LA RÉUNION AND ILES EPARSES

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GENERAL INTRODUCTION

Two very distinct territories, Ile de la Réunion, usually (and henceforth) known as La Réunion, and Iles Eparses, are considered in this chapter, because they are both French dependencies in the Malagasy faunal region, and the latter is administered primarily from the former. However, general information is provided below separately.

La Réunion

La Réunion is a mountainous island covering 2,512 km² in the tropical south-west Indian Ocean. It is the westernmost of the Mascarene island chain, a volcanic archipelago which includes two other high islands: Mauritius, 164 km to the east-north-east, and Rodrigues, a further 574 km east. The Mascarenes have never been united or connected to another land mass. The nearest continental neighbour of La Réunion is Madagascar, 600 km west.

The human population was estimated at 682,000 in 1998, growing at 1.3% annually. La Réunion is an overseas Département of France, and is divided into four arrondissements, subdivided into cantons and communes. The head of state is the President of France, represented locally by the Préfet de la Réunion. Local affairs are governed by the Préfecture, Conseil Général and Conseil Régional, all based in the administrative capital, Saint-Denis.

La Réunion is dominated by two overlapping shield volcanoes. The older, extinct one is centred on Piton des Neiges, the highest point in the Mascarene Islands and indeed the whole Malagasy region (3,069 m). This massif has eroded spectacularly into gorges, ridges, and three cirques resembling amphitheatres around 10 km across, but with outlets to the sea formed by gorges a few hundred metres wide. The younger volcano, Piton de la Fournaise (2,631 m), is still active and retains its domed shape with a central crater. Away from the cirques and gorges, the land slopes gradually down to a coastal plain a few kilometres wide. Two major physical differences from the other Mascarene Islands are that, firstly, 61% of the island lies more than 1,000 m above sea-level (the highest point on Mauritius is 824 m) and secondly, around the 201 km of coastline, reefs (20 km long) and islets are almost absent.

The climate is dominated by the south-east trade winds and by tropical depressions. The mountains, especially in the east, are extremely humid, most receiving 2,000–5,000 mm (but locally up to 9,000 mm) of rainfall annually; mean annual temperatures are below 16°C over a wide area, with frosts frequent in winter above 2,000 m. For at least part of most days the slopes from around 1,500–2,500 m are shrouded in cloud. The leeward (western) lowlands are drier and hotter (less than 2,000 mm rainfall, annual mean temperature 23–25°C). The wettest, hottest months are from December to April, while September to November are driest, and June to August are coolest. The heaviest rainfall is brought by cyclones; these are less frequent than in the other Mascarene Islands, but have produced the world’s highest rainfall in a 24-hour period (1,840 mm at Cilaos in 1966).

The Mascarene Islands once supported one of the richest and most extraordinary vertebrate faunas of any oceanic archipelago. Since human colonization, most native vertebrate species have been exterminated and the majority of the native vegetation destroyed by habitat destruction, hunting and the effects of introduced plants and animals. La Réunion retains a much larger area of ecosystems dominated by native species than the other islands (around seven times that on Mauritius), but has suffered a comparable extinction rate.

Diverse types of dry and wet forest and scrub once covered the whole island. Of 546 native flowering plant species, about 30% are or were endemic to La Réunion, and with a further 25% Mascarene Island endemics. The native fauna includes or included at least 52 native, breeding vertebrate species (birds, bats and reptiles). Of these, 27 (52%) are or were endemic to La Réunion, and 19 (4%) to the Mascarenes. However, these species totals are preliminary, as ongoing taxonomic, historical and osteological studies still reveal additional species among the extinct and extant fauna.
Table 1. Summary of Important Bird Areas in La Réunion and Iles Eparses.

