MAYOTTE

ROGER J. SAFFORD

GENERAL INTRODUCTION

Mayotte (also known by its Comorian name, Maore) is the easternmost of the four islands of the Comoro archipelago, in the tropical south-west Indian Ocean (12°48′S 45°09′E). Nearest neighbours are Ndzouani (Anjouan) in the Federal Islamic Republic of the Comoros (80 km north-west), Madagascar (300 km south-east) and Mozambique (470 km west). Mayotte covers 374 km², has 185 km of coastline, and is composed of a main island (Grande Terre), three satellite islands covering over 100 ha (notably Petite Terre, which has three towns) and around 20 smaller islets. The population was 47,246 in 1978, rising to 130,000 in 1999, and is still increasing. The population density and growth-rate are among the highest in Africa.

Mayotte came under French protection in 1841, the other three main islands of the Comoro archipelago in 1886. In 1975, the three western islands became the Federal Islamic Republic of the Comoros (hereafter referred to as the Republic). Mayotte remained French, but was re-titled a Collectivité Territoriale à caractère départemental, and French support has ensured much faster economic development than the Republic. The head of state is the French president. Local legislation is controlled by a Conseil Général (General Council), and Mayotte has one seat in each of the French National Assembly and Senate. The largest town is the capital, Mamoudzou. The island is divided into 17 communes or cantons.

Mayotte has a tropical, humid, hot, maritime climate. A hot wet season (average 27°C) extends from November or December to April, with a cooler dry season (average 24°C) between May and October. Annual rainfall is in the range 1,000–2,000 mm, with the highest totals (perhaps locally over 2,000 mm) on the mountains; around 80% falls in the wet season. Cyclones occasionally reach the island, causing severe destruction.

Geologically, Mayotte is the oldest of the Comoros. It is the eroded remains of the eastern flank of a large volcano, modified by subsequent phases of volcanic activity, the most recent of which have left clearly identifiable small craters. Soils are variably fertile, but suffer from poor water-retention capacity. Little flat land exists; the island is mostly hilly, but nowhere precipitous, with sharp ridges and triangular peaks. The highlands may be divided into four massifs, the highest of which, Mlima Bénara, reaches 660 m. Erosion has been locally severe, in the worst cases leaving completely bare patches known locally as padza. Mayotte is entirely surrounded by a coral barrier reef, which has been considered as the finest in the Indian Ocean, but which is suffering severely from run-off of sediment from the land. Seagrass beds are also found in the lagoon. A few sandy beaches are present, and also a 200 ha tidal lagoon on Petite Terre.

The island was once forested, with dry, humid and transitional types recognized. Most of this was destroyed before 1900, leaving fragments of native forest which covered 1,150 ha (3% of the island area) in 1999; most (673 ha) is humid forest. A further 14,800 ha of the island’s vegetation has been classified as secondary forest. This surrounds the native forest relics and exists on all peaks above c.300 m. Around 2,600 ha of secondary forest described as ‘dense’ was present in the early 1990s. The secondary forest is evergreen, or semi-evergreen in the driest areas, and composed of mixed native species, mango Mangifera indica, Litsea glutinosa and other exotics; it is classified here as mixed montane forest. A drier, lower-canopied forest occurs in the southern peninsula, and dry (probably semi-evergreen) bushland and thicket (with baobabs Adansonia digitata) in the extreme south-east. Elsewhere, the land is covered in a mixture of ylang-ylang Cananga odorata and coconut plantations, subsistence agriculture, padza, exotic thickets, grassland and scattered trees. Sheltered coasts support mangroves (750 ha) similar to those of Madagascar and East Africa.

Around 59 native vertebrate species (birds, mammals, reptiles and amphibians) breed, although this total may need modification in the light of ongoing research on the taxonomy, identification and true status (native or introduced) of several species. Eight species (14%) are endemic to Mayotte: three birds (see below), the three Phelsuma geckoes P. robertmertensi, P. nigristriata and
The major environmental problem is deforestation, which takes place to allow livestock-rearing and subsistence (shifting) and plantation agriculture. This has led to habitat destruction, erosion and siltation of the lagoon, such that some inshore reefs have been destroyed. Mangroves are also threatened by such sedimentation, and forest is therefore considered the most important habitat for native wildlife.

