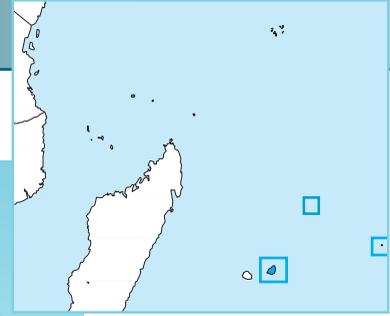


# MAURITIUS

ROGER J. SAFFORD



Mauritius Parakeet  
*Psittacula eques*.  
(ILLUSTRATION: DAVE SHOWLER)

## GENERAL INTRODUCTION

The Republic of Mauritius is in the tropical south-west Indian Ocean, and is composed of a main island (Mauritius, 1,865 km<sup>2</sup>), together with Rodrigues island (109 km<sup>2</sup>), the Cargados Carajos Shoals (St Brandon, total land area around 3 km<sup>2</sup>) and Agaléga atoll (21 km<sup>2</sup>). Mauritius and Rodrigues each have 10–20 associated islets within 25 km of their coasts. Mauritius and Rodrigues are two of the Mascarene Islands, a volcanic archipelago which includes one other high island, La Réunion, 164 km west-south-west of Mauritius. The Mascarenes have never been united or connected to another landmass. Mauritius's nearest continental neighbour is Madagascar, 840 km to the west. Rodrigues lies 574 km to the east, Cargados Carajos 350 km north-north-east and Agaléga 700 km north. In this chapter, the name Mauritius refers to that island; the whole country is referred to as the Republic of Mauritius.

The human population is almost stable, censused at 1,056,660 in 1990 and growing at 0.79% annually. These data gave 1994 estimates of 1.08 million on Mauritius (580 inhabitants/km<sup>2</sup>), and 34,700 on Rodrigues (330/km<sup>2</sup>). These are among the highest population densities in the Afrotropics. Mauritius is divided into nine districts and has a parliament based in the administrative capital, Port Louis. Rodrigues is a single district and, as such, an integral part of the Republic, represented by a Minister for Rodrigues.

The Mascarene Islands once supported one of the richest and most extraordinary vertebrate faunas of any oceanic archipelago, including several endemic genera and two endemic families—the dodo and solitaire (Raphidae, both species now extinct) and the boa-like snakes (Bolyeriidae)—although some authors consider these as subfamilies, of the pigeons (Columbidae) and boas (Boidae), respectively. Since human colonization, most native vertebrate species have been exterminated and the majority of the native vegetation destroyed by the effects of introduced plants and animals, habitat destruction and hunting.

The Republic of Mauritius can be divided into three regions with distinct geology, climate, wildlife and environmental problems.

### ■ Mauritius

Mauritius is the remains of a huge shield volcano, which collapsed, to be overlaid by younger lava-flows, most now variably weathered and eroded into soils. The relief is now mostly mild, with low plains in the north and east rising to a central plateau reaching c.700 m in the south-west. The terrain is broken by small (no higher than 824 m); but spectacular mountains, and by the Black River Gorge system in the south-west. The 200 km of coastline is almost completely encircled by a fringing reef. On the same submarine platform lie 10 low, coralline or raised volcanic islets, together with many smaller rocks.

The plateau is extremely humid, receiving around 3,000 mm of rainfall annually (locally 5,000 mm), but also relatively cool (annual mean around 20°C). The lowlands are drier and hotter (1,000–1,800 mm rainfall, annual mean temperature 24–25°C). From December to April are the wettest, hottest months; September–November are driest, June–August coolest. The heaviest rainfall is brought by cyclones. Intense cyclones (sustained wind speeds for one hour over 110 km/hr) occur on average less than once per decade, but 21 depressions produced gusts over 100 km/hr on Mauritius between 1970 and 1989.

The island was almost entirely forested until human colonization in 1638. The uplands supported lower montane wet evergreen forest (with patches of cloud-forest), scrub (including ericoid heath) and marsh vegetation, depending on edaphic conditions. In the rain-shadow a drier evergreen or semi-deciduous forest dominated, with palm-savanna in coastal areas of the north and west. Of 644 native flowering plant species surviving, 287 (45%) are endemic to Mauritius and 122 (19%) are Mascarene Island endemics. The native fauna included at least 68 native vertebrate species that bred on land (birds, mammals and reptiles), 37 butterflies and 128 land-snails. Of these, 32 (47%) of the vertebrates, 83 (65%) of the snails and four (11%) of the butterflies are or were endemic to Mauritius.

Map 1. Location and size of Important Bird Areas in Mauritius.



A further seven (10%) of the vertebrates, 38 (30%) of the snails and two (5%) of the butterflies were endemic to the Mascarenes. Considering only resident breeders (thus excluding seabirds, turtles and *Dugong dugon*), there were 51 vertebrate species: 63% Mauritius-endemic and 14% Mascarene-endemic. However, these species totals are preliminary, as ongoing taxonomic, historical and osteological studies continue to reveal additional species among the extinct and extant fauna; this also applies to Rodrigues.

By the 1990s, human colonists had brought about the loss of 95% of the native vegetation (less than 100 km<sup>2</sup> remains), 46% (31 of 68) of the native vertebrate fauna (including more than half of

the birds) and 30% of the land-snails. At least 39 plant species and 17 vertebrates had become globally extinct, while 40% of the native flora and 54% of the surviving vertebrates were reduced to globally threatened status. In addition, numerous plant and animal species have been introduced, of which around 683 plant, 12 mammal, 18 bird, nine reptile and two amphibian species have become naturalized.

Native wildlife is largely associated with native vegetation fragments. Even in reserves the native vegetation is progressively degrading, and this therefore presents a chronic problem for native wildlife. The degradation takes the form of a gradual shift in floristic composition towards exotic species, but the mechanisms responsible

are not fully understood. Of at least 47 invasive plant species, the most damaging include, in humid areas, *Ligustrum robustum*, *Psidium cattleianum*, *Syzygium jambos* and *Ravenala madagascariensis* and, in drier areas, *Hiptage benghalensis*, *Lantana camara*, *Leucaena leucocephala* and *Flacourtia indica*.

Several exotic animals affect the native flora, for example, by destroying native plants, seedlings, fruit or seed, or by spreading exotic plants. Birds, hares *Lepus nigricollis*, deer *Cervus timorensis*, pigs *Sus scrofa*, goats *Capra hircus*, monkeys *Macaca fascicularis*, rats *Rattus rattus* and *R. norvegicus*, and giant snails *Achatina* spp. are thought to be the main culprits. On the islets, rabbits *Oryctolagus cuniculus* have also caused damage. Exotic animals also affect fauna, as predators (especially *Rattus rattus* and *Macaca fascicularis*), which limit some native bird and reptile distributions and populations. Some may also be resource competitors and vectors for pathogens (such as viruses and blood-parasites) that cause diseases.

Much state- or privately-owned land is used for deer-ranching and hunting. Such management prevents large-scale deforestation, but is not optimal for native wildlife, particularly because hunting requires high stocking densities of deer, which damage native vegetation, affecting many areas. It has also led to the creation of many tracks and clearings, causing localized forest loss and soil erosion. Habitat alteration by cyclones is a further threat to native fauna.

### ■ Rodrigues

Rodrigues, one of the world's most isolated islands, is the basal remains of a volcano, which has collapsed and eroded to produce a terrain that is hilly, with a central ridge (to 393 m) and valleys (some precipitous) radiating from it, and a wide lagoon and fringing reef. Inside the reef lie 20 sand, coralline or raised volcanic islets, and smaller rocks. Annual rainfall is generally in the range of 1,000–1,700 mm, and annual temperatures around 24°C (like lowland Mauritius), but total rainfall is greatly influenced by the number of cyclones that affect the island, some of which have been catastrophic, bringing the strongest winds ever recorded in the Mascarenes and causing severe damage to human communities and wildlife.

A rather open forest once covered the island. Native wildlife included 132 native flowering plant species, at least 39 native vertebrate species that bred on land (birds, mammals and reptiles), and 27 native land-snails. Of these, 44 (33%) of the plants, 20 (51%) of the vertebrates and 15 (56%) of the snails were endemic to Rodrigues, and 18% of the plants were Mascarene endemics. The island held 23 resident breeding vertebrates, 87% endemic to Rodrigues.

Human colonization has had consequences even more severe than on Mauritius. The native forest has been entirely destroyed. Eight endemic plant species have gone extinct and all surviving native plants are threatened. All native land vertebrates except three birds, two reptiles and a bat have been exterminated, as have eight land-snail species. Naturalized or free-ranging exotics include 290 plants (at least 13 invasive), seven mammals (including *Rattus rattus* and *R. norvegicus*, but not *Macaca fascicularis* as on Mauritius), seven birds and 12 land-snails and slugs. Much of the island is now treeless and overgrazed. Native plants are scattered, with small patches of degraded communities. The three endemic vertebrates (two birds and the fruit bat *Pteropus rodricensis*) are more associated with exotic forest and thickets than with these patches, but continuing rehabilitation of native vegetation is likely to enhance its importance to them. Continuing conservation or environmental problems include exotic plant and animal species invasion, habitat destruction (although this problem is under better control than in the past), water shortage and the effects of violent cyclones.

### ■ Agalega and the Cargados Carajos Shoals

Agalega (10°24'S 56°38'E) is a coral atoll comprising two islets, with 300 inhabitants engaged in coconut production. Although it supports tiny populations of *Plegadis falcinellus* and *Streptopelia picturata* of unknown taxonomic status, Agalega does not qualify as an Important Bird Area and will not be discussed further. Cargados Carajos (15°23'S 59°27'E) comprises low islets, coral reefs and sandbanks spread over more than 1,000 km<sup>2</sup> of ocean. It supports abundant marine life, including a rich fishery. The whole of Cargados Carajos is treated as a single Important Bird Area, and its fauna is highly threatened by over-exploitation and disturbance.

## ORNITHOLOGICAL IMPORTANCE

As expected for any remote, oceanic island group, the Republic of Mauritius is poor in species, but has a very high proportion of threatened and endemic taxa. The present avifauna of around 112 species comprises 13 native landbird species, 16 breeding native waterbirds and seabirds, 43 regular migrants (including all seabirds that do not regularly breed), 22 accidentals, and 18 naturalized exotics. Little is known of the importance of the Republic's waters for non-breeding seabirds. Populations of migrants (mainly shorebirds) are not important internationally.