<table>
<thead>
<tr>
<th>IBA code</th>
<th>Site name</th>
<th>Administrative region</th>
<th>AT</th>
<th>A2</th>
<th>A4i</th>
<th>A4ii</th>
<th>A4iii</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE001</td>
<td>Piton des Neiges–Gros Morne</td>
<td>Salazie, Saint-Louis</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE002</td>
<td>Grand Bénard–Tapcal</td>
<td>Saint-Louis, Saint-Paul</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE003</td>
<td>Plaine des Chicots–Plaine d’Étioches</td>
<td>Saint-Denis</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE004</td>
<td>Mouth of the Cirque de Salazie</td>
<td>Bras Panon, Salazie</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE005</td>
<td>Rivière des Mansois–Grand Etang</td>
<td>Saint-Benoit</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE006</td>
<td>Grand Bassin–Le Dimitile</td>
<td>Entre-Deux, Le Tampon</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE007</td>
<td>Rivière des Remparts–Rivière Langevin</td>
<td>Saint-Joseph</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE008</td>
<td>Ravine de la Grande Chaloupe</td>
<td>Saint-Denis, La Possession</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE009</td>
<td>Troublier</td>
<td>Iles Eparses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE010</td>
<td>Ile du Lys, Glorieuses Archipelago</td>
<td>Iles Eparses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>RE011</td>
<td>Juan de Nova</td>
<td>Iles Eparses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>RE012</td>
<td>Europa</td>
<td>Iles Eparses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Total number of IBAs qualifying: 12 IBAs covering c.256 km²
Since their permanent establishment in 1646, human colonists have brought about the loss of 75% of the native vegetation area (around natural forest) and 50% of the native vertebrate fauna (including 55% of the birds). At least six plant species and 21 vertebrates have become globally extinct, while 18% of the native flora and 35% of the surviving vertebrates have been reduced to threatened or near-threatened status. In addition, numerous plant and animal species have been introduced, of which c.592 plant, eight mammal, 20 bird, 12 reptile and two amphibian species have become naturalized.

Native species and ecosystems on La Réunion are threatened by exotic species invasion. Degradation by exotic plant species invasion takes the form of a gradual shift in floristic composition towards the exotics. Of at least 32 invasive plant species, the most damaging include *Ligustrum robustum*, *Psidium cattleianum*, *Rubus alcefolius*, *Fuchsia magellanica*, *Hedychium gardnerianum*, *Boehmeria macrophylla*, *Boehmeria penduliflora* and *Lantana camara*. Several exotic animals affect the native flora, for example by destroying native plants, seedlings, fruit or seed, or by spreading exotic plants; birds (especially *Pycnonotus jocosus*), hares *Lepus nigricollis*, *deer Cervus timorensis*, goats *Capra hircus*, rats *Rattus rattus* and *R. norvegicus*, and giant snails *Achatina* spp. are likely culprits. Exotic animals also affect native fauna, as predators (especially *Rattus* and feral cats). Some may also be resource-competitors and vectors for exotic pathogens (such as viruses and blood parasites) that cause diseases. The introduction of further exotic species, especially from nearby Mauritius, is a major threat to native wildlife; the monkey *Macaca fascicularis* (abundant on Mauritius) would probably be the most damaging. Once established on the island, exotic plants and animals are not excluded by protected areas. Therefore, active management is required, even in nature reserves, if conservation is to be achieved.

Four direct human threats to bird populations and habitats now exist. First, illegal hunting has long affected native wildlife, and continues with guns, snares or lime. In 1989–1992, many of the endemic *Pterodroma baraui* were shot as the birds crossed the coast en route to their breeding colonies; once discovered, this practice was controlled by an effective anti-poaching campaign. Second, opening of new paths and tracks into forest areas facilitates invasion by exotic plants and access by poachers. Third, fire is a threat to several areas, especially drier sites. Finally, young petrels and shearwaters (*Procellariiformes*, two of which are threatened, endemic subspecies) taking their first flights at night are often by exotic plants and access by poachers. Third, fire is a threat to several areas, especially drier sites. Finally, young petrels and shearwaters (*Procellariiformes*, two of which are threatened, endemic subspecies) taking their first flights at night are often disoriented by artificial lights and killed before reaching the sea. A programme to rescue disoriented birds (especially *Pterodroma baraui*: 500 birds in 1998) is carried out each year.

**Iles Eparses**

The Iles Eparses are widely scattered islands or archipelagos in the south-west Indian Ocean: four are in the Mozambique Channel (from north to south, the Glorieuses archipelago, Juan de Nova, Bassas da India and Europa) and one (Tromelin) lies east of Madagascar. The Iles Eparses form a French overseas territory, being the last of a chain that continues to Bassas da India; the exception is Juan de Nova, and no economic activity takes place on any of the islands, but Europa holds four endemic subspecies (two birds and two reptiles).

Wildlife has been affected in the past by habitat clearance by humans (except Europa), and direct persecution and disturbance, particularly affecting seabirds. By the 1990s, these direct threats were under control and fire, exotic plant species invasion, browsing and grazing by exotic mammals (especially goats) and predation by exotic mammals (especially *Rattus* species) were the main threats.

