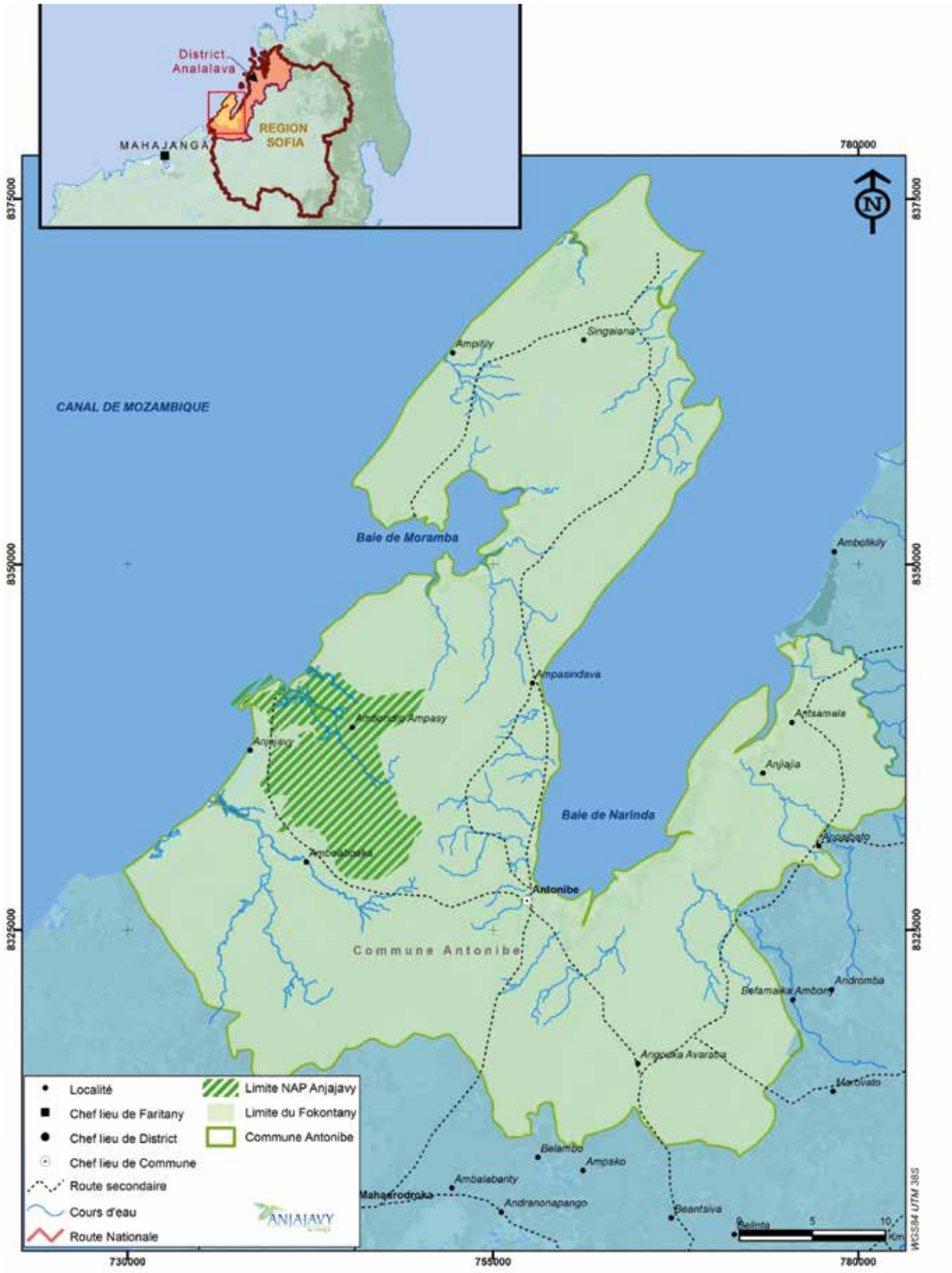
- Mangroves

  The management objective for mangroves is primarily to conserve this particular biodiversity, as well as community support for the sustainable management of natural resources. These mangroves are found at Ambondro Ampasy and Sikony.