### ■ Mauritius

Mauritius supports one of the densest concentrations of threatened bird species in the world. The seven endemic landbird species are

			16 IBAs covering c.443 km <sup>2</sup>					
IBA code	Site name	Administrative region	Criteria (see p. 11; for A2 codes, see Table 2)					
			A1	A2		A4i	A4ii	A4iii
				102	103			
MU001	Fouge mountain range	Black River	✓	✓				
MU002	Southern slopes	Savanne, Black River	✓	✓				
MU003	Macchabé-Brise Fer forest	Black River, Plaine Wilhems	✓	✓				
MU004	Relict forests of central plateau	Plaine Wilhems, Moka, Grand Port	✓	✓				
MU005	East coast mountains	Grand Port, Flacq	✓	✓				
MU006	Plaine des Roches	Flacq	✓	✓				
MU007	Pont Bon Dieu	Flacq	✓	✓				
MU008	Moka mountains	Moka, Plaine Wilhems, Pamplemousses	✓	✓				
MU009	Ile aux Aigrettes	Grand Port	✓	✓				
MU010	Gunner's Quoin	Outer Islets	✓ <sup>1</sup>					
MU011	Flat and Gabriel Islands	Outer Islets	✓ <sup>1</sup>					
MU012	Round Island	Outer Islets	✓ <sup>1</sup>				✓	
MU013	Serpent Island	Outer Islets				✓	✓	
MU014	Rodrigues mainland	Rodrigues	✓	✓				
MU015	Rodrigues islets	Rodrigues	✓ <sup>1</sup>				✓	
MU016	Cargados Carajos shoals	Outer Islets				✓	✓	
Total number of IBAs qualifying:			14	9	1	2	1	4

1. Sites 010, 011, 012 and 015 do not currently hold any native landbird species of global conservation concern. They are, however, suitable for rehabilitation; the introduction of such species is planned, and prospects for implementation of plans are genuine.

all threatened: *Falco punctatus* (EN), *Columba mayeri* (CR), *Psittacula eques* (CR), *Coracina typica* (VU), *Hypsipetes olivaceus* (VU), *Zosterops chloronothus* (CR) and *Foudia rubra* (CR). Three species are shared only with La Réunion: *Collocalia francica* (NT), *Terpsiphone bourbonnensis* (endemic subspecies *desolata*) and *Zosterops borbonicus* (endemic subspecies *mauritanus*). All 10 species listed above are restricted-range species that belong to the Mauritius Endemic Bird Area (EBA 102), which covers the whole of the island. One exotic, *Anas melleri* from Madagascar, is a near-threatened restricted-range species.

Large seabird populations on the northern islets include the sole (and very vulnerable) Afrotropical and Indian Ocean colony of *Pterodroma arminjoniana* (but see ‘Comments on the inventory’), together with significant congregations of *Puffinus pacificus*, *Phaethon rubricauda*, *Phaethon lepturus*, *Sterna fuscata*, *Anous stolidus* and *Anous tenuirostris*, among other species.

The main concentrations of threatened species occur in the upland native forest of south-west Mauritius, but some species extend into the lowlands and also the eastern mountains. Exceptionally, the main population of *Terpsiphone bourbonnensis* lives in exotic plantations in the north-east. *Collocalia francica* is a widespread but scarce breeder in caves. The tiny population of *Anas melleri* lives in a few lakes and marshes on the central plateau.

### ■ Rodrigues and other islands

Both native landbirds of Rodrigues are threatened, single-island endemics that belong to the Rodrigues Endemic Bird Area (EBA 103): *Acrocephalus rodericanus* (CR) and *Foudia flavicans* (EN). They live sympatrically in forest and thickets in the centre of the island. Modest breeding populations of seabirds are found on the islets of Rodrigues, while much larger populations of these (but no landbirds) inhabit Cargados Carajos. Species that occur in significant numbers are *Sterna fuscata*, *Anous stolidus*, *Anous tenuirostris* and, possibly, *Gygis alba* and *Sterna dougallii*.

## CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

The major legislation relevant to Important Bird Areas comprises the Forest and Reserves Act (Act no. 41 of 1983) and subsequent amendments, the Environment Protection Act (Act no. 34 of 1991), and the Wildlife and National Park Act (Act no. 13 of 1993); the latter replaced the Wildlife Act of 1983. In 1985, a National Conservation Strategy was produced, followed in 1988 by a 10-year National Environmental Action Plan (NEAP). A Phase Two NEAP was completed in 2000.

**Table 2.** The occurrence of restricted-range species at Important Bird Areas in Mauritius. Sites that meet the A2 criterion are highlighted in **bold**. Species of global conservation concern are highlighted in **blue bold**.

102 – Mauritius Endemic Bird Area (10 species in Mauritius; nine sites meet the A2 criterion)										
IBA code:	001	002	003	004	005	006	007	008	009	
<i>Falco punctatus</i>	✓	✓	✓		✓			✓	✓	
<i>Columba mayeri</i>		✓	✓						✓	
<i>Psittacula eques</i>		✓	✓	✓						
<i>Collocalia francica</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	
<i>Coracina typica</i>		✓	✓	✓						
<i>Hypsipetes olivaceus</i>	✓	✓	✓	✓	✓					
<i>Terpsiphone bourbonnensis</i>	✓	✓	✓	✓		✓				
<i>Zosterops borbonicus</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	
<i>Zosterops chloronothus</i>		✓	✓	✓						
<i>Foudia rubra</i>		✓	✓	✓						
Number of species recorded:	5	10	10	8	4	3	2	3	2	
103 – Rodrigues Endemic Bird Area (two species in Mauritius; one site meets the A2 criterion)										
IBA code:										014
<i>Acrocephalus rodericanus</i>										✓
<i>Foudia flavicans</i>										✓
Number of species recorded:										2

Nature Reserves and the one National Park cover a total of 7,413 ha, less than 50 ha of which are on Rodrigues. On Mauritius, these areas are controlled by the National Parks and Conservation Service and the Forestry Service, both of which are part of the Ministry of Agriculture, Food Technology and Natural Resources (formerly the Ministry of Agriculture, Fisheries and Natural Resources). Remaining state-owned forests are controlled by the Forestry Service, and may be declared by the Minister to be National Forest, which cannot be converted to any other land-use, although leasing for deer-ranching is possible. On Rodrigues, the reserves are the responsibility of the Forestry Division of the Rodrigues Island Administration. On both islands, additional privately-owned forest is protected by watershed- and soil-protection regulations, as Mountain and River Reserves. Use of State Lands and Mountain Reserves is subject to a range of conditions and restrictions, including prohibitions on species introduction and removal of forest produce.

- **Nature Reserve**—There are 18 sites, state-owned. The first was established in 1951; by 1990, 20 existed, but some have been combined and merged into the National Park, leaving 14 (including seven islets) covering 799 ha on Mauritius and four (two of which are islets) covering a total of 40–46 ha (quoted sizes vary) on Rodrigues. The overriding management priority is that ‘no person shall in any way interfere and damage any feature’ of a Nature Reserve. Their locations were based mainly on native plant distribution. Responsibility for the Reserves on Mauritian islets falls mainly under the National Parks and Conservation Service, whereas those on the mainland remain mainly under Forestry; the division of responsibility is, however, flexible.
- **National Park**—There is one National Park (in two parcels, of 6,372 ha and 202 ha), state-owned under the National Parks and Conservation Service. The Black River Gorges National Park was proclaimed in 1994 by linking and expanding Macchabé–Bel Ombre and Combo Nature Reserves. Macchabé–Bel Ombre Nature Reserve had earlier (in 1977) been proclaimed a Biosphere Reserve (3,611 ha) under the Man and Biosphere Programme of UNESCO. The park’s major purpose is wildlife conservation, but use is zoned to allow recreation (including tourism), education and intensive wildlife management. It protects 44% of the island’s native vegetation and a larger proportion of its native bird populations, but an area critical for native wildlife was excluded from the original boundary, because funds were not available for compulsory purchase of this privately-owned land. To date, this area remains excluded.
- **Mountain Reserve/River Reserve**—These designations were established with the major aim of watershed and soil protection rather than biodiversity conservation, and so are not protected areas as defined by IUCN. However, they are extensive and require permanent tree-cover on riversides and the upper parts of mountain slopes (respectively), and so are vitally important for native wildlife. On Mauritius, Mountain Reserves cover around 3,800 ha in 20 parcels, with River Reserves (2,740 ha) widely scattered; at least 28 parcels of River and Mountain Reserves exist on Rodrigues. Privately-owned River Reserves or Mountain Reserves are not all native forest. On Mauritius, they can be used for deer-ranching provided that no trees are removed without special permission.

Mauritian and Rodriguan species and ecosystems are threatened by several influences other than habitat destruction, such as invasion by exotics and predation. Protected areas do not automatically exclude such influences, and active management is required if conservation is to be achieved. To attempt this task, a long history of local commitment to conservation has been helped since 1973 by international organizations, and the creation of a national non-governmental organization, the Mauritian Wildlife Foundation (MWF, formerly Mauritius Wildlife Appeal Fund). A consortium of the Government of the Republic of Mauritius, MWF and collaborating organizations have carried out a highly successful, continuing wildlife conservation programme, rescuing several plant and animal species and wildlife communities from extinction through habitat protection and rehabilitation, and management *in situ* and *ex situ*. Permanent infrastructure includes a captive-breeding centre with associated release aviaries in native forest (for

captive-breeding or rearing and reintroduction programmes), and several field stations and plant nurseries.

## INTERNATIONAL MEASURES RELEVANT TO THE CONSERVATION OF SITES

Mauritius has ratified the Conventions on Biological Diversity (CBD), International Trade in Endangered Species (CITES), and Protection of the World Cultural and Natural Heritage (World Heritage Convention). It is a party to the Convention to Combat Desertification, the Convention on Climate Change and the African–Eurasian Waterbird Agreement and also participates in the UNESCO Man and Biosphere Programme. Other agreements include the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, United Nations Convention on the Law of the Sea (UNCLOS), and the Convention on Fishing and Conservation of Living Resources of the High Seas.

## OVERVIEW OF THE INVENTORY

This inventory contains 16 Important Bird Areas (IBAs), covering c.443 km<sup>2</sup>, equivalent to 22% of the Republic's land surface area (Table 1, Map 1). The restricted distributions of threatened birds and waterbird and seabird colonies are well known, from reliable data from the 1990s. Therefore, this fairly small network of sites includes almost all of these populations. The nesting caves of the near-threatened *Collocalia francica* are poorly documented, but one large and several small colonies are included. All sites are at least partially protected, excepting the Plaine des Roches (IBA MU006), Pont Bon Dieu (MU007) and the Cargados Carajos shoals (MU016).