**ORNITHOLOGICAL IMPORTANCE**

**La Réunion**

As expected for any remote, oceanic island, La Réunion is poor in species, but has a high proportion of threatened and endemic taxa. The present avifauna of around 78 species comprises nine native landbirds, eight breeding native waterbirds and seabirds, 32 regular migrants (including all seabirds that do not regularly breed), nine accidentals, and 20 naturalized exotics. The waters around La Réunion support a wide range of non-breeding seabird species, but these are not considered in this analysis. Populations of migrants (mainly shorebirds) are not important internationally.

La Réunion supports four endemic landbird species, of which one (the endemic *Coracina newtonii*) nests. *Hypsipetes borbonicus*, *Saxicola tectes* and *Zosterops olivaceus*. Three landbird species are shared only with Mauritius: *Collocalia francica* (*NT*), *Terpsiphone bouroumiensis* (endemic, nominate subspecies) and *Zosterops borbonicus* (endemic, nominate subspecies). All seven are restricted-range species which make up the Réunion Endemic Bird Area (EBA 101). Three further species of global conservation concern are the two endemic petrel species (*Procellariidae*), *Pterodroma aterrima* (CR) and *P. baraui* (CR), together with *Circus maillardi* (*NT*), which is shared with Madagascar and the Comoros, but represented on La Réunion by the endemic, nominate subspecies. Globally significant numbers of *Puffinus herminieri* (endemic subspecies *bailloni*) nest. Fieldwork in the 1990s has produced totally unexpected evidence (but not proof) of the survival of one terrestrial bird, *Pterodroma baraui* (CR) is most likely to be the endemic *Mascareros grychus*, which is known only from sub-fossil remains and therefore presumed long extinct; it would be an extraordinary discovery.

Most native landbird species are widespread in native forest, and some, especially *Zosterops borbonicus*, also use exotic vegetation. However, *Coracina newtonii* is restricted to 16 km² of forest in the far north. *Pterodroma baraui* nests in a few colonies at high altitude in the centre of the island, and the nest-site of *Pterodroma aterrima* is unknown, although one general area is suspected. *Circus maillardi* and *Collocalia francica* are widespread but scarce breeders, the former between sea-level and 1,500 m, the latter in caves.

**Iles Eparses**

Large seabird populations on the Iles Eparses include significant breeding congregations of *Sula sula*, *S. dactylatra*, *Fregata ariel*, *Phaethon lepturus* (with the endemic race *Europa* on Europa), *Phaethon rubricauda* and *Sterna fuscata*, among other species. The seabird community of Europa is isolated and distinct from other

<table>
<thead>
<tr>
<th>IBA code</th>
<th>Réunion Endemic Bird Area (seven species in La Réunion and Iles Eparses; eight sites meet the A2 criterion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Collocola francica</td>
</tr>
<tr>
<td>001</td>
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<td>002</td>
<td>✓</td>
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<td>007</td>
<td>✓</td>
</tr>
<tr>
<td>008</td>
<td>✓</td>
</tr>
</tbody>
</table>

Number of species recorded: 4 6 7 6 6 6 6 6
seabird communities in the region, indicated by the presence of an endemic breeding subspecies, and a unique composition of colour-morphs of S. sula. Europa also holds the only known nesting Ardeola idae (NT) outside Madagascar and Aldabra.

CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

### La Réunion

A Direction Régionale de l’Environnement, representing the Ministry of the Environment, was established in Saint-Denis in 1992. Its mission includes developing measures for nature conservation. Most of the forest is the responsibility of the Office National des Forêts (ONF). Much native forest was altered or destroyed by forestry management between 1960 and 1985, but ONF has recently increased efforts to conserve primary forests, which are no longer subject to sylvicultural management. Forest exploitation is now limited to secondary forest and plantations of exotic Cryptomeria japonica, of which no new plantations are to be created; a gradual decline in Cryptomeria is therefore expected. A Brigade de la Chasse et de la Nature has been created by the Direction Régionale de l’Environnement and the Office National de la Chasse, to help control poaching and educate the public on the island’s wildlife. Le Conservatoire des Espaces Littoraux et des Rivages Lacustres (usually referred to as Le Conservatoire du Littoral), a state organization, acquires and protects littoral or lake areas with ecological or landscape interest. Several non-governmental organizations are concerned with the environment of La Réunion, in particular the Société Réunionnaise pour la Protection de l’Environnement et de la Nature (SREPEN) and the Société d’Études Ornithologiques de la Réunion (SEOR). All native birds are protected; Hypsipetes borbonicus, the last to be protected, gained this status in 1989. Legal hunting is restricted to six exotic species. All release of exotic animals is forbidden.