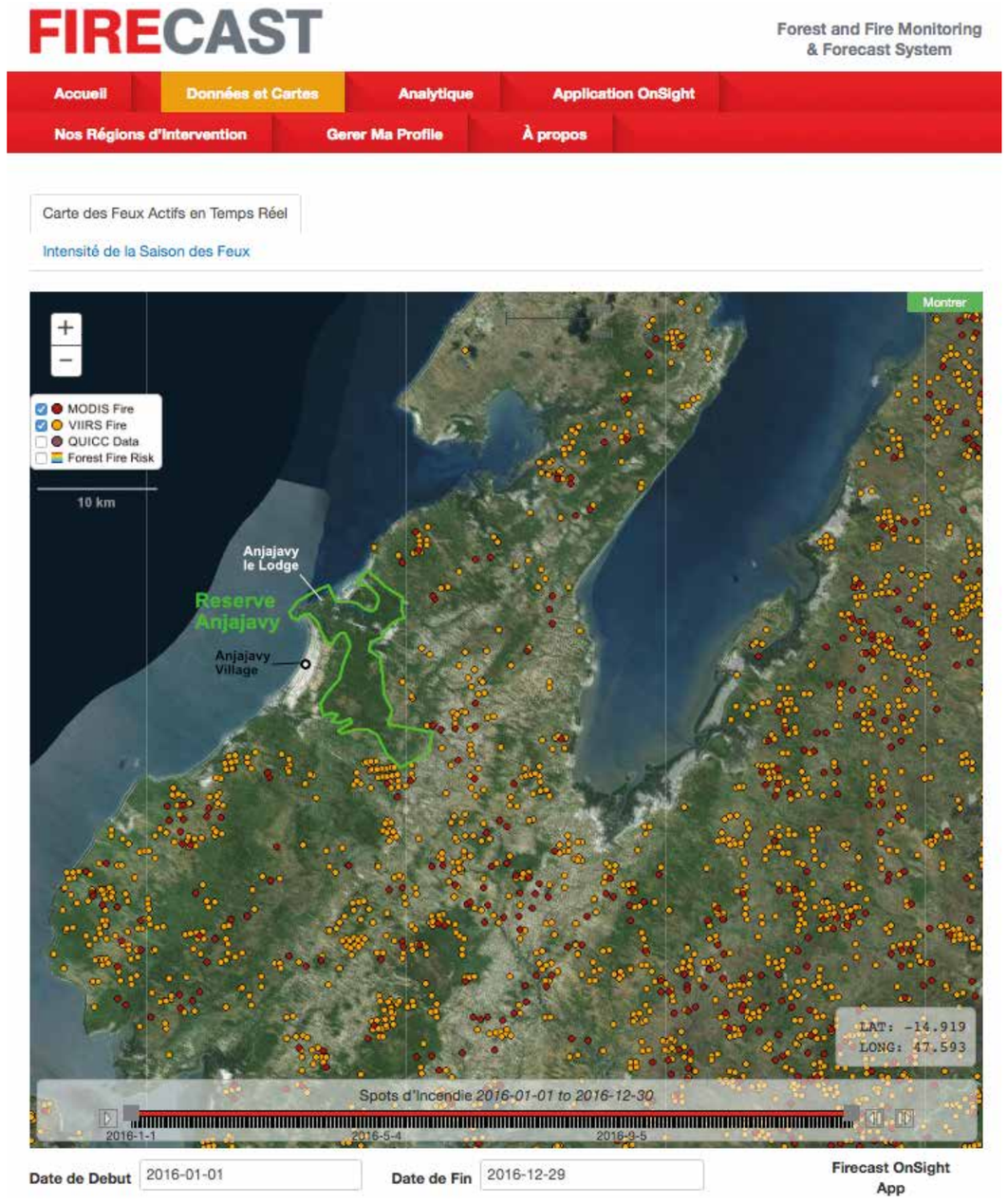
MARINE RESERVE

The purpose of the Marine Reserve is to conserve bird species and their habitat, especially the eagle Ankoay (*Haliaeetus vociferoides*). This area will be reserved for naturalistic observations and ecotourism enhancement.