The eight sites on the Mauritian mainland cover 19,740 ha (11% of the island surface). Six sites contain native forest and thicket and adjacent exotic vegetation used by threatened birds, and two sites (Plaine des Roches and Pont Bon Dieu) have exotic vegetation and unvegetated caves of exceptional importance to two bird species. These eight sites contain almost the entire populations of all the island's threatened species. The five sites covering six Mauritian islets (585 ha) include all the important seabird colonies, and also three islets (two sites) that do not presently qualify as Important Bird Areas, but are likely to do so as rehabilitation (beginning in the 1990s) proceeds. Nine sites qualify under the A2 criterion, between them holding all 10 restricted-range species that make up the Mauritius EBA.

One of the two sites on Rodrigues covers around one half of the mainland, and the other covers some of the islets. The two sites include the whole population of both endemic birds, all existing and potential seabird colonies, and islets suitable for rehabilitation and translocation of native landbird species. The final site in this inventory covers the whole of the Cargados Carajos shoals, with all its seabird colonies.

## COMMENTS ON THE INVENTORY

- On Mauritius, a detailed classification for native plant communities was developed by Vaughan and Wiehé (1937), and the terminology brought up to date by Lorence (1978). For the habitats mentioned in the inventory, the habitat classification used by the BirdLife International IBA Programme (see Appendix 7) can be related to Lorence (1978) as follows, although the Lorence categories 'rainforest' and 'cloud-forest' are mentioned where these rare habitats occur.

<i>Lorence</i>	<i>BirdLife</i>
Lowland dry evergreen forest	Lowland forest—dry evergreen
Lowland dry evergreen thicket	Evergreen bushland and thicket
Upland heath and scrub	Shrubland or Bushland and thicket—montane
Upland lower montane wet forest	Montane forest—mixed
Upland rainforest	Montane forest—mixed
Upland cloud-forest	Montane forest—mixed
All secondary communities	Exotic vegetation

- In Africa and Madagascar, montane forest is typically found only above 800 m, whereas in Mauritius it is found as low as 300–400 m. A forest-type transitional between montane and lowland exists where both types occur side by side (IBAs MU001, MU002, MU003 and MU005), but its extent is very small and it is not referred to in the inventory. The low, woody vegetation of parts of the Mauritian uplands (Lorence's 'heath and scrub', also some marsh) is called montane, although it is kept stunted more by edaphic than altitudinal factors.
- Place names and spelling follow those of the Directorate of Overseas Survey (1983, 1991).
- Conservation activity on Mauritius is highly dynamic. This may result in rapid changes in species distribution and population, and in conservation infrastructure. The information presented here is based on data reviewed up to 1998, with special updates for *Acrocephalus rodericanus* and *Foudia flavicans*, which were both surveyed far more thoroughly in 1999 than on any occasion since 1974. More recent data would not affect IBA designations.
- Populations of threatened or restricted-range bird species excluded from the set of sites are: increasing numbers of pairs of *Falco punctatus* (which is increasing in exotic vegetation and even urban areas); probably numerous colonies of *Collocalia francica*; parts of the central plateau used by wandering *Hypsipetes olivaceus* and *Zosterops chloronothos*; a few sites for *Terpsiphone bourbonnensis*; and large numbers of the ubiquitous, non-threatened *Zosterops borbonicus*.
- The sites selected include nearly all native vegetation on both Mauritius and Rodrigues (but not all sites that support any native plants), but their relative conservation importance differs between birds and non-birds.
- No freshwater or estuarine wetlands of international importance for birds exist in the Republic of Mauritius; waterbird populations at the nationally famous Terre Rouge estuary (Mauritius) are insignificant on a global scale.
- Information on taxonomy, endemism and distribution of non-birds is taken mainly from the following sources: for plants, Strahm (1989, 1993) and Walter and Gillett (1998); for reptiles, Tonge (1989) and Vinson (1976), but major taxonomic revision is ongoing; for mammals, Bell *et al.* (1994); for land-snails, Griffiths (1994) and V. Florens (per Mauritian Wildlife Foundation, *in litt.* 1998); for butterflies, Williams (1989). Additional information came from the Mauritian Wildlife Foundation, and personal observation by the author. Information on threatened plants is taken from the 1997 IUCN Red List of Threatened Plants, which is based on pre-1994 threat categories, drawn up by the IUCN Species Survival Commission. These have subsequently been revised.
- The *Pterodroma* petrels that nest commonly on Round Island (IBA MU012) were originally identified as *P. neglecta*, then (and ever since) as *P. arminjoniana arminjoniana*. The identification of this population (here treated as *arminjoniana*) remains provisional, however.

## ACKNOWLEDGEMENTS

Human population data are taken from the Central Statistical Office, Government of Mauritius. Information on the conservation infrastructure and protected-area system was compiled from the Ministry of Agriculture, Fisheries and Natural Resources (1985), the Ministry of Environment and Quality of Life (1991, this includes a rare map of Mountain Reserves on Mauritius) and the Forestry Service (1996), updated by the Mauritian Wildlife Foundation. The National Park and Conservation Service provided a detailed map of the National Park boundary. Information on international conventions is taken from the web-sites of the respective conventions. The accounts benefited greatly from up-to-date information provided freely by the Mauritian Wildlife Foundation: Roselle Chapman, Ehsan Dulloo, Carl Jones, Kirsty Swinerton and Vikash Tatayah on numerous subjects, Aleks Maljkovic on Rodrigues, Jim Groombridge on the *Falco punctatus* population, and Vincent Florens on the land-snail fauna. David Showler and Beau Rowlands provided comments on the Rodrigues and Cargados Carajos site accounts respectively. Anthony Cheke provided much valuable information on all aspects, and also data on flycatcher distributions in 1996.

## SITE ACCOUNTS

### Fouge mountain range

Admin region Black River  
Coordinates 20°27'S 57°21'E  
Area 1,400 ha Altitude 20–596 m

MU001

A1, A2 (102)  
Mountain Reserve

#### Site description

This site is composed of two mountain peaks—Piton du Fouge (596 m) and Piton Canot or Chamarel Peak (530 m)—and their slopes in the extreme south-west of Mauritius. The site extends down almost to sea-level in the south and west, and to the Rivière du Cap in the east. The mountains support two small (totalling 450 ha) native vegetation patches, barely connected in the north to the more extensive forest of the Southern slopes. Most native vegetation is mixed montane forest, but dry evergreen lowland forest occurs in the rain-shadow of the west-facing slopes; all is heavily invaded by exotic plants. Surrounding the native vegetation (especially to the east) is a larger expanse of exotic vegetation (forest, scrub and pasture), which is included here because it is used by native wildlife. Part of the area is intensively managed for deer-hunting, for which private vehicle tracks, paths and pastures are maintained.

#### Birds

See Box and Table 2 for key species. The area supports two threatened and one near-threatened species, and five of the 10 restricted-range species that occur on Mauritius. Local densities of *Hypsipetes olivaceus* may be fairly high (5–20 pairs in 1993). *Falco punctatus* has been reintroduced since 1991 and in 1998 there were 1–10 pairs, probably increasing. *Collocalia francica* is a common visitor and may breed. *Terpsiphone bourbonnensis* occupies exotic *Tabebuia pallida* forest as well as native vegetation, but is probably declining (3–20 pairs in 1993).

#### Key species

A1	<i>Falco punctatus</i>	<i>Hypsipetes olivaceus</i>
	<i>Collocalia francica</i>	
A2 (102)	Mauritius EBA: Five of the 10 species of this EBA have been recorded at this site; see Table 2.	

#### Other threatened/endemic wildlife

Endemic plant communities, all rich in rare and endemic species: dry evergreen lowland forest (near the coast in the south); mixed montane forest (on the upper slopes); evergreen bushland and thicket (small area). Plant species: many endemic, several very rare, some known only from this site. Mammals: *Pteropus niger* (VU, endemic). Reptiles: *Phelsuma guimbeui*, *Phelsuma cepediana* (endemic).

#### Conservation issues

The area is outside the Black River Gorges National Park, but the forest is protected in a Mountain Reserve, which forms a continuous strip covering all of the native vegetation of Piton du Fouge and Piton Canot. The Mountain Reserve extends north to include Black River Peak, on the 'Southern slopes' IBA (MU002). Threats are typical of Mauritian forests: invasion by exotic plants (the creeper *Hiptage benghalensis* is a particular problem in the dry forest at this site), high densities of deer *Cervus timorensis* and other exotic herbivores, and mammalian nest-predators.

#### Further reading

Cheke (1987a,b), Safford (1997a,b)

### Southern slopes

Admin region Savanne, Black River  
Coordinates 20°25'S 57°26'E  
Area 6,270 ha  
Altitude 20–824 m

MU002

A1, A2 (102)  
National Park,  
Mountain Reserve

#### Site description

The major block of 4,000 ha of native forest in south-west Mauritius that lies to the south and west of the Black River Gorge system is included in this site, together with adjacent exotic vegetation.

Physically, the site comprises the south-facing escarpment leading from the southern coastal lowlands to the central plateau, between the Rivière Savanne at Combo in the east and the village of Chamarel in the west, and also the following linked areas: at the top of the escarpment, Plaine Champagne and Black River Peak; the Black River Gorge system west of the Rivière Noire and Grandes Gorges River; and the southern part of the Bois Sec Basin (but the isolated Bois Sec Nature Reserve is included in IBA MU004, together with the relict forests of the central plateau). Three peaks line the top of the escarpment, from west to east: Black River Peak (824 m, the highest point on Mauritius), Montagne Cocotte (772 m.) and Piton Savanne (704 m). Vegetation is mainly mixed montane forest; this includes cloud-forest on Montagne Cocotte (the wettest site on Mauritius: 5,000 mm of rainfall annually) and rainforest between Piton Savanne and Upper Bel Ombre. Dry evergreen lowland forest occurs in the north and west (as rainfall decreases rapidly westwards), with heterogeneous montane shrubland, bushland and thicket in exposed areas such as Plaine Champagne. Most of the native vegetation is within the Black River Gorges National Park. Much land outside the park is privately-owned, and some is used for deer-hunting.