Three categories of protected area exist at present: Réserve Naturelle, here called Nature Reserves; areas designated under an Arrêté Préfectoral by the Préfet de la Réunion; and the Protected Biotope (Protection Départementale, here called Protected Biotopes; and Réserve Biologique Domaniale, here called State Biological Reserves. Other sites have been acquired by Le Conservatoire du Littoral for conservation purposes. Recognizing that the existing network is inadequate to ensure conservation of the native wildlife of La Réunion, the authorities are planning further protected areas, including establishment of a large new, third category (National Park). Existing and proposed categories are described below.

- **Nature Reserve**—Two sites, totalling c.3,700 ha. Mare Longue, established in 1981, contains 68 ha of the richest lowland rainforest in the Forêt de Saint-Philippe. The Nature Reserve of La Roche Écrite, 3,600 ha, established in December 1999, protects the forests of the Plaine des Chicots and Plaine d’Armes (IBA RE001), including the entire range of the endemic Coracina newtoni.

- **Protected Biotope**—Two sites, totalling 1,820 ha. La Petite Ile, 2 ha, an islet off the south coast, protected since 1986, holds the only nesting Anous stolidus on La Réunion and the largest colony of Puffinus pacificus. Two large mountainous areas totalling 1,818 ha (Piton des Neiges and Grand Bénard, IBAs RE001 and RE002 respectively), encompass all known colonies of Pterodroma barau and were classified as a Protected Biotope in February 2001.

- **State Biological Reserve**—Six sites, totalling 13,101 ha. These sites are not so strictly or permanently protected as the above two categories, because limited forestry management is practised, and the reserves can be reappraised with each official adjustment of forest land.

- **Other reserves**—Nine sites recently have been acquired by Le Conservatoire du Littoral. Most are very small and of limited value for birds; the most important are La Grande Chaloupe (257 ha in 1995, with a further 97 ha acquired by the Département de la Réunion in 1996; a management plan is in preparation, and expansion proposed); Forêt de Bois Blanc (361 ha of native forest, with all native forest birds except Coracina newtoni), and Etang du Goil (30 ha, lake and wetland). A private reserve exists at Etang de Bois Rouge (29 ha of lake and wetland; protected since 1992). Of these four, only La Grande Chaloupe is here considered an Important Bird Area (IBA RE008). Sites totalling 366 ha have been acquired by the Département de la Réunion to slow urbanization and maintain natural landscapes.

- **Reserves to be established**—Studies towards the establishment of a National Park (Parc des Hauts) covering a large portion of the central mountains and native forest, are under way. Two new wetland Nature Reserves—Etang de Saint Paul and Les Lagons, neither of which is an Important Bird Area—are both in the planning stages.

### Iles Eparses

All islands are administered by the Préfet de la Réunion, which controls access by researchers and tourists. Glorieuses, Bassas da India, Europa and Tromelin became Nature Reserves in 1975. However, these designations have not been approved nationally, as they were decided by Arrêté Préfectoral by the Préfet de la Réunion and not by Decret Ministériel following the 1976 Law on Nature Protection. Classification as Strict Nature Reserves (Réserves Naturelles Intégrales) by Arrêté Ministériel is needed to strengthen the sites’ protection. Juan de Nova is unprotected.

INTERNATIONAL MEASURES RELEVANT TO THE CONSERVATION OF SITES

France has signed and ratified the Convention on Biological Diversity, CITES, the Ramsar Convention, the World Heritage Convention, the Convention on Migratory Species, the Convention on Climate Change, and the Convention to Combat Desertification, and it participates in the UNESCO Man and Biosphere programme. Other agreements include the International Tropical Timber Agreement 1983, United Nations Convention on the Law of the Sea (UNCLOS), and Convention on Fishing and Conservation of Living Resources of the High Seas.

OVERVIEW OF THE INVENTORY

The inventory comprises 12 Important Bird Areas (IBAs): eight on La Réunion, and four on Iles Eparses (Map 1, Table 1).