LOCATION MAP OF THE ANJAJAVY PROTECTED AREA



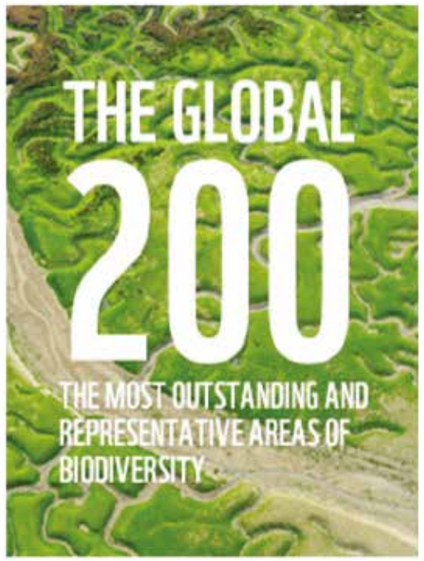
FIRECAST MAP of Fires Occurring Near Anjajavy Reserve from January 1st 2016 to Decembre 29th 2016



Note : the green circled area added by the authors of this report on this Firecast map is delimitating the Anjajavy Private Reserve and Greater Reserve. We can see that the area has been preserved from fires during that period.

Firecast is an application of Conservation International Organization.

DRY DECIDUOUS FORESTS OF WESTERN MADAGASCAR



Scientific code : (AT0202)
Ecoregion Cat. : Afrotropical
Size : 58 400 square miles

Status: **Critical / Endangered**

The dry, deciduous forests of western Madagascar are some of the world's richest and most distinctive tropical dry forests. They are characterized by very high local plant and animal endemism at the species, genera and family levels. A significant portion of these forests have already been cleared, and the remaining forests are fragmented and critically threatened by uncontrolled burning and clearing for grazing and agriculture. Since human settlement of this region, an estimated 97 percent of the island's dry deciduous western forests have been destroyed, and those remaining are extremely localized and isolated. This ecoregion also contains spectacular limestone karst formations, known as tsingy, and their associated forests, including the World Heritage Site of Bemaraha. The river systems and wetlands of this ecoregion are also critically endangered habitats, home to several endemic species of animal.

Habitats

Description

Location and General Description

This ecoregion includes two separate geographic regions: (1) the western side of Madagascar from the Ampasindava Peninsula in the north to Belo-sur-Tsiribihina and Maromandia in the south and (2) the northern part of the island excluding Montagne d'Ambre above 1000 m. This ecoregion is contiguous with the succulent woodlands ecoregion in the southwest and the sub-humid forest ecoregion to the north and east – the latter limit largely coincides with the western edge of the central highlands around 600 m.

The climate of the ecoregion is tropical, with temperatures ranging from a mean maximum of 30° to 33oC and a mean minimum of 8° to 21oC. There is a wet and a dry season, with most of the rainfall from October to April. Precipitation declines from an annual average of around 1,500 mm in the north to around 1,000 m in the south of the region. The ecoregion occupies the rain shadow on the western side of the central highlands of Madagascar and has a relatively long, pronounced dry season.

The elevation of the ecoregion rises gradually from sea level at the western edge to around 600 m at the eastern edge, where it meets the western edge of the central highlands. There are some significant topographic variations throughout the ecoregion, such as the limestone massifs of Ankarana, Namoroka and Bemaraha, and the volcanic cone of Montagne d'Ambre.

The geology of the ecoregion is varied, being rather complex in some zones, and includes ancient Precambrian basement rocks, unconsolidated sands, and Tertiary and Mesozoic limestone (Du Puy and Moat 1996). While most of the forest on the Tertiary limestone has been destroyed, the spectacular karsts of the Mesozoic limestone and the associated forest patches are more or less intact. The ecoregion is a mosaic of dry deciduous forest, degraded secondary forests and grasslands. It is believed that prior to human colonization of Madagascar around 2000 years ago, most of the ecoregion was covered with dry deciduous forest. The secondary grasslands are a result of frequent burning of the dry forest. They are similar to the secondary grasslands of the central highlands with very low faunal and floral diversity, dominated by alien plant species. These grasslands are virtually sterile landscapes. By contrast, the largely undisturbed dry deciduous forests of western Madagascar have a high diversity of endemic plant and animal species.