#### Birds

See Box and Table 2 for key species. All eight threatened and near-threatened native landbird species of Mauritius occur at the site: *Falco punctatus* (30 pairs in 1998), *Columba mayeri* (137 birds in 1998, c.50% of non-captive total population), *Psittacula eques* (visits much of the area and nests in Bel Ombre), *Collocalia francica* (uncommon breeder), *Coracina typica* (120–220 pairs, c.60% of world population, 1993), *Hypsipetes olivaceus* (120–170 pairs, c.50% of world population, 1993), *Zosterops chloronothos* (90–185 pairs, c.70% of world population, 1993), *Foudia rubra* (93–108 pairs, c.90% of world population, 1993). The high proportion of global populations found at this site make it one of the world's most important for threatened bird species. All 10 of the restricted-range species occur at the site, including *Terpsiphone bourbonnensis* (10–30% of world population of race *desolata*, 1993) and *Zosterops borbonicus* (abundant). The native passerines are concentrated on the escarpment between Montagne Cocotte and Piton Savanne. The world population of *Columba mayeri* was, until 1987, restricted to the same area; one of three new populations established by reintroduction since 1987 is also at this site (Bel Ombre). This is also the only breeding site for *Psittacula eques* away from Macchabé–Brise Fer (IBA MU003).

#### Key species

A1	<i>Falco punctatus</i>	<i>Coracina typica</i>
	<i>Columba mayeri</i>	<i>Hypsipetes olivaceus</i>
	<i>Psittacula eques</i>	<i>Zosterops chloronothos</i>
	<i>Collocalia francica</i>	<i>Foudia rubra</i>
A2 (102)	Mauritius EBA: All 10 species of this EBA are found at the site; see Table 2.	

#### Other threatened/endemic wildlife

Endemic plant communities, all rich in rare and endemic species: rainforest (very diverse, largest area on Mauritius at this site); cloud-forest (unique community on Montagne Cocotte—this and rainforest support several plant species known nowhere else; south flank of Cocotte may have the richest and least degraded forest on Mauritius); other mixed montane forest (Black River Peak and Bel Ombre); montane shrubland or bushland and thicket (Plaine Champagne); dry evergreen lowland forest (north and west of Black River Peak). Reptiles: *Phelsuma guimbeui*, *Phelsuma rosagularis*, *Phelsuma cepediana*, *Gongylomorphus fontenayi* (all endemic). Mammals: *Pteropus niger* (VU), *Mormopterus acetabulosus* (VU).

#### Conservation issues

Most of the native vegetation is protected by the Black River Gorges National Park. However, an area critical for native wildlife (the Mountain Reserve on the south-facing slope between Montagne Cocotte and Piton Savanne, including Bassin Blanc Crater Lake) is excluded. The native forest of the western slopes of Black River Peak is also in the Mountain Reserve. Small groves (most a few hectares) of exotic plantation trees surrounded by native forest are of vital importance for native birds (especially *Foudia rubra*), as they support

higher nesting success than surrounding native forest. These include the 6 ha grove of Japanese Red Cedar *Cryptomeria japonica* near Piton Savanne, which supported all wild breeding by *Columba mayeri* until reintroduced populations were established elsewhere. The worst invasive weeds are *Psidium cattleianum* and *Ligustrum robustum*. The vegetation of the most bird-rich areas is severely degraded, and exotic animals including mammalian nest-predators abound. Management and reintroduction programmes are or have been taking place for non-passerine birds, and areas of native vegetation selected for intensive management and rehabilitation, benefiting all wildlife.

#### Further reading

Cheke (1987a,b), Jones (1987), Jones *et al.* (1995), Jones and Hartley (1995), Safford (1991, 1997a,b,c).

### Macchabé–Brise Fer forest

Admin region Black River, Plaine Wilhems

Coordinates 20°22'S 57°26'E

Area 3,780 ha

Altitude 20–670 m

MU003

A1, A2 (102)

National Park, Nature Reserve,  
Mountain Reserve

#### Site description

The site contains the major block of 1,260 ha of native forest in south-west Mauritius that lies to the north of the Black River Gorge system, together with adjacent exotic vegetation. The site includes the plateau above the gorge (Pétrin to Tamarin Falls); the gorge itself east of the Rivière Noire and Grandes Gorges river (including the ridges of Macchabé and Brise Fer); the west-facing Magenta escarpment; and Tamarin Gorge to Rempart mountain. The plateau areas are 550–660 m above sea-level, and the escarpments and gorge slope down almost to sea-level; the highest point, Rempart, reaches 777 m. Rainfall decreases from east to west, from 3,500 mm annually at Pétrin to below 1,500 mm on the coastal plain. Diverse types of native upland and lowland forest and thicket are present, together with a large expanse of exotic vegetation, especially around the entrance to the Black River Gorge. Most of the native vegetation is within the Black River Gorges National Park. Land outside the park is mainly privately-owned Mountain Reserve or leased State Land, some of which is used for deer-hunting.

#### Birds

See Box and Table 2 for key species. All eight threatened or near-threatened native landbird species of Mauritius are present. The site is particularly important for *Columba mayeri* (reintroduction programme at Brise Fer since 1987, population increasing to 98 birds in 1998, 34% of non-captive population), *Psittacula eques* (Macchabé–Brise Fer supports majority of wild population of 59–73 birds supplemented by reintroductions from captivity) and *Coracina typica* (c.90 pairs, 35% of world population, 1993). Other threatened species have less important, more localized populations here: *Falco punctatus* (present in all gorge, mountain and escarpment areas, minimum 31 pairs, 1998), *Collocalia francica* (uncommon breeder), *Hypsipetes olivaceus* (c.30 pairs, 10% of world population, 1993), *Zosterops chloronothos* (6–12 pairs, humid scrub only, 1993), *Foudia rubra* (5 pairs, 1993). All 10 restricted-range species occur at the site.

#### Key species

A1	<i>Falco punctatus</i>	<i>Coracina typica</i>
	<i>Columba mayeri</i>	<i>Hypsipetes olivaceus</i>
	<i>Psittacula eques</i>	<i>Zosterops chloronothos</i>
	<i>Collocalia francica</i>	<i>Foudia rubra</i>
A2 (102)	Mauritius EBA: All 10 species of this EBA have been recorded at this site; see Table 2.	

#### Other threatened/endemic wildlife

Endemic plant communities, all rich in rare and endemic species: mixed montane forest (widespread—Brise Fer has one of the finest surviving areas); montane scrubland, bushland and thicket (Mare Longue Plateau; includes very rare heath and *Pandanus* marsh communities at Pétrin); dry evergreen lowland forest (Magenta escarpment to Trois Mamelles); evergreen bushland and thicket (Trois Mamelles). Reptiles: *Phelsuma guimbeaui*, *Phelsuma rosagularis*, *Phelsuma cepedianae* (endemic), *Gongylomorphus fontenayi* (stronghold for this endemic). Mammals: *Pteropus niger* (VU), *Mormopterus acetabulosus* (VU).

#### Conservation issues

The Black River Gorges National Park expanded the previous Macchabé–Bel Ombre Nature Reserve, including most of the native vegetation in this area, and also the exotic forest of the Black River Gorges system. It does not extend far north of Brise Fer, and therefore excludes the Magenta Scarp, Trois Mamelles and Rempart. However, Cabinet Nature Reserve (18 ha) and also the privately-owned Mondrain reserve (5 ha) are in this area; both are important for plants. Part of the Magenta scarp is also a Mountain Reserve. The area is a focus for intensive research and conservation efforts. A study plot established in the 1930s by Vaughan was re-established in 1986 and has been the subject of detailed studies on the changes in the forest, especially invasion by exotics. Early work to conserve *Falco punctatus* and *Columba mayeri* was concentrated in and around the Black River Gorges and Brise Fer forest, and pioneering techniques were developed there; the effort is continuing, extended now to *Psittacula eques*. Several intensive wildlife management areas exist, including (from 1994–1998) the largest on Mauritius, at Brise Fer, where c.27 ha was fenced (to exclude deer and pigs), weeded (to remove exotic plants), and predators were controlled. These areas are critically important for native wildlife.

#### Further reading

Cheke (1987a,b), Jones (1987), Jones and Duffy (1993), Jones *et al.* (1992, 1995), Safford (1997a,b,c).

### Relict forests of central plateau

Admin region Plaine Wilhems, Moka, Grand Port

Coordinates 20°21'S 57°32'E

Area 580 ha

Altitude 350–700 m

A1, A2 (102)

Nature Reserves, Unprotected

MU004

#### Site description

The site includes patches of native vegetation, covering up to 210 ha, scattered over the southern part of the central plateau (350–700 m). They are either isolated mountain peaks unsuitable for forestry (Piton du Milieu, Montagne Lagrave, Montagne Laselle, Montagne d'Hauvillard, Kanaka Crater); areas saved from clearance because of botanical importance (Bois Sec, Les Mares, Gouly Père, Perrier); or areas saved for reasons not documented (Rivière du Poste, Jouanis, Monvert). The whole region is very humid and various native plant communities are represented, as well as spectacular landscapes such as the exposed volcanic plug of Piton du Milieu and the very sharp ridge of Montagne Laselle. Ranching and hunting of deer are limited to a few of the patches. Several patches are reserves. The native forest of State Land Monvert and Montagne Lagrave is fenced.

#### Birds

See Box and Table 2 for key species. Seven threatened or near-threatened species are present, with important populations of three: *Hypsipetes olivaceus* (widespread at very low density in native and sporadically exotic forest 15–24 pairs, 1993); *Zosterops chloronothos* (exploits small areas of suitable habitat, but not known east of Montagne Lagrave, 30–70 pairs, 1993), *Foudia rubra* (Grand Bassin and Rivière du Poste only, 6–7 pairs, 1993). Of the remaining threatened/near-threatened species *Psittacula eques* is a rare non-breeding visitor (probably visits only when preferred food-plants are fruiting), *Collocalia francica* is probably an uncommon breeder, *Coracina typica* (Bois Sec and Grand Bassin only, disappeared from remoter patches since 1975, 4–6 pairs, 1993). The eight restricted-range species at the site include *Terpsiphone bourbonnensis* (small numbers, also in exotic river valley vegetation, 6–30 pairs, 1993) and *Zosterops borbonicus* (abundant). The site's importance for birds is disproportionate to its small area. The richest native bird communities were (in 1993) found in patches nearest the main south-western forest block ('Southern slopes' IBA, MU002). It is the main area for the near-threatened exotic *Anas melleri* on Mauritius (small, introduced population, especially near Piton du Milieu).