#### La Réunion

The eight sites on La Réunion cover 216 km² (9% of the island surface). Two occupy the highest summits in the zone dominated by bare rock and montane shrubland or bushland and thicket. Five are at medium altitudes, occupied by mixed moist evergreen forests (montane and lowland); some of these sites extend up to the high montane region. The eighth site is in the lowlands, and supports dry evergreen lowland forest, the island’s most threatened habitat-type. The site is a National Reserve (IBA RE001), was acquired by the Office National des Hauts, will afford strong protection to most sites. Furthermore, natural protection is provided to several sites by the precipitous terrain. The restricted distribution of Coracina newtoni and the main concentrations of Circus maillardi, Pterodroma baraui, Puffinus herminieri and probably Collocalia francica are known, allowing the inventory to cover these species fairly effectively. For C. maillardi, five or more pairs is here considered an important subpopulation. However, undiscovered colonies of the latter three species probably exist outside the site network presented here, and could add to the number of sites. The nesting sites of Pterodroma aterrima are unknown, but recent discoveries of disoriented juveniles attracted to lights have allowed tentative identification of one likely nesting area. The five non-threatened, restricted-range species are widespread on the island; seven of the eight IBAs contain populations of all five (Table 2). Some of the largest expanses of moist forest, such as La Forêt de Saint-Philippe (south-east) and Bébour–Pleine des Lianas (centre-east), are excluded from the inventory. They hold large populations of these five species, but less significant numbers of the rarer species. Although not considered here as Important Bird Areas at the global
level, they are nonetheless vital areas for conservation of native biodiversity.

■ Illes Eparses

The four sites in the Illes Eparses cover around 40 km² (89% of the territory’s land surface), with only Grande Glorieuse (around 500 ha) and Bassas da India (no permanent land) excluded. The distribution of seabird colonies is well known, although Juan de Nova has been visited by a naturalist only once in the last 40 years, which visit confirmed the survival of the large colony of Sterna fuscata, upon which that site’s selection is based. Three of the four sites are protected, the exception being Juan de Nova.

COMMENTS ON THE INVENTORY

• On La Réunion, a detailed classification for native plant communities was developed by Rivals (1952) and Cadet (1980). For the habitats mentioned in this inventory, the IBA habitats classification required by the present study (see Appendix 7) can be related to Cadet (1980, as translated by Thiolay and Probst 1999), as follows.

  Cadet BirdLife
  Dry woodland BirdLife
  Lowland forest—dry evergreen
  Lowland forest—mixed moist evergreen
  Montane forest—mixed
  Shrubland or Bushland and thicket—montane
  Exotic vegetation

• In Africa and Madagascar, montane forest is typically found only above 800 m, whereas in La Réunion it is found as low as 400 m.

• Place names and spelling follow those of the Institute Géographique National (1987). Most sites occupy more than one canton (IBA RE001 occupies four); the cantons that account for more than about 30% of a site are listed.

ACKNOWLEDGEMENTS

This chapter has benefited greatly from up-to-date, unpublished information provided by the following fieldworkers: T. Gerdil, G. Jacubek, J. Bried, T. Ghenttemme, E. Portier and other members of the Société d’Etudes Ornithologiques de la Réunion. Bird censuses on La Réunion and the Illes Eparses were supported financially by the Direction Régionale de l’Environnement (Ministère de l’Environnement), the Conseil Régional de la Réunion, the European Union and the Office National de la Chasse. Fieldwork on seabirds of La Réunion and the Illes Eparses was part of a study conducted by the Centre d’Études Biologiques de Chizé (Centre National de la Recherche Scientifique) and fieldwork on the landbirds of La Réunion was part of a study conducted by the Laboratoire d’Ecologie of the Ecole Normale Supérieure de Paris. We (especially the senior author) also thank Ms Sonia Ribes, curator of the Muséum d’Histoire Naturelle de La Réunion for encouragement and logistical support, and Météo-France and the Forces Armées de la Zone Sud de l’Océan Indien for allowing access to the Illes Eparses. Human population data are taken from the United Nations Statistics Division web-site. Information on international conventions is taken from the web-sites of the respective conventions.

SITE ACCOUNTS

■ Piton des Neiges–Gros Morne

Admin region Salazie, Saint-Louis
Coordinates 21°50’S 55°29’E
Area 2,000 ha Altitude 2,000–3,069 m

■ Site description

The site is made up of the mountainous massif that includes Le Piton des Neiges (3,069 m, the island’s highest summit) and Le Gros Morne (2,991 m, the meeting point of the island’s three cirques). Its formation resulted from the activity of the now extinct volcano, followed by its collapse and severe erosion. The lower parts (2,000–2,800 m) are covered by montane shrubland or bushland and thicket, whereas the summits are largely bare rock and volcanic scree. The area is uncultivated and uninhabited apart from a mountain refuge, and is used for recreation and tourism, especially hiking, climbing and helicopter trips.

■ Birds

See Box and Table 2 for key species. The site covers the most important breeding area (at least four colonies) of the endemic Pterodroma baraui and could possibly support a small population of P. aterrima.