Forest invasion by exotic plants and animals threatens what remains of native ecosystems. Exotic plants are common, and six exotic birds and six mammals have become established, the latter possibility, although its occurrence is not well documented. The lagoon is being further damaged by over-exploitation.

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Three species are endemic to Mayotte (although differing opinions on taxonomy affect this; see ‘Comments on the inventory’). Two (Nectarinia coquerelii and Dicrurus waldeni) are highly distinctive, the third (Zosterops mayottensis) much less so. Three more (Columba pollenii, Alectroenas sganzini and Dicrurus waldeni) are otherwise found only in the Republic and/or Aldabra, and are therefore also restricted-range species. D. waldeni is primarily a species of humid forest on mountains, but occurs locally at sea-level in mangroves, littoral tree-belts and certain types of woodland. N. coquerelii and Z. mayottensis are widespread inside and outside forest. Columba pollenii and Alectroenas sganzini are largely restricted to forest. Of these six species, only Foudiaenantissimata (Mayotte-endemic race algonia) avoids forest, instead inhabiting coastal, non-forest areas. It is thus very distinct ecologically, as well as morphologically, from the other races of the species. Non-endemic species are represented by three Mayotte-endemic and five Comoro-endemic subspecies.

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Dicrurus waldeni is globally threatened (CR). Other species of conservation concern are Columba pollenii (NT), and three mainly Malagasy species—Ardea humbloti (VU), Ardeola idae (NT) and Circus pinitorquatus (VU)—whose tiny numbers on Mayotte are of little global significance; indeed, the latter appears to have disappeared recently from Mayotte. Mayotte, with The Republic, forms the Comoro Islands Endemic Bird Area (EBA 098). Of the 19 restricted-range species that define this EBA, six occur in Mayotte and three are confined to it (see Table 2).

Mayotte has the most species-poor avifauna of the four islands of the Comoro archipelago. The avifauna comprises around 79 species: 24 native breeding landbirds, eight breeding waterbirds and seabirds, 30 regular non-breeding migrants (including all seabirds), 17 vagrants and seven exotics. The reasons for this poverty are unknown, but the island’s zoogeographical position, low elevation and forest-type unlike the other islands could have hindered species colonization or establishment. Successful colonists could also have been lost in unrecorded extinctions, caused by habitat destruction and introduction of exotics since human colonization. Mayotte’s waters may be important for non-breeding seabirds, because of the productivity of the large barrier reef. Populations of other migrants (mainly shorebirds) are not important internationally.

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### ORNITHOLOGICAL IMPORTANCE

The major environmental problem is deforestation, which takes place to allow livestock-rearing and subsistence (shifting) and plantation agriculture. This has led to habitat destruction, erosion and siltation of the lagoon, such that some inshore reefs have been destroyed. Mangroves are also threatened by such sedimentation, and forest is therefore considered the most important habitat for native wildlife.

### CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

Environmental protection is the responsibility of the Direction de l’Agriculture et de la Forêt (DAF), which was created in 1978, but legislation has been difficult to enforce because most was developed elsewhere and is inappropriate to local conditions. However, ordinances have recently been introduced specifically for the territory, covering forestry (including agroforestry, an innovation in French law) and protection of nature. The latter (by decree passed in 1997) entrusts to the French government representative in Mayotte the responsibility of making operational the legal instruments necessary for preservation of animal and plant species and natural areas. Further steps in this process are awaited; for example, legislation needed for species protection, release of exotics and control of hunting. 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. Local and non-governmental organizations are also increasingly involved with the environment of Mayotte.

The forest areas are controlled by the Service des Eaux et Forêts of DAF. A network of 17 Réserves Forêtières (Forest Reserves) has been established, covering 5,676 ha. The larger reserves are based on summits and ridges. The network excludes some forest, and large parts are not forested, but it forms a good basis for protection of watersheds, watercourses and wildlife habitat. In addition, the Sahel peninsula is protected by the Conservatoire du Littoral, because of the area’s importance for plants and turtles. A Fishing Reserve exists in the lagoon, but this probably has little direct relevance to bird conservation.