#### Key species

A1	<i>Anas melleri</i>	<i>Hypsipetes olivaceus</i>
	<i>Psittacula eques</i>	<i>Zosterops chloronothos</i>
	<i>Collocalia francica</i>	<i>Foudia rubra</i>
	<i>Coracina typica</i>	
A2 (102)	Mauritius EBA: Eight of the 10 species of this EBA have been recorded at this site; see Table 2.	

### ■ Other threatened/endemic wildlife

Endemic plant communities, all rich in rare and endemic species: cloud-forest (on Montagne Lagrave, highest native pteridophyte diversity in Mauritius); rainforest; other mixed montane forest (at Perrier, finest ‘*Sideroxylon* formation’); montane shrubland (on Montagne Laselle, very rare heath community). Many extremely rare plants are known from these sites (in several cases, only one site), for example *Tectiphiala ferox* (monotypic palm genus, E). Reptiles: *Phelsuma rosagularis*, *Phelsuma cepediana* (endemic). Mammals: *Pteropus niger* (VU), *Mormopterus acetabulosus* (VU).

### ■ Conservation issues

Three Nature Reserves—Les Mares (5.1 ha), Gouly Père (10.9 ha) and Bois Sec (5.9 ha)—are strictly protected, although isolated from each other and from the National Park by exotic vegetation; all three contain threatened birds. Surrounding forestry areas are privately leased for deer-hunting, providing further protection. Perrier Nature Reserve (1.5 ha) is too small and isolated to be of importance to birds, and the small size of most patches makes several native bird populations of doubtful viability (especially *Coracina typica* and *Foudia rubra*). The usual invasive plant and mammal species cause problems; the Montagne Lagrave area is especially infested with traveller’s palm *Ravenala madagascariensis*. Deer-ranching and -hunting affects Piton du Milieu, Rivière du Poste, and Jouanis, possibly also Laselle.

### ■ Further reading

Cheke (1987a,b), Jones (1987), Safford (1991, 1993a, 1997a,b).

#### East coast mountains

Admin region Grand Port, Flacq

Coordinates 20°18’S 57°42’E

Area 4,400 ha Altitude 100–626 m Mountain Reserves, Unprotected

MU005

A1, A2 (102)

### ■ Site description

The site comprises three parallel, mountainous chains of very unequal size in the centre-east and south-east of Mauritius, separated by agricultural land (which is excluded from the site). All three chains are forested, and cliffs are rare. The Bambous (or Grand Port) Range is the highest and most extensive. It is dominated by a 12 km long ridge (east–west), with southward-pointing spurs, between Montagne Chat in the east and Montagne Table à Perrot in the west. Other important peaks are Montagne des Créoles (369 m), Montagne Lion (480 m), Pic Grand Fond (521 m) and Montagne Bambou (626 m, the highest). The Bambous Range contains around 2,600 ha of native vegetation, surrounded by a belt of exotic forest. Around 5 km to the north lies Montagne Blanche (7 km long, highest point 532 m, containing 200 ha of native forest), with Montagne Fayence 2.5 km beyond that (4 km long, highest point 433 m, containing 120 ha of native forest). The vegetation is varied, with some excellent stands of mixed montane forest in parts of the Bambous Range, but dominated by exotics in the more humid parts. Small areas of dry evergreen lowland forest exist in the far east. Deer-ranching and -hunting take place in much of the area, and nature-tourism enterprises operate locally. The upper parts of the mountains are little-disturbed.

### ■ Birds

See Box and Table 2 for key species. The Bambous Range contains a large (by Mauritian standards) area of habitat of great importance for *Falco punctatus* (successfully reintroduced in 1987; minimum 43 pairs, 1998) and *Hypsipetes olivaceus* (c.100 pairs, 35% of world population, 1993) and two more restricted-range species: *Collocalia francica* (probably an uncommon breeder) and *Zosterops borbonicus* (abundant). In 1997, Montagne Blanche and Montagne Fayence lacked the two threatened species, but *F. punctatus* is likely to colonize and *H. olivaceus* may wander there. *Zosterops chloronothos* is not resident, but occurs nearby on Montagne Lagrave (in the ‘Relict forests of the central plateau’ IBA, MU004) and so might wander to the western Bambous Range.

#### Key species

A1 *Falco punctatus* *Hypsipetes olivaceus*

*Collocalia francica*

A2 (102) Mauritius EBA: Four of the 10 species of this EBA have been recorded at this site; see Table 2.

### ■ Other threatened/endemic wildlife

Endemic plant communities, all rich in rare and endemic species: mixed montane forest (widespread; Bambous Range contains some of the least-invaded wet forest on Mauritius); dry evergreen lowland forest (localized in east). Mammals: *Pteropus niger* (VU). Reptiles: *Phelsuma rosagularis*, *Phelsuma cepediana* (endemic).

### ■ Conservation issues

Small Mountain Reserves exist on parts of the Bambous Range, most of Montagne Blanche, and about one third of Montagne Fayence. The remaining areas are State Land and under no threat of clearance. However, threats are typical of Mauritian forests: invasion by exotic plants (*Ravenala madagascariensis* is particularly abundant in humid areas at this site), high densities of deer and other exotic herbivores, and mammalian nest-predators. Most of the area is used for hunting, and construction of tracks and clearings has caused more forest loss and soil erosion than most other parts of Mauritius. Nature tourism is being promoted, but this is focused as much on exotic mammals (especially deer and monkeys) as on native wildlife. The Bambous Mountains were the site of the first major reintroduction of *Falco punctatus* to areas where it had been extirpated, probably by organochlorine pesticide-use. The population is still increasing and expanding its range rapidly. *Coracina typica* may have disappeared locally for the same reason, and so its reintroduction may also be feasible.

### ■ Further reading

Cheke (1987a,b), Jones (1987), Jones *et al.* (1995), Safford (1997a,b), Safford and Jones (1997).

#### Plaine des Roches

Admin region Flacq

Coordinates 20°08’S 57°43’E

Area 1,200 ha Altitude 0–5 m

MU006

A1, A2 (102)

Unprotected

### ■ Site description

Plaine des Roches is a flat area of young lava, with many caves (lava tubes) in the hot, dry lowlands of the north-east coast of Mauritius. The volcanic rock is poorly weathered and the ground extremely boulder-strewn, making the area difficult to cultivate. Most of the plain supports scrubby exotic vegetation, mostly stunted *Eucalyptus tereticornis*. However, one portion covering 260 ha—State Land Bras d’Eau—includes 160 ha of other exotic plantation species (in addition to 100 ha of *Eucalyptus*), which are taller and more shade-bearing, and include several species rarely planted away from this site. These species are planted in blocks of a few hectares, most of which are dominated by one tree species. The commonest are two *Araucaria* species, but other broadleaved species include *Tabebuia pallida*, *Swietenia mahagoni*, *Cordia alliodora*, *Cassia fistula* and fruit trees, especially mango *Mangifera indica*. Most of the Plaine supports few, if any, human uses. State Land Bras d’Eau is managed by the Forest Service as a plantation.

### ■ Birds

See Box and Table 2 for key species. The Plaine des Roches is by far the most important site on Mauritius for the restricted-range species *Terpsiphone bourbonnensis* (Mauritian endemic subspecies *desolata*). Other *desolata* populations may have declined by 50% over the last 20 years, but the population on the Plaine des Roches appears not to have changed (c.78 pairs, 30–90% of population, 1993). This population is restricted to the 160 ha of shade-bearing exotics at Bras d’Eau. The area is also very important for the cave-nesting *Collocalia francica* (at least 17 colonies of less than 50 nests each, in lava tubes, 1990s).

#### Key species

A1 *Collocalia francica*

A2 (102) Mauritius EBA: Three of the 10 species of this EBA have been recorded at this site; see Table 2.

### ■ Other threatened/endemic wildlife

Little native wildlife occurs. Native plant communities: dry evergreen thicket of littoral zone (less disturbed than usual on Mauritius); fresh

or brackish water pools (rare, poorly known habitat). Reptiles: *Phelsuma cepediana* (endemic). Mammals: *Mormopterus acetabulosus* (VU).

#### ■ Conservation issues

No reserve exists, but management of Bras d'Eau by the Forestry Service takes full account of its importance to *Terpsiphone bourbonnensis*. The key to the importance of Bras d'Eau for *Terpsiphone bourbonnensis* may be the habitat structure, a scarcity of introduced nest-predators such as *Macaca fascicularis*, and abundance of mosquitoes. *Collocalia* nesting caves around the town of Roches Noires suffer continuing disturbance, including clothes-washing, gambling, vandalism and black-magic ceremonies. Plans for a new international airport on the Plaine des Roches have been aired, but the plan appears to have been abandoned.

#### ■ Further reading

Cheke (1975, 1987a,b), Safford (1994, 1997d), Sooknah (undated).

### Pont Bon Dieu

Admin region Flacq

Coordinates 20°09'S 57°38'E

Area 10 ha Altitude 280 m

MU007

A1, A2 (102)

Unprotected

#### ■ Site description

Pont Bon Dieu is a complex of underground lava tubes, forming caves, in the lowlands of central-north Mauritius. The site is made accessible by subsidence of the roof in two areas; a natural bridge (crossed by a road) remains between the two holes, giving the site its name. The openings are up to 300 m across and 20 m deep. The important parts of the system for wildlife are the interiors of the caves, which are unvegetated. Openings are filled with thickets, mainly of exotic species. The surrounding land is sugar-cane.

#### ■ Birds

See Box and Table 2 for key species. The site is home to the largest known nesting colony of *Collocalia francica* (100–1,000 pairs). *Phaethon lepturus* also nests at the site.

#### Key species

A1 *Collocalia francica*

A2 (102) Mauritius EBA: Two of the 10 species of this EBA have been recorded at the site; see Table 2.

#### ■ Other threatened/endemic wildlife

Reptiles: *Phelsuma cepediana* (endemic). Mammals: *Mormopterus acetabulosus* (VU; large numbers).

#### ■ Conservation issues

The site is unprotected and has suffered from direct persecution (vandalism), collection of nests for medicinal use or cooking, and dumping of rubbish, which is made possible by the road that approaches the lip of the opening and has at times completely blocked cave entrances. These threats have been countered by a public-awareness campaign and by work parties removing rubbish.

#### ■ Further reading

None known to BirdLife International.