■ Conservation issues

Much of the site (around Le Piton des Neiges) has been classified under an Arrêté de Protection de Biotope since January 2001. This will regulate intrusive activities such as climbing and helicopter flights which are increasing in popularity and which may affect colonies of Pterodroma baraui. Operations to control introduced vertebrates are also proposed. Rats Rattus rattus and feral cats are proven threats to the survival of the colonies, and feral goats cause degradation of soil and vegetation near the colonies and may reach the colonies themselves.

■ Further reading


■ Grand Bénard–Tapical

Admin region Saint-Louis, Saint-Paul
Coordinates 21°07’S 55°25’E
Area 1,500 ha Altitude 950–2,896 m

■ Site description

The site comprises the peaks, cliffs and ridges radiating from Le Grand Bénard (2,896 m), including parts of the rims of the Cirque de Cilaos and the Cirque de Mafate, together with the western part of the Cirque de Cilaos (Le Tapical). The spectacular terrain results from erosion of the volcanic Piton des Neiges massif. The summits and ridge-tops are almost devoid of vegetation, but the slopes and ledges support montane shrubland or bushland and thicket characteristic of high altitudes. Le Tapical is covered with a fine stand of mixed montane forest, although exotics dominate in a few small areas.

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**Birds**

See Box and Table 2 for key species. The site supports important colonies of two seabird species, including *Pterodroma barbata* (2–3 colonies), for which only one other breeding area (RE001) is known. All of the forest-living endemic birds of La Réunion occur except *Coracina newtoni*. In 1997, 1–3 pairs of *Circus maillardi* were present.

**Conservation issues**

Alongside the ubiquitous threats associated with fire and exotic plant and animal invasion, threats of particular concern at this site are ‘traditional’ liming of forest passerines, and destruction of undergrowth (including native seedlings) by *Cerus timorensis*. The whole site was classified as a Nature Reserve in December 1999, and a management plan is being developed under the auspices of the ONF and Direction Régionale de l’Environnement de la Réunion. This will largely remove the threat from poaching, allow reduction in *Cerus timorensis* numbers, and provide for continuing monitoring (six progress since 1993) of the *Coracina newtoni* population. *Cryptopterus* has not been planted since the early 1980s and no further planting is planned.

**Further reading**


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**Other threatened/endemic wildlife**

Endemic plant communities: forest, shrubland and bushland and thicket rich in endemic plants.

**Site description**

Part of the site, along with Le Piton des Neiges (IBA RE001), has been classified under an Arrêté de Protection de Biotope since January 2001, which will regulate intrusive activities. The inaccessibility of the site offers natural protection from people, but the increase in mountaineering and helicopter excursions threatens colonies of *Pterodroma barbata*.

**Further reading**


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**Birds**

See Box and Table 2 for key species. The site is the only breeding area for *Coracina newtoni* (entire known population, 120–150 pairs) and supports populations of all the other, forest-living birds of La Réunion, together with important colonies of *Puffinus herminsi*. Up to five pairs of *Circus maillardi* were present in 1998.

**Conservation issues**

This is a mid-altitude site that includes the steep-sided ravine of the gorges foraging territory for *Puffinus herminsi* (about 10 colonies), *Circus maillardi* (8–12 pairs in 1998) and *Collocalia francica* (probably several colonies), but also supports a typical community of native, forest-living birds.

**Further reading**


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**Other threatened/endemic wildlife**

Endemic plant communities: rich forest with many endemic plants. Lepidoptera: several endemic moth species. Reptiles: *Phelsuma borbonica* (endemic).
volcano. The ravine cuts into the Bébour plateau, a forested area due west of Le Piton des Neiges, at the Caverne des Hirondelles (at 1,334 m). The site extends from this point down the river to the lowlands at 83 m, and also over the ridge to the south to include Le Grand Etang and its surroundings. Most of the site is remarkably unaltered ecologically, with extensive, rich native plant communities, especially mixed moist evergreen lowland forest; a few stands of exotic vegetation are present. The lake covers about 30 ha. No land-uses are known, although the lake and part of the ravine are accessible by road or track.

Birds
See Box and Table 2 for key species. The site is particularly important for Puffinus hermíneri (common breeding visitor), Circus maillardi (8–12 pairs in 1998) and Collocalia francia (several colonies known), but also supports a typical community of native, forest-living birds, most at notably high densities.

Conservation issues
No conservation projects are known. The cliffs are naturally well protected, but clearance of the forest, especially the privately-owned Forêt du Dimitile, is not controlled, and fire may be a particular threat at this site. Further searches for Pterodroma aterrima are very much needed.