The forest is essentially deciduous with most trees losing their leaves during the dry season (May to October), and consequently, relatively heavy leaf litter is a characteristic of the forest. The different soils relating to the various geological substrates is reflected in notable structural and taxonomical differences in the forests of the region. For example, the most luxuriant forests with the highest canopies (10 to 15 m) are found on the richer soils. The forests on the sandy soils have shorter canopies (10 to 12 m), and forests on the calcareous rocks and soils are stunted (Nicoll and Langrand 1989). The plant families represented in the canopy are Leguminosae, Bignoniaceae, Euphorbiaceae, Sapindaceae, and Anacardiaceae. In the scrub layer, there is a diversity of liana species of the Asclepiadaceae family and shrubs of the Leguminosae and Rubiaceae families. There is very little herb layer, though some forests have a carpet of Lissochilus orchids. Some of the distinctive plants in the forests include the flamboyant tree, Delonix regia (family Leguminosae), and several species of baobabs (Adansonia, family Bombacaceae). Distinctive Pachypodium spp. occur on the drier, calcareous soils of the west.

The tsingy massifs are often dissected by canyons where dry deciduous forest grows. Dominant canopy trees in Ankarana include *Dalbergia* and *Cassia spp.* (Leguminosae), *Ficus spp.* (Moraceae) and *Adansonia madagascariensis*. There is a diverse shrub layer but few epiphytes. The tsingy plateau inlcudes excellent habitat for drought-adapted succulents. Species found on Ankarana include *Pachypodium decaryi*, *Adenia neohumbertii* (family Passifloraceae) and several species of Euphorbia: *E. ankarensis, E. pachypodiodes*, and *E. neohumbertii var. neohumbertii* (Preston-Mafham 1991).

Biodiversity Features

The Madagascar dry deciduous forest forms a major part of the western center of endemism in Madagascar (White 1983) and the dry, deciduous forests of this region have high biological importance. While the species diversity is not as high as in the moist eastern forests, the levels of endemism are higher. White (1983) estimated generic/specific plant endemism as 20 and 70 percent, respectively.

Many plant species are unusual looking as a result of adaptations to the dry climate, and hot, exposed conditions found on the tsingy formations. While succulents are found throughout arid regions of Madagascar, the dry forest species differ from the succulent species seen further south in succulent woodland and spiny thicket ecoregions. In the dry deciduous forest succulence is rarely seen in the leaves, but is more common

in the main tissues. Bottle trees and bottle lianas are common, including those of the genus Adenia, and the thorny long-necked bottles of Pachypodium. Pachycaul tree species include four species of Adansonia, several *Moringa*, and *Delonix hildebrantii* (Rauh 1995). Another adaptation against dehydration can be seen in *Platycerium quadridichotomum*, which has the ability to completely dry up and then revive itself after rainfall. Bottle lianas and *Begonia spp.* respond to drought by losing most of their aerial parts, while western bamboo species completely lose their leaves in the dry season (Guillaumet 1984).

The fauna of the deciduous dry forest ecoregion has some overlap with that of the succulent woodlands, but it is mostly distinct, endemic and diverse. There is high beta diversity of lemur species across a latitudinal gradient, with five subspecies of Propithecus, three species of Lepilemur, and five species of Microcebus found throughout the ecoregion. The alpha diversity is also high within habitats in the ecoregion. In some primary dry deciduous forest sites, there are eight known sympatric species of lemurs, many of which are endemic to the region and which represent four of the five endemic and endangered families of primates in Madagascar.

Endemic mammals species to the ecoregion include the golden-crowned sifaka (*Propithecus tattersalli*), mongoose lemur (*Eulemur mongoz*), western forest rat (*Nesomys lambertoni*), golden-brown mouse lemur (*Microcebus ravelobensis*), northern rufous mouse lemur (*M. tavaratra*), western rufous mouse lemur (*M. myoxinus*), Perrier's sifaka (*Propithecus diadema perrieri*), Milne-Edwards's sportive lemur (*Lepilemur edwardsi*), and a species of forest mouse, *Macrotarsomys ingens*. Lemur species, particularly the brown lemur (*Eulemur fulvus*), may be critical to the regeneration of the forests because they are some of the few and potentially most important seed dispersers in this diverse forest (Ganzhorn et al. 1999).