INTERNATIONAL MEASURES RELEVANT TO THE CONSERVATION OF SITES

France has ratified the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species (CITES), the World Heritage Convention, the Convention on Migratory Species, the Convention to Combat Desertification and the Convention on Climate Change. It is a contracting party to the Ramsar Convention on Wetlands of International Importance, although Mayotte has no Ramsar Sites. 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

This inventory identifies five Important Bird Areas (IBAs), covering an area of 69.6 km² (Table 1, Map 1). This is 19% of the land area of Mayotte, of which c.31 km² (45%) are in Réserves Forêtières. IBAs YT001–YT003 hold mixed montane forest in the north and centre of the island. Site YT004 is an area of mangrove and mixed littoral woodland, and site YT005 contains drier forest and semi-evergreen bushland and thicket. Only site YT004 is completely unprotected. Data on the distribution of landbirds are reliable, recent and comprehensive. All six of the restricted-range species of the Comoro Islands EBA that occur in Mayotte are well represented in the set of sites (Table 2). Most of them, indeed, occur throughout the island, while the threatened Ardea humboldti is apparently an irregular visitor; these species are therefore poor indicators for sites. However, populations of Dicrurus waldeni and Foudia eminentissima are more patchy and their distributions are well known. Forest and coastal areas (mangrove or littoral) appear to have distinct bird communities. Sites are therefore selected to ensure inclusion of a viable population of D. waldeni and F. eminentissima (but not their entire populations), and representative areas of forest and coastal habitat-types used by the other Comoros-endemic bird taxa.

SITE ACCOUNTS

Hachiroungou

Admin region Acoua
Coordinates 12º43’S 45º04’E
Area 160 ha Altitude 180-496 m

<table>
<thead>
<tr>
<th>YT001</th>
<th>A1, A2 (098)</th>
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<td>Forest Reserve</td>
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Site description

The site comprises the massif in the north-west of Mayotte, dominated by the peak of Hachiroungou (496 m). Ridges extend north, east and south, forming the watershed of the Dzoumouény catchment. This area includes the upper slopes (over 180 m above sea-level) of Hachiroungou, the southern and eastern ridge, and the valley between these. The northern ridge (towards Milma Dziani Boli, 472 m) is excluded as it is deforested. The nearest towns are Dzoumonyé and Acoua and Mtamboro to the west. The slopes of Hachiroungou rise steeply to a triangular summit, and the slopes of the still partly forested Mapouéra valley are also fairly steep and dissected with streams. Hachiroungou supports a small expanse of mixed montane forest surrounded by cultivation and padza.

Birds

See Box and Table 2 for key species. The entire community of forest-living birds of Mayotte (around 14 species) is found at this site. Populations are likely to be small, in line with the area of forest remaining. Most species are common and not restricted to forest, although Dicrurus waldeni is found only in forest and forest-edge and the two pigeons are forest-dependent. Additional species occur in the cultivated land and villages around the forested area.

Key species

<table>
<thead>
<tr>
<th>A1</th>
<th>A2 (098)</th>
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<td>C. polleni</td>
<td>D. waldeni</td>
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| Comoro Islands EBA | Five of the six species of this EBA known from Mayotte have been recorded at this site; see Table 2.

GLOSSARY

milma mountain
padza totally degraded land, devoid of vegetation.

ACKNOWLEDGEMENTS

General information is based mainly on Battistini and Vérin (1984), Koechlin and Boye (1984) and Louette (1999). Information on international conventions is taken from the web-sites of the respective conventions. M. Louette (Musée Royal de l’Afrique Centrale, Tervuren, Belgium) provided valuable comments on the chapter. Useful comments and unpublished observations on environmental issues came from I. Tattersall and R. Stobbs.