Further reading

Site description
The site comprises two extremely steep-sided ravines in the south of the island, separated by a narrow, cultivated plateau and an uncultivated ridge. The riverbeds are affected by floods and landslides, and support a few habitations and cultivated areas, but the ramparts are unaltered. The site includes lowland and montane habitats (100–2,320 m), including mixed moist evergreen lowland forest, mixed montane forest, and montane shrubland, bushland and thicket. The most exposed, steep cliffs are bare rock.

Birds
See Box and Table 2 for key species. Rivière des Remparts supports the highest density of Puffinus hermíneri colonies known on La Réunion, and also a high density of Circus maillardi (10–15 pairs in 1997). All the other forest-living native birds of La Réunion occur, except Coracina newtoni. Historical accounts describe petrels Pterodroma sp. nesting in the upper part of the site; none have been found recently, but they may nevertheless occur.

Other threatened/endemic wildlife
Endemic plant communities: forest, shrubland and bushland and thicket rich in endemic plants.

Conservation issues
No conservation projects are known. The cliffs are naturally well protected, but clearance of the forest, especially the privately-owned Forêt du Dimitile, is not controlled, and fire may be a particular threat at this site. Further searches for Pterodroma aterrima are very much needed.

Further reading

Rivière des Remparts–Rivière Langevin
Admin region Saint-Joseph
Coordinates 21°15’S 55°39’E A1, A2 (101), A4ii
Area 7,000 ha Altitude 100–2,320 m Unprotected

Site description
The site comprises two extremely steep-sided ravines in the south of the island, separated by a narrow, cultivated plateau and an uncultivated ridge. The riverbeds are affected by floods and landslides, and support a few habitation and cultivated areas, but the ramparts are unaltered. The site includes lowland and montane habitats (100–2,320 m), including mixed moist evergreen lowland forest, mixed montane forest, and montane shrubland, bushland and thicket. The most exposed, steep cliffs are bare rock.

Birds
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Other threatened/endemic wildlife
Endemic plant communities: forest, shrubland and bushland and thicket rich in endemic plants.
**Site description**

The site comprises the smaller of the two islands of the Glorieuses Archipelago, which lie in the north of the Mozambique Channel, almost equidistant from Mayotte, Aldabra and Madagascar, but 180 km west of the northernmost tip of the latter. The larger island, Grande Glorieuse, is highly degraded and of little ornithological interest. Ile du Lys is a low (up to 15 m) coral islet 10 km north-east of Grande Glorieuse. The two are connected by sandbanks that are exposed at low tide. The vegetation is patchy evergreen bushland and thicket covering around 30% of the islet.

**Conservation issues**

The site was made a Nature Reserve in 1975. Classification as a Strict Nature Reserve by Arrêté Ministériel is needed to improve the site’s protection (see ‘Conservation infrastructure and protected-area system’). Tromelin is an important research site. Human disturbance to the seabird colony is minimal. *Rattus norvegicus* have been abundant and are a limiting factor to seabird populations, but are controlled periodically (although never eradicated) by poisoning.

**Further reading**


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**Ile du Lys, Glorieuses Archipelago**

**RE010**

**Admin region** Iles Eparses

**Coordinates** 11°29'S 47°23'E

**Area** 60 ha

**Altitude** 0–15 m

**Nature Reserve**

**Key species**

| A1i | Sterna fascata |
| A4ii | More than 100,000 pairs of seabird nest at this site.

**Site description**

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**Further reading**

**Other threatened/endemic wildlife**
The islet is a nesting site for the sea-turtle Chelonia mydas (EN).

**Conservation issues**
Unlike the other Iles Eparses, this site was not made a Nature Reserve in the 1970s, because of political factors operating at the time, and it remains unprotected. Threats have not been studied in detail. However, by analogy with other islands in the region, disturbance to the seabird colony, and the impacts of exotic mammals, are likely to be problems. Predation of seabirds by cats has recently been confirmed, and Rattus sp. and Mus musculus are both present.