### Moka mountains

Admin region Moka, Port Louis, Pamplemousses

Coordinates 20°11'S 57°31'E

Area 2,100 ha

Altitude 20–823 m

MU008

A1, A2 (102)

Nature Reserve,

Mountain Reserve, Unprotected

#### ■ Site description

The site is a rugged and spectacular mountain chain above the city of Port Louis in north-west Mauritius. The main ridge runs approximately east to west, and three long spurs extend northwards. Major peaks are Pieter Both (823 m), Le Pouce (812 m) and Montagne Ory (c.700 m). The area is much drier than the south-western and

eastern forests, most receiving around 1,000–2,000 mm rainfall annually. However, the highest peaks receive extra moisture from cloud, resulting in the presence of native cloud-forest on Le Pouce. This is the only area of native vegetation of significant size, although native plants are scattered throughout the range. Exotic vegetation dominates—most is scrub, but grassland, *Eucalyptus* plantations and cliffs also occur. Deer-stocking and wildlife tourism (focused mainly on exotic animals) take place in Domaine Les Pailles, in Anse Courtois, and open access areas are popular for recreation.

#### ■ Birds

See Box and Table 2 for key species. Reintroduction of *Falco punctatus* took place successfully in the early 1990s, mainly in the Anse Courtois valley. The birds are expected to spread to occupy much of the Moka Range. *Collocalia francica* is also present (probably uncommon breeder), while a population of the restricted-range *Terpsiphone bourbonnensis* appears to have become extinct since 1975.

#### Key species

A1 *Falco punctatus*

*Collocalia francica*

A2 (102) Mauritius EBA: Three of the 10 species of this EBA occur at the site; see Table 2.

#### ■ Other threatened/endemic wildlife

Plant communities: mixed montane forest on Le Pouce is cloud-forest, with several critically endangered species. Other endemic plants: several known from single sites elsewhere in Moka Mountains. Reptiles: *Phelsuma guimbeaui*, *Phelsuma cepediana* (endemic). Mammals: *Mormopterus acetabulosus* (VU) probable.

#### ■ Conservation issues

Le Pouce Nature Reserve protects the cloud-forest, and the Moka Mountain Reserves protect the watershed above Port Louis and Notre-Dame. These reserves are not of particular significance for *Falco punctatus*, although this species is likely to occur there. No threats are apparent to the *Falco punctatus* population, which does not necessarily need native vegetation.

#### ■ Further reading

Cheke (1987a,b), Jones (1987), Jones *et al.* (1995), Safford (1997a).

### Ile aux Aigrettes

Admin region Grand Port

Coordinates 20°25'S 57°44'E

Area 27 ha Altitude 0–12 m

MU009

A1, A2 (102)

Nature Reserve

#### ■ Site description

The site is a roughly circular, calcarenitic islet in Grand Port Bay, 900 m from the south-east mainland of Mauritius. It is a remnant of a Pleistocene reef, which emerged around 30,000 years ago when the sea-level dropped, and lies in the dry zone of Mauritius, receiving around 1,400 mm of rain annually. The islet is classified as a Nature Reserve because of the presence of a dry evergreen lowland forest with a unique species composition, and an excellent opportunity for ecological restoration. Another eight islets in Grand Port Bay (near Ile aux Aigrettes) each cover less than 3 ha.

#### ■ Birds

See Box and Table 2 for key species. Threatened species: *Falco punctatus* (used as reintroduction site for 'East coast mountains' IBA, MU005; one pair has bred); *Columba mayeri* (reintroduced since 1993, 54 birds in 1998, 19% of non-captive population). The islet is one of the most promising sites in Mauritius for marooning other native landbird species. Establishment of seabird populations is also a possibility. Other Grand Port Bay islets have a few nesting *Puffinus pacificus* and their importance to seabirds could increase in future, with appropriate management, although population sizes cannot be predicted.

#### Key species

A1 *Falco punctatus*

*Columba mayeri*

A2 (102) Mauritius EBA: Two of the 10 species of this EBA occur at the site; see Table 2.

### ■ Other threatened/endemic wildlife

Plant communities: dry evergreen lowland forest, rich in ebonies *Diospyros aigrettarum* (habitat otherwise extinct, but probably typical of the eastern lowlands of Mauritius). Plant species: around 18 threatened species present, with more being introduced from mainland or other islets; several almost restricted to islet. Mammals: *Pteropus niger* (VU; occasional visitor). Reptiles: *Gongylomorphus bojerii*, *Nactus coindemirensis* (both endemic to Mauritian islets) on nearby islets (not Ile aux Aigrettes).

### ■ Conservation issues

Declared a Nature Reserve in 1965, but privately leased until 1975. After this, degradation (wood-cutting) accelerated until employment of local watchmen brought about improved protection in 1985. In 1987, a lease (which now extends to 2036) was granted to the Mauritius Wildlife Foundation, who have prepared a management plan. Intensive management then began, with the aim of rehabilitating a self-sustaining indigenous ecosystem. The plan includes habitat restoration and species recovery programmes (including introduction of native plant and animal species and eradication of exotics), research, training, education and ecotourism. Up to 1997, activities included removal of exotic weeds, eradication of cats and *Rattus rattus*, construction of nursery and lodgings for full-time wardens, introduction of two bird and 25 plant species (all native), and organization of supervised tourist visits. Threats to native ecosystems are posed by exotic plants (especially *Leucaena leucocephala*, *Flacourtia indica* and *Litsea glutinosa*) and animals (especially shrews *Suncus murinus*, five species of reptiles including the snake *Lycodon aulicum*, and Giant Land-Snails *Achatina* spp.). The management plan also emphasizes the need for vigilance against reinvasion by rats, trampling by visitors, coastline erosion and fire. Any translocated landbird populations would be vulnerable to the impact of cyclones.

### ■ Further reading

Bell *et al.* (1994), Dulloo *et al.* (1997), Jones (1996), Jones *et al.* (1995), Mauritius Wildlife Appeal Fund (1988, 1989, 1992), Parnell *et al.* (1989), Safford and Jones (1998).

### Gunner's Quoin

Admin region Outer Islets  
Coordinates 19°56'S 57°37'E  
Area 65 ha Altitude 0–163 m

**MU010**

 A1  
Nature Reserve

### ■ Site description

Also known as Coin de Mire, this site is the closest to the mainland (8 km) of the five northern islets of Mauritius; some publications give its area as 76 ha. It is a basaltic or tuff island, largely encircled by cliffs. The eastern side is low and flat, while a central ridge encircles a valley and joins the summit ridge that runs across the western end. The vegetation is heavily modified and dominated by exotics; most is presently exotic thorn scrub, grassland and cliff. The islet is visited by local people for recreation, hunting exotic hares *Lepus nigricollis* and poaching seabirds. Catholic and Hindu shrines are present. Most tourists visit the reefs offshore, but few the land. The islet is named for its shape, like a wedge used by gunners to hold field guns in place.

### ■ Birds

See Box for key species. No threatened or restricted-range bird species are present, but the site is included because of its high potential for rehabilitation and exotic mammal eradication, a process that has already begun. Small numbers of *Phaethon rubricauda*, *P. lepturus* and *Puffinus pacificus* nest; rehabilitation could allow large population increases and perhaps also establishment of other species including *Pterodroma arminjoniana*.

#### Key species

A1 Threatened native landbird species may be introduced as rehabilitation proceeds.

### ■ Other threatened/endemic wildlife

Plants: rare, endemic plant species characteristic of the northern islets include *Lomatophyllum tormentorii* (stronghold for this species, E), *Latania loddigesii* (palm, E), *Pandanus vandermeerschii* (V), *Dracaena*

*concinna* (other populations on Round Island—where introduced—and Ile aux Aigrettes, E). Reptiles: *Nactus coindemirensis*, *Gongylomorphus bojerii* (endemic to Mauritian islets).

### ■ Conservation issues

Ecological surveys were carried out in 1982, when the gecko *Nactus coindemirensis* was discovered. In 1993, active plans for ecological rehabilitation began, including eradication of problem animals and marooning of native vertebrates (including birds). In 1995, *Rattus norvegicus* was eradicated (*Rattus rattus* was not present); *Lepus nigricollis* was reduced, but not eradicated. Problem weeds are *Flacourtia indica*, *Lantana camara*, *Cordia curassavica* and *Opuntia vulgaris*. Additional threats to native wildlife (including any species marooned in future) include invasion by exotic animals (especially rats) and new exotic plants, poaching (for seabirds; still a serious problem in 1995), cyclones and possibly diseases.

### ■ Further reading

Bell *et al.* (1994), Bell and Bell (1996), Bullock (1986), Safford and Jones (1998).

### Flat and Gabriel Islands

Admin region Outer Islets  
Coordinates 19°52'S 57°39'E  
Area 295 ha Altitude 0–95 m

**MU011**

 A1  
Nature Reserve

### ■ Site description

Two of the five northern islets of Mauritius, here considered together as they lie only 700 m apart, but are 6.5 km from other islets. Both are comprised of coralline sand on basalt lava-flows. Gabriel (42 ha) is a flat islet, with semi-stabilized dunes and a small area of raised coral, but no cliffs. Vegetation is open scrub or grassland. Flat Island (253 ha, the largest of the northern islets) is also mostly flat, but has a single hill topped by a lighthouse. The vegetation is heavily modified, mostly scrub and grassland dominated by exotics. North of Flat Island is Pigeon Rock, a spectacular bare rock stack, used by resting, and perhaps occasionally nesting, seabirds. The islands are visited by local people for recreation (up to 200 per day in 1993), fishing (often camping overnight) and poaching seabirds. More tourists visit the reefs offshore, but few venture far on land. The lighthouse station on Flat Island is abandoned, as are the other buildings and tracks, which date from when the island was used as an isolation area for cholera sufferers and an animal quarantine station.

### ■ Birds

See Box for key species. No threatened or restricted-range bird species are present, but the site is included because of its high potential for rehabilitation and exotic mammal eradication. *Phaethon lepturus* and *Puffinus pacificus* nest on both islands (at least 250 pairs of *P. pacificus* in 1993), and also *Phaethon rubricauda* on Flat Island; rehabilitation could allow large population increases and perhaps also establishment of other species, such as *Pterodroma arminjoniana*.

#### Key species

A1 Threatened native landbird species may be introduced as rehabilitation proceeds.

### ■ Other threatened/endemic wildlife

Plants: *Psiadia arguta* (Gabriel; R), *Latania loddigesii* (E) and *Pandanus vandermeerschii* (both islets; V); 60% of plant species recorded on Gabriel Island are native. Reptiles: *Gongylomorphus bojerii* (both islets; endemic to Mauritian islets), *Nactus coindemirensis* (Pigeon Rock only).