The dry deciduous forests are one of the primary habitats for the island's largest predator, the Fossa (*Cryptoprocta ferox*), and some of the smaller endemic Carnivora. The rivers and lakes of the ecoregion are critically important habitats for the endemic and endangered Madagascar sideneck turtle (*Erymnochelys madagascariensis*). This species represents a significant «Gondwanaland relic,» as its closest relatives are in the Podocnemis genus of in South America. The scrubland and bamboo forests of the ecoregion are the habitat of one of the most endangered reptiles in the world, the ploughshare tortoise (*Geochelone yniphora*). Other critical endemic reptiles of the ecoregion include the chameleons *Brookesia bonsi*, *B. decaryi* (C. Raxworthy 2000, pers. comm.) At least three chameleon species are endemic to this ecoregion, these include *Furcifer tuzetae*, *F. rhinoceratus*, and *F. angeli*. The dwarf chameleons *Brookesia exarmata* and *B. perarmata* are endemic to the Tsingy of Bemaraha. The colorful arboreal snake *Lycodryas stenophis citrinus* is only recorded from Tsingy de Bemaraha and Namoroka region. Several geckos are endemic to this ecoregion including *Paroedura maingoka, P. vazimba, P. tanjaka, Uroplatus geuntheri*, and *Lygodactylus klemmeri*, the latter is only known from the Tsingy de Bemaraha. Futher, the region also holds several endemic skinks species including *Mabuya tandrefana, Pygomeles braconnieri*, and *Androngo elongatus*. Recently new species of plated lizard were described from the ecoregion -- *Zonosaurus bemaraha* in the southern portion and *Z. tsingy* in the northern portion (Raselimanana et al. 2000).

The ecoregion contains important habitats for 131 of the 186 resident terrestrial bird species listed for Madagascar (Langrand 1990). Several of these species are associated with lakes and rivers of the region, such as the Manambolo, Betsiboka, Mahajamba, and their satellite lakes. These species include Bernier's teal (*Anas bernieri*), Madagascar fish eagle (*Haliaeetus vociferoides*), Humblot's heron (*Ardea humblotii*) and the Sakalava rail (*Amaurornis olivieri*) (Stattersfield et al. 1998). These birds are dependent on wetlands and they are becoming increasingly isolated and restricted due to habitat fragmentation and conversion to rice paddy. Some of these species also use the fringes of the mangroves on the western coast of Madagascar (see ecoregion description). Several bird species are confined to the western forests, have limited or disjunct ranges, in some cases associated with habitat fragmentation including Van Dam's vanga (*Xenopirostris damii*), and white-breasted mesite (*Mesitornis variegata*).

Several other species of plants and animals endemic to the ecoregion are also particularly threatened due to their restricted ranges. These include two of the six Malagasy endemic baobab species (*Adansonia grandidieri* and *A. suarezensis*), two species or subspecies of primate, Perrier's sifaka and golden crowned sifaka, western forest rat, and ploughshare tortoise.

The dry deciduous forest ecoregion includes a narrow and fragmented band of coastal, or littoral, forests. Most of these littoral forests have already been degraded or destroyed, but the remaining areas are known to contain rare and locally endemic genera and species of plants (Du Puy and Moat 1996).

Current Status

A majority of the western forests have been destroyed (Jenkins 1987). The area's dry forest habitat, as mapped by White (1983), shows that the main areas of intact forest are located near the western coast, and the areas closest to the central highlands re already composed of secondary grassland. More recent surveys indicate that the remaining forest is smaller than originally thought and ranges from 12,000 to 20,000 km^2 (Du Puy and Moat 1996). Most of this forest is in small fragments of 35 km^2 or less, with only 55 blocks larger than 35 km^2 and only 5 blocks larger than 500 km^2 (Morris and Hawkins 1999). Many of the isolated blocks of remaining primary forest are found in a number of protected areas, but there are some important areas of dry forest habitat that are not protected at the present time. The largely intact forests that are found in protected areas are often insignificant and the existing mechanisms for managing and monitoring these areas may not be effective in protecting the forest (Nicoll and Langrand 1989). Key protected areas include Ankarafantsika National Park (605 km^2) and Tsingy de Bemaraha World Heritage Site (1520 km^2). A priority-setting workshop identified several sites in need of immediate biodiversity protection (Ganzhorn et al. 1997). In the north, these sites include Daraina and the Andavakoera and Irodo areas. Further south, the Bemaraha site is considered a priority for enlargement.