**Further reading**

**Site description**
Europa is an island in the southern Mozambique Channel, 350 km west-south-west of Morombe, Madagascar. It is one of the last modified coraline islands in the western Indian Ocean and was formed from the progressive filling of an ancient atoll which appeared 90,000 years ago. It is composed of a central lagoon largely surrounded by mangrove Rhizophora mucronata; shrubland, bushland and thicket, dominated by Psidiu altissima, Suriana maritima and/or Pemphix acidaula; Euphorbia stenocula dry forest; Sclerodactylon macrostachyum grassland; halophile vegetation (Arthrocnemum indicum) and afringing beach- and dune-system rising to 12 m, the highest land on the island. In all, 33–46 angiosperm species occur. Eighteen people live on the island in shifts of 45 days; three occupy a terrace below the highest land on the island. Seabirds suffer from predation by introduced Rattus rattus and by two landbirds Tyto alba and Corvus albus, which are probably native, but which have populations maintained at high levels by human and exotic rodent populations. Further threats to native ecosystems are browsing by introduced goats Capra hircus (which number over 300), invasion by exotic plants (Agave sizalana and Furcraea foetida are already present, others may arrive) and animals (further introductions are a danger), fires and occasional human disturbance. To date, conservation activities include experimental eradication of Rattus rattus from a small islet to test the effect on seabird nesting success, control of Corvus albus, waste control, and monitoring of vegetation and seabird distributions.

**Birds**
See Box for key species. Europa holds a diverse and very large population of breeding seabirds, with five species occurring in globally significant numbers, and it is also the only known breeding site outside Madagascar and Aldabra for the globally near-threatened Ardeola idae (up to 15 pairs in 1996). Additional nesting waterbird and seabird species are Fregata minor (700–1,100 pairs; the second largest colony in the western Indian Ocean), Puffinus tenuirostris (50–100 pairs; probably of the subspecies P. t. bailloni, previously thought to be endemic to the Mascarene Islands), Egretta dimorpha (abundant breeding resident) and Sterna caspia (10–15 pairs). The seabird community appears to be biogeographically isolated from others in the region as it shows several unique features, including the presence of an endemic subspecies, Phaethon lepturus europae. Three landbird species are present, of which one, the abundant Zosterops madagascarensis aetnapo, is an endemic subspecies. A wide range of migrant and vagrant species have been recorded.

**European**

<table>
<thead>
<tr>
<th>Key species</th>
<th>A1</th>
<th>Breeding (pairs)</th>
<th>Non-breeding</th>
</tr>
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<tbody>
<tr>
<td>Stema fascata</td>
<td>100,000</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Fregata ariel</td>
<td>500,000+</td>
<td>—</td>
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<tr>
<td>Phaethon lepturus</td>
<td>1,000–1,200</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sterna caspia</td>
<td>3,000–4,000</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Sulcata sulcata</td>
<td>500–1,000</td>
<td>—</td>
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</tr>
<tr>
<td>A4ii More than 500,000 pairs of seabird nest at this site.</td>
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</tbody>
</table>

**Further reading**

**European**

<table>
<thead>
<tr>
<th>Key species</th>
<th>A1</th>
<th>Breeding (pairs)</th>
<th>Non-breeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardeola idae</td>
<td>2,800–3,800</td>
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<td>—</td>
</tr>
<tr>
<td>Phaethon rubricauda</td>
<td>3,000–4,000</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sterna caspia</td>
<td>2,800–3,800</td>
<td>—</td>
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<td>A4ii More than 500,000 pairs of seabird nest at this site.</td>
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</tbody>
</table>

**Further threatened/endemic wildlife**
The island is a nesting site for the sea-turtle Chelonia mydas (EN), and Eretmochelys imbricata (CR) and Caretta caretta (EN) are both present. There are two endemic lizard subspecies (Mahuya comorensis infralineata and Cryptoblepharus bottouii bitaeniatus), Overall, the coral island ecosystem is one of the finest in the Indian Ocean.

**Conservation issues**
Europa has received little attention from the scientific or conservation communities, yet it seems hardly more damaged than the much more famous Aldabra atoll (Seychelles). It was made a Nature Reserve in 1975. Classification as a Strict Nature Reserve by Arrêté Ministériel is needed to improve the site’s protection (see ‘Conservation infrastructure and protected-area system’). Seabirds suffer from predation by introduced Rattus rattus and by two landbirds Tyto alba and Corvus albus, which are probably native, but which have populations maintained at high levels by human and exotic rodent populations. Further threats to native ecosystems are browsing by introduced goats Capra hircus (which number over 300), invasion by exotic plants (Agave sizalana and Furcraea foetida are already present, others may arrive) and animals (further introductions are a danger), fires and occasional human disturbance. To date, conservation activities include experimental eradication of Rattus rattus from a small islet to test the effect on seabird nesting success, control of Corvus albus, waste control, and monitoring of vegetation and seabird distributions.

**Further reading**

**BIBLIOGRAPHY**


Important Bird Areas in Africa and associated islands – La Réunion and Iles Eparses