### ■ Conservation issues

Both islets are reserves, but attracted little attention until 1993, when recommendations were made for a multi-use management policy, including wildlife conservation through weed control, predator eradication, translocation of birds and reptiles, revegetation and habitat and site manipulation. Problem weeds are *Lantana camara*, *Opuntia vulgaris*, *Leucaena leucocephala*, *Desmanthus virgatus* and *Furcraea foetida*. *Rattus rattus* is (1998) abundant on both islands (despite an eradication attempt on Gabriel Island in 1995), while Flat Island also has *Mus musculus* and cats. Additional threats to native wildlife (including any species marooned in future) are similar to those

on Gunner's Quoin: invasion by exotic animals and plants (including reinvasion after eradication), poaching (for seabirds), cyclones and possibly diseases.

#### Further reading

Bell *et al.* (1994), Safford and Jones (1998).

### Round Island

Admin region Outer Islets

Coordinates 19°51'S 57°47'E

Area 169 ha Altitude 0–276 m

MU012

A1, A4ii, A4iii  
Nature Reserve

#### Site description

The most famous of the five northern islets of Mauritius, containing the last populations of several taxa extinct elsewhere, because it lacks rodents (and is one of the largest of all rodent-free tropical, high islands). It is a semicircular islet (rather than as its name suggests) composed of beds of welded tuff, with very steep slopes. Much of the islet is devoid of soil, because of weathering from wind and water, exacerbated by browsing and grazing by exotic mammals (goats and rabbits *Oryctolagus cuniculus*). Bare rock areas have been sculpted into numerous overhangs, small caves and pedestals. The vegetation is the sole relict (albeit highly degraded) of the palm-savanna that formerly dominated the coastal areas of northern and western Mauritius. The vegetation includes many exotic species, but eradication (in the 1980s) of goats and rabbits has resulted in radical increases in regeneration and survival of native and exotic plants. The islet is a Nature Reserve and access is strictly forbidden to all but authorized researchers and management staff.

#### Birds

See Box for key species. The islet supports large numbers of seabirds, mostly burrow-nesting *Puffinus pacificus*. Also present is the entire Afrotropical and Indian Ocean breeding population of a *Pterodroma* petrel presently attributed to *P. arminjoniana* (but see 'Comments on the inventory'). Other procellariid species recently confirmed in small numbers on Round Island (with evidence of breeding, attempted breeding or occupation of nest-sites typical of the species elsewhere) are *Pterodroma baraui*, *P. nigripennis*, *Puffinus lherminieri*, *P. assimilis*, *P. carneipes* and *Bulweria bulwerii*; *Bulweria* was nesting and *P. nigripennis* (two pairs, trapped) were in burrows, but the occasional visits by one or two *P. baraui* do not indicate that a permanent population is present. The site has the largest colony of both *Phaethon rubricauda* and *P. lepturus* in the Mascarenes.

#### Key species

A1	Threatened native landbird species may be introduced as rehabilitation proceeds.		
A4ii		Breeding (pairs)	Non-breeding
	<i>Pterodroma arminjoniana</i>	400+	—
	<i>Puffinus pacificus</i>	50,000	—
	<i>Phaethon rubricauda</i>	500–700	—
	<i>Phaethon lepturus</i>	500–1,000	—
A4iii	More than 10,000 pairs of seabirds have been recorded at this site.		

#### Other threatened/endemic wildlife

Plant community: Mauritian palm-savanna (only site). Plant species: many rare species including *Latania loddigesii*, *Dictyosperma album* var. *conjugatum*, *Hyophorbe lagenicaulis* (palms, latter two confined to Round Island), *Lomatophyllum tormentorii* (all E), *Pandanus vandermeerschii* (R). Reptiles: *Phelsuma guentheri* (E), *Leiopisma telfairi* (V), *Casarea dussumieri* (E), *Nactus serpensinsula* (V), *Gongylomorphus bojerii* (endemic to Mauritian islets). The first three are restricted to Round Island, and a fourth such species, *Bolyeria multocarinata*, is now probably extinct (last recorded in 1975). *Nactus serpensinsula* is otherwise known only from Serpent Island (IBA MU013), where a different race occurs. There are several invertebrates endemic to Round Island, for example, the centipede *Scolopendra abnormis* (VU) and the scale-insect *Asterolecianum dictyospermae* (Homoptera), the latter known exclusively from one of the two surviving *Dictyosperma* palms, both of which are on Round Island. In view of such cases, Round Island has been described as having more threatened species per unit area than any other land area in the world.

#### Conservation issues

Round Island is a site of intensive and continuous conservation management and research; a management plan was produced for the island in 1989. Main activities have included: designation as a Nature Reserve, eradication of goats and rabbits (the only exotic mammals), monitoring of changes following these eradications and accompanying rehabilitation actions, weeding of exotic plants, planting out native Round Island species, and introduction of endangered plants from elsewhere. The major threat is increasing domination by exotic plants, especially *Cenchrus echinatus* and *Achyranthes aspera*. *Desmodium incanum* and *Desmanthus virgatus*, until recently the worst weeds, were under control by 1998. Colonization by rats or other mammals would be disastrous. Poaching of seabirds seems no longer to be a serious problem. Fire is a possible threat as vegetation cover increases. Rehabilitation of the native palm-savanna is the highest management priority and it may be many years before the islet could support native landbirds (if ever). Any translocation programme for such birds would need especially careful assessment of likely effects on all other wildlife.

#### Further reading

Bell *et al.* (1994), Bullock (1986), Cheke (1987a), Merton *et al.* (1989), North *et al.* (1994), North and Bullock (1986), Safford and Jones (1998), Vinson (1950, 1953).

### Serpent Island

Admin region Outer Islets

Coordinates 19°49'S 57°48'E

Area 31 ha Altitude 0–162 m

MU013

A4i, A4iii  
Nature Reserve

#### Site description

Serpent Island is the most remote and inaccessible of the five northern islets of Mauritius (area given as 19 ha in some publications). The islet is in the shape of a dome (162 m high) with a circular base and extremely steep slopes. The lower slopes are marked by hollows, overhangs and ledges, with low cliffs around the shore, whereas the upper slopes are relatively smooth. Vegetation is almost absent; the three plant species recorded are all rare, although common elsewhere. A thin coating of guano covers the rock surface. Landing is extremely difficult. As on Round Island, exotic rodents have never become established. However, a vast colony of surface-nesting seabirds covers the whole islet and this, combined with the near-absence of vegetation, gives Serpent Island a totally different character. It has an ecosystem of vertebrates and invertebrates, many perhaps endemic to the islet, most living independently of any vegetation.

#### Birds

See box for key species. The seabird colony consists mainly of terns (Sterninae). Populations are very large (estimated totals up to 850,000 pairs), but have never been reliably censused. Around 50 pairs of *Sula dactylatra* (of the scarce Indian Ocean race *melanops*) are also present. Unusually for the region, *Anous tenuirostris* nests on the ground. *Pterodroma arminjoniana* visits from nearby Round Island, but has not been proven to breed. *Phaethon rubricauda* formerly bred and may still do so occasionally. The island has no potential for landbirds.

#### Key species

A4i		Breeding (pairs)	Non-breeding
	<i>Sterna fuscata</i>	250,000–500,000	—
	<i>Anous tenuirostris</i>	10,000–100,000	—
	<i>Anous stolidus</i>	10,000–100,000	—
A4iii	More than 20,000 waterbirds occur regularly at this site.		

#### Other threatened/endemic wildlife

Reptiles: *Nactus serpensinsula* (VU) (islet-endemic subspecies; species otherwise occurs only on Round Island), *Gongylomorphus bojerii* (possibly islet-endemic subspecies). Arachnids: undescribed lizard-eating tarantula *Pterinochilus* sp. (Theraphosidae). Other islet-endemic invertebrates likely to be found.

#### Conservation issues

The islet is a Nature Reserve and access is strictly forbidden to all but authorized researchers. The difficulty of landing on the island has proved its best form of protection (though landing is prohibited

anyway). No rehabilitation is needed, as the island is in a close-to-pristine state, and landbird introductions are not possible. The seabirds are affected by poaching from time to time, although this appears spasmodic. Establishment of rats (if this is possible at such a site) could endanger many species on the island.

#### Further reading

Bell *et al.* (1994), Lloyd (1846), Newton (1960), Safford (1993b), Vinson (1950, 1953).

### Rodrigues mainland

Admin region Rodrigues

Coordinates 19°42'S 63°26'E

Area 5,000 ha

Altitude 0–396 m

MU014

A1, A2 (103)

Nature Reserves, River Reserve, Mountain Reserve, Unprotected

#### Site description

The site covers the central ridge and valleys radiating from it, including most of the native and exotic woody vegetation on Rodrigues. It occupies about one half of the island. The main habitats for native birds are exotic forest and thickets; the forest is dominated by *Tabebuia pallida*, *Mangifera indica*, *Casuarina equisetifolia* and other exotics, and a few native tree species, while most thickets are of exotic *Syzygium jambos*. Such habitat is patchily distributed, mainly in valleys, with the largest stands in the sheltered valleys of Solitude and Cascade Pigeon. Native plants elsewhere are widely scattered, although concentrations occur at a few sites.

#### Birds

See Box and Table 2 for key species. Two species are endemic to the Rodrigues mainland. Populations of both have fluctuated, reaching a low point of less than 10 pairs each following habitat loss and severe cyclones in the late 1960s. However, as woody habitat has recovered and been protected, and in the absence of catastrophic cyclones, their populations have increased. In 1998, the distribution of *Foudia flavicans* included most of the island's woody vegetation taller than 5 m, and is still expanding as new plantations reach maturity. In 1999, the population was 911–1,200 birds and the main sites were Solitude, Cascade Pigeon, Saint Gabriel, Sygangue, Grande Montagne and Mont Malartic. *Acrocephalus rodericanus* is much rarer, but still probably less at risk than for a long time; in 1999, the population was estimated at 150 birds, probably slowly increasing. Its main haunts in 1999 were Solitude, Cascade Pigeon, Montagne Cimetière, St Gabriel, Grande Montagne and Mont Limon. *Pterodroma barau* has also once (1974) been found nesting, but this incidence has not been repeated.

#### Key species

A1 *Acrocephalus rodericanus* *Foudia flavicans*  
 A2 (103) Rodrigues EBA: Both species of this EBA are found at this site; see Table 2.

#### Other threatened/endemic wildlife

Plants: a devastated but still unique flora, with 36–38 taxa of endemic flowering plants (19–21 are Endangered, seven Vulnerable and eight Rare), including *Ramosmania rodriguesiana* (= *R. heterophylla*), *Dombeya rodriguesiana* and *Gouania leguatii*, all known from single individuals; three endemic ferns (one Rare, one Endangered). Mammals: *Pteropus rodricensis* (CR). Molluscs: 10 endemic land-snail species, four highly endangered.