Types and Severity of Threats

The major threat to the dry, deciduous forests is destruction and fragmentation through intentional burning to clear land for grazing and agricultural lands, and through wildfires sparked by burning adjacent secondary grasslands. With an expanding rural population and increasing degradation of existing arable lands, the pressure on the remaining forest is extremely high. Selective logging and the removal of large trees pose additional threats of forest habitat degradation. It is likely that much of the remaining forest is already secondary forest that has been selectively logged and has lost the largest of its trees. These degraded forests do not support viable populations of at least 7 of the 8 species of lemur found in more intact forests (Ganzhorn 1995). Several species of diurnal lemurs are hunted for food, and this may be adversely affecting the regeneration of the forests (Ganzhorn 1995, Ganzhorn et al. 1999).

River, wetland, and lake systems are threatened with siltation resulting from deforestation of adjacent forests and soil erosion and run-off from the central highlands. Lakes and wetland habitats are also being destroyed through rice paddy cultivation, over fishing, and invasive species (e.g. water hyacinth, Eichornia crassipes).

Justification of Ecoregion Delineation

This ecoregion follows the dry bioclimatic zone of Cornet (1974) that extends inland to the 600 m contour. This is believed to provide a better reflection of original vegetation than the 950 m contour that Humbert and Cours Darne (1965) used to define their Western Domain phytochoria. The western ecoregion has its southern limit in the Belo-sur-Tsiribihina and Maromandia region and extends to the northern portion of the island (not including Mt. Ambre). There is an eastern extension of this region running from the Ampasindava Peninsula to the Vohémar area.

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Prepared by: Helen Crowley

Reviewed by: In progress

http://www.worldwildlife.org/ecoregions/at0202

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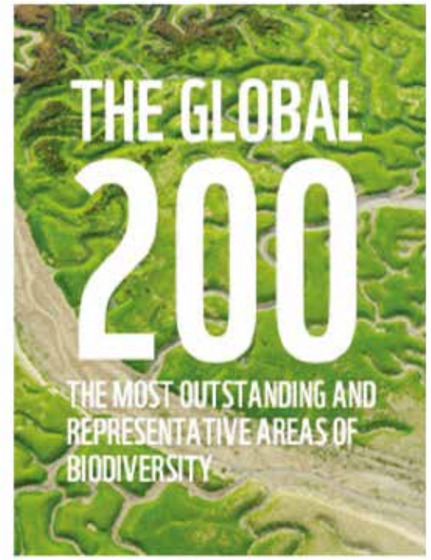
MADAGASCAR MANGROVES



Scientific code : (AT1404)

Ecoregion Cat. : Afrotropical

Size : 2100 square miles

Status: **Vulnerable**

Protected from monsoon winds by the central mountains, Madagascar mangroves occupy a wide range of environmental and climatic conditions along the western coastline in. Although the ecoregion's species richness is low, it is unusual in supporting some endemic tree species. The mangroves also shelter highly diverse mollusk and crustacean communities while capturing sediment that threatens reefs and seagrass beds. Birds, sea turtles, and dugongs all utilize mangroves, as do the Malagasy people. Rice farming, shrimp aquaculture and construction materials are all obtained from these mangroves.

Habitats

Description

Location and General Description

On Madagascar, mangroves are found primarily along the western coast. They occur in a wide range of environmental and climatic conditions, fostered by a low coastal platform, high tidal range, and a constant freshwater supply from numerous rivers that also bring a high silt load which is deposited along the coast (CEC 1992, Rasolofo 1993). The largest mangrove stands are found at Mahajamba Bay, Bombetoka, south Mahavavy and Salala, and Maintirano (Spalding et al. 1997). Mangroves occupy a stretch of coastline of approximately 1,000 kms in length where they are often associated with coral reefs, which protect the mangroves from ocean swells. The mangroves, in turn, capture sediment from the interior lands that threatens both reefs and seagrass beds. The southern part of Madagascar has fewer mangroves because, in addition to having a longer dry season and lower rainfall, it is subject to intensive ocean swells and lacks the necessary alluvial sediments deposited by major river systems. This latter point is especially true of the eastern side of the island.