#### Conservation issues

Two localities in the IBA are Nature Reserves for native plants. Much bird habitat is protected watershed (River Reserve or Mountain Reserve), in which human habitation and wood-cutting are prohibited. However, wood-cutting and livestock-grazing still affect some areas. Reforestation and natural regeneration combined with forest protection, spurred by the need for watershed protection in this water-stressed island, has been the key to the recovery of the native birds (and also of the fruit bat *Pteropus rodricensis*); the absence of catastrophic cyclones since 1972 has also helped. However, much reforestation has involved exotic trees, and so this process is not suited to native ecosystem conservation. To this end, sites rich in native plants have been selected for native ecosystem rehabilitation, and it is hoped that native birds will increasingly also occupy these as the native trees

and shrubs mature. Sites are fenced to exclude browsing or grazing animals and wood-cutters; exotic plants are removed and natives replanted. The main sites are Grande Montagne (10.2–13.8 ha) and Anse Quitor (7.7–10.3 ha; areas vary according to source) Nature Reserves, but Cascade Mourouk (proposed reserve), Cascade Pigeon and Cascade Saint Louis are also priorities for future rehabilitation. Management is accompanied by a public-awareness campaign promoting environmental education and wildlife conservation. *Foudia flavicans* and *Pteropus rodricensis* have bred in captivity, but releases have not been needed because of increases in wild populations. Actual and potential (based on the ecological history) threats are habitat destruction and degradation, cyclones and effects (competition and/or predation) of exotic animals, including the possibility of introductions of new exotics.

#### Further reading

Cheke (1979, 1987a,c), Impey (2000), Mauritian Wildlife Appeal Fund (1992), Safford (1992), Showler (1999), Strahm (1989).

### Rodrigues islets

Admin region Rodrigues

Coordinates 19°45'S 63°20'E

Area 180 ha Altitude 0–50 m

MU015

A1, A4iii

Nature Reserves, Unprotected

#### Site description

The site comprises 18 islets of over 1 ha extent (and some smaller stacks or rocks) that lie within the reef that surrounds the mainland of Rodrigues. This account concentrates on the three thought to have the most potential for rehabilitation and subsequent marooning for native Rodriguan birds and increases in seabird populations, based mainly on existing flora and fauna: Ile Cocos, Ile aux Sables and Crab Island. Cocos and Sables (usually reported as covering 14 ha and 8 ha respectively, although possibly larger) are almost identical coralline sand cay islets 1 km apart, about 4 km west of the western tip of Rodrigues. They support a mixture of trees (mainly exotic *Casuarina equisetifolia*), shrubs (especially *Pisonia grandis*), herbs and grasses typical of littoral zones, and are managed for ecological rehabilitation with small-scale controlled tourism (day visits currently only to Cocos). Crab, the largest of the 18 islets (44.5 ha), lies 400 m off the south-west coast of Rodrigues and rises to 50 m. It is partly basaltic and partly coralline, with terraces sloping to the south and east from a high escarpment. Its vegetation is a mixture of grasses, shrubs and trees, including several native (non-littoral) species. It is used as an animal-breeding centre. The other islets support only exotic grassland or scrub, with scattered native plants, on coralline rock or basalt; Frégate (12 ha) has native littoral vegetation and may warrant rehabilitation. Only two other islets (Cat and Gombrani) exceed 10 ha.

#### Birds

See Box for key species. These islets have high potential for rehabilitation, which may include marooning of native landbird species. Cocos and Sables have seabird colonies dominated by *Anous* species; a single census (1998) estimated a total of 10,000–14,000 birds, but the annual total is likely to be much more. The same census revealed less than 1,000 pairs of *A. stolidus* and 4,000–6,000 pairs of *A. tenuirostris*, but ringing evidence suggests that much higher numbers nest during the course of a full year, and numbers may also increase as management continues. In 1998, Cocos and Sables also held *Phaethon lepturus* (a few pairs), *Sterna fuscata* (150 pairs in 1998), and *Gygis alba* (20 pairs); the only population in the Mascarene Islands, while Ile Frégate has a small colony of *Puffinus pacificus*. Cocos and Sables are also the main area on Rodrigues for migratory waders, although no more than 100 birds are generally present.

#### Key species

A1 Threatened native landbird species may be introduced as rehabilitation proceeds.  
 A4iii More than 20,000 waterbirds occur regularly at this site.

#### Other threatened/endemic wildlife

Plants: *Sarcostemma odontolepis* (R), *Terminalia bentzoe rodriguesensis* (V), *Myoporum mauritianum* (E), endemic Rodriguan palms.

### ■ Conservation issues

Cocos and Sables are both Nature Reserves. All Rodrigues islets were assessed in 1993 for rehabilitation potential, and Cocos, Sables and Crab were identified as the highest priorities. Rehabilitation may involve mammal eradication, weed control, translocation of birds and reptiles, revegetation and habitat and site manipulation, accompanied by control of access. Ile aux Sables is closed to visitors; landing there and on Cocos is controlled by the Forestry Division, and a warden is stationed on Cocos. Steps towards rehabilitation taken by 1998 included eradication of *Mus musculus* from Cocos and Sables (leaving these islets mammal-free), partial removal of exotic plants from Cocos and Gombrani, and introduction to Cocos of Rodriguan endemic palms threatened on the Rodrigues mainland by hybridization with Mauritian taxa. Threats or hurdles to rehabilitation remain: Crab has cats, *Mus musculus*, *Rattus rattus* and sheep; other islets have dogs and goats in addition; major problem weeds are *Leucaena leucocephala* and *Lantana camara*; human disturbance threatens the seabird colonies; and native wildlife on islets, especially any landbird populations introduced in future (if this is done), would be vulnerable to cyclones.

### ■ Further reading

Bell *et al.* (1994), Bell and Bell (1996), Jones (1991).

### Cargados Carajos shoals (Saint Brandon)

Admin region Outer Islets

Coordinates 16°35'S 59°36'E

Area 19,000 ha Altitude 0–6 m

MU016

A4i, A4iii  
Unprotected

### ■ Site description

Cargados Carajos is a collection of low islets, coral reefs and sandbanks lying 350 km north-north-east of Mauritius, often called Saint Brandon. The area covers several thousand square kilometres, with a land area greatly affected by tides, but averaging around 300 ha on 18 islets. The shoals arise from a limestone plateau, such that water depth seldom exceeds 20 m. The crescent-shaped reef covers around 19,000 ha, and is 38 km long by 5 km wide, cut by three passes. The algal ridge is possibly the largest in the Indian Ocean. Islets, sandbanks and cays are mainly found on the west side of the crescent; the largest are Raphael, Avoquer, Ile Cocos and Ile du Sud. In addition, to the north and west of the reef lie Ile Frégate, Ile Perle, Ile du Nord and Albatros, of which the latter is the largest (101 ha) and highest (6 m) in the shoals. Typical vegetation is thicket of *Tournefortia argentea* and *Scaevola taccada*, with grasses and other herbs, although *Casuarina equisetifolia*, *Terminalia catappa* and coconut trees occur on a few islands. The seas are very productive and fishing has long been important. The main settlement is on Raphael, comprising a privately-owned commercial fishing station (with a minimum of 35 resident employees), coastguard and meteorological station (with eight residents in 1996). Tiny settlements exist on Avoquer, Cocos and Sud; the settlement on Albatros was abandoned in 1988. Natural resources collected incidentally include nesting sea-turtles (*Chelonia mydas* and *Eretmochelys imbricata*), crustaceans such as lobsters *Panulirus*, *Octopus*, seabirds and their eggs. Visits other than by fishermen or government personnel are very rare.

### ■ Birds

See Box for key species. No landbirds are present, and only small numbers of migrant shorebirds occur. However, Cargados Carajos supports large numbers of seabirds. Estimating populations for single colonies is very difficult, and at this site the multitude of colonies and brevity of visits compounds the problem. The most abundant species is *Sterna fuscata* (although the population has decreased from the 100,000 pairs estimated in 1975), but the numbers of four other tern species (Sterninae) are probably all of global or regional importance. Additional nesting seabird species (all apparently represented by less than 1% of the world population) are *Fregata minor*, *F. ariel*, *Puffinus pacificus* (one colony), *Sula dactylatra* (200 pairs on Ile du Nord in 1971, and still present 1996) and *Phaethon lepturus* (rare, 1996). The *Fregata* species have declined greatly from 1950s populations in the thousands, and *Sula sula* became extinct in the 1960s.

#### Key species

A4i	Breeding (pairs)	Non-breeding
<i>Sterna fuscata</i>	20,000	—
<i>Gygis alba</i>	5,000	—
<i>Sterna dougallii</i>	400	—
<i>Anous tenuirostris</i>	15,000	—
<i>Anous stolidus</i>	4,500	—
A4iii	More than 20,000 waterbirds occur regularly at this site.	

### ■ Other threatened/endemic wildlife

Reptiles: nesting site for the sea-turtles *Chelonia mydas* (EN) and *Eretmochelys imbricata* (CR). Marine life: the coral reef and associated waters are extremely diverse, but the reef structure and coral fauna are largely unknown.

### ■ Conservation issues

The site is not a protected area, but holds impressive seabird populations because of its remoteness and the difficulty of landing on some of the islets. However, resident or visiting personnel are capable of causing immense damage to wildlife by disturbance, over-exploitation or introduction of exotics; seabird populations have declined recently. In the 1970s, harsh living conditions with few diversions for residents was reported to result in persecution of birds as a sport (vandalism) as much as a way of gathering food (eggs and birds). In 1996, persecution by residents was thought to be under control, with the fishing company encouraging conservation of turtles and seabirds, assisted by government and non-governmental organizations. However, leases are not permanent and future lessees' policies may be different. Worse damage seemed to result from raids by the crews of fishing boats of various nationalities, passing en route to or from other fishing banks. Exotic mammals present are cats, rats (only *Rattus rattus* was confirmed in 1996) and mice *Mus musculus*; cats and rats are predators of seabirds, and rats are abundant on at least three islands. Grazing by rabbits *Oryctolagus cuniculus* can alter vegetation and substrate, thereby also affecting seabird populations.

### ■ Further reading

Newton (1960), Staub and Guého (1968), Rowlands (1974), Newlands (1975), Staub (1976), Swinnerton *et al.* (1996), Williams and Rowlands (1980).

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