Water temperatures are relatively even from north to south, and rainfall varies with climatic zones that range from 2,000 mm in the humid subequatorial north to 350 mm in the dry subtropical south. Madagascar has two seasons: a cool dry season from May through October, and a warm humid season from November through April. Salinity variation is greater along the northwest coast where rainfall is higher, ranging between 31.8% at the end of the rainy season to 35.2% at the end of the dry season (Rasolofo 1993). On the western coast, the

tidal range may reach up to 4 m during the equinoctial periods (Gaudian et al. 1995), compared with 0.75 m on the east coast. Major rivers, which flow towards the west coast are the Mangoky, the Tsiribihina, and the Betsiboka.

Although up to nine mangrove tree species have been recorded (Gaudian et al. 1995), most of the Madagascar mangrove stands contain six species in four families: Rhizophoracae (*Rhizopora mucronata*, *Bruguiera gymnorrhiza* and *Ceriops tagal*), Avicenniaceae (Avicennia marina), Sonneratiaceae (*Sonneratia alba*) and Combretaceae (*Lumnitzera racemosa*) (Rasolofo 1993). Other reported species are: *Ceriops tagal*, *Xylocarpus granatum*, and *Heritiera littoralis*. The primary colonizers are Sonneratia and Avicennia. Rhizopora and Bruguiera are found behind them or along creeks. Finally, Bruguiera, Ceriops tagal and Xylocarpus are found in the tidally inundated areas. Other plant species found in the Madagascar mangroves are summarized in Koechlin et al. (1974).

Biodiversity Features

Several of the Madagascar endemic birds are found in the coastal areas of western Madagascar where they use mangrove and associated wetland habitats. These species are the Madagascar heron (*Ardea humbloti*, VU), Madagascar teal (*Anas bernieri*, EN), Madagascar plover (*Charadrius thoracicus*, VU), and Madagascar fish eagle (*Haliaeetus vociferoides*, CR) (Stattersfield et al. 1998). The Madagascar kingfisher (*Alcedo vintsioides*) is also believed to occur in the mangroves. This habitat is important for migratory bird species, such as common ringed plover (*Charadrius hiaticula*), crab plover (*Dromas ardeola*), gray plover (*Charadrius squatarola*), African spoonbill (*Platalea alba*) and great white egret (*Egretta alba*).

Some sea turtles, primarily green turtle (*Chelonia mydas*, EN) and hawksbill turtle (*Eretmochelys imbricata*, CR), nest along the western coast and are occasionally found in mangroves. The declining species Dugong (*Dugong dugong*, VU), and Nile crocodile (*Crocodylus niloticus*) are also found in the mangroves.

There is particularly high diversity among the fish populations, the families of which include: M*ugelidae, Serranidae, Carangidae, Gerridae, Hemiramphidae, Plectrorhynchidae* and *Elopidae* (CEC 1992). The neighboring coral reefs that are associated with the mangroves have also been noted for extremely high fish diversity (Rasolofo 1993). There is also high diversity among the mollusks, and crustaceans

Current Status

Estimates of extant mangrove area range from 2,170 to 4,000 km^2, with 3,270 km^2 considered the most likely figure (Spalding et al. 1997). Of this, only about 50 km^2 are found on the east coast at 11 sites (Spalding et al. 1997). In contrast, 29 mangrove areas are found on the west coast (Hughes and Hughes 1992). More than half of these are found at four sites (Rasolofo 1993). Some mangroves are found in the existing marine park: Reserve Mananara Biosphere Reserve, that also includes coral reefs (Gaudian et al. 1995).

Types and Severity of Threats

Mangroves are threatened by development of urban areas, overfishing, and erosion caused by tree-cutting in the highlands. Some mangrove areas have been converted to rice farming and salt production. Malagasy Government encourages development of shrimp aquaculture and this habitat type is being increasingly used by the private business sector. Because of relatively low population densities and availability of wood from other sources, direct harvesting of the mangrove trees has been relatively low with the exception of some areas, particularly Mahajanga and Toliara (Rasolofo 1993). However, demographic trends suggest this situation could change in the future (Spalding et al. 1997).

Justification of Ecoregion Delineation

Ecologically, the mangroves of Madagascar are very similar to those of the African mainland. However, they were separated due to their presence in a different biogeographical region (WWF 1998). Nearly all of the mangroves in Madagascar occur along the low-lying western coast. Of these, only the larger stands have been delineated.

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http://www.worldwildlife.org/ecoregions/at1404
wwf.org – oct 2016

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Adapted from Google Map and Google Earth

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