COMMENTS ON THE INVENTORY

- Place names and spelling follow those used in Institut Géographique National (1993), these are generally phonetically rendered French versions of the local (Chimaore) names.
- Distribution of forest is based on Institut Géographique National (1993), mapped from satellite imagery in 1989, and Louette (1999). These maps also show boundaries of Réserves Forestières, but not all 17 mentioned by Direction de l’Agriculture et de la Forêt (1992, cited by Louette et al. 1993) are named.
- The forest in the sites chosen is tentatively classified as mixed montane forest, like the forests of the Republic, to which it shows most resemblance. However, the forest on Milma Choungui (IBA YT005) is drier and may prove to be dry evergreen lowland forest.
- Site selection depended heavily on the work of the joint programme of the Musée Royal de l’Afrique Centrale (Tervuren, Belgium) and the Service des Eaux et Forêts de Mayotte (Louette et al. 1993, Stevens and Louette 1999). Information on taxonomy, endemism and distribution for reptiles is taken from Meiré (in Louette 1999); for butterflies, Turlin (1995).
- IBAs YT001, YT002, YT003 and YT005 lie partly in cantons other than those listed.
- The Zosterops taxon on Mayotte (mayottensis) is treated by BirdLife International as a species endemic to Mayotte, but some authorities (including the author) consider it a subspecies of Zosterops maderaspatanus (see Louette 1988a,b). The endemic Otus taxon (mayottensis) is treated by BirdLife International as a race of Otus rutilus of Madagascar, but Rasmussen et al. (2000) reviewed the genus in the region and proposed treatment of mayottensis as an endemic species. Taxonomic treatment of these species does not affect site selection.
- The islets are excluded from the inventory. Wildlife surveys may reveal animal and plant species absent from the mainland, as is the case in the Mascarenes and Seychelles. The islets could have greater potential for ecological rehabilitation than equivalent areas of mainland, but no such plans are currently known.
Other threatened/endemic wildlife

Reptiles: *Phelsuma geckos* *P. robertmertensi*, *P. nigristrata* and *P. pasteurii*. No other data specific to this site.

**Conservation issues**

Around 400 ha of the massif is protected in the Réserve Forestière de Dzoumony. However, the east-facing slopes and most of the partly-cleared Mapouéa valley are excluded from the reserve. Known threats are typical of forests on Mayotte, especially deforestation and hunting of pigeons.

**Further reading**

Louette (1988a,c, 1999), Louette et al. (1993), Stevens and Louette (1999).

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**Site description**

The site is made up of the mountain massif in the north-centre of Mayotte, dominated by two peaks—Mtsapéré (also called Majimbini, 572 m) and Combaní (477 m)—connected by a ridge that does not drop below 320 m. The terrain is mainly undulating, although steep slopes occur around Mtsapéré. The site includes most of the land above 200 m, although cultivation that extends higher than this (especially around the towns of Vahibéni and Combaní) is excluded. The nearest towns are Mamoudzou to the east and Combaní to the west; this site contains the catchment for both. The area contains the largest expanse of forest on Mayotte. Vehicle tracks lead almost to the tops of both mountains, and an antenna is sited near the top of Mtsapéré.

**Birds**

See Box and Table 2 for key species. The site contains the full community of forest-living birds (around 14 species) of Mayotte. Most are common and are not restricted to forest, but the two pigeons are forest-dependent. By virtue of its large extent, this site may be the most important for *Dicrurus waldeni*. Additional species occur in the cultivated land and villages around the forested area.

**Further reading**

Benson (1960), Louette (1988a,c, 1999), Louette et al. (1993), Stevens and Louette (1999).

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**Other threatened/endemic wildlife**

Reptiles: *Phelsuma geckos* *P. robertmertensi*, *P. nigristrata* and *P. pasteurii*. No other data specific to this site.

**Conservation issues**

About half of the area (1,615 ha) is protected in the Réserve Forestières de Combaní (290 ha) and Majimbini (1,325 ha). Most of the Koualé catchment, which forms the eastern part of Milma Combaní, is unprotected. Known threats are typical of forests on Mayotte, especially deforestation and hunting of pigeons.

**Further reading**


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**Site description**

The site is dominated by the peak Milma Bénara (660 m), the highest on Mayotte, and part of the mountain massif that dominates the south-centre of the island. Ridges extend 4 km west to Tchaourembo (581 m) and Ngouni Mabougani (510 m), and 4 km east to Trambatsini (297 m). The site includes this long ridge, its slopes and small, wooded catchments to the north, down to an altitude of about 200 m, which is the typical upper limit of cultivation. Villages are present on coasts on all sides; Démbéni, Bandréli, Pororani, Sada and Ouangani are the largest, with catchments largely in this area. The ridge is sharp, and the upper slopes of Milma Bénara rise steeply to a triangular peak. The area contains probably the second-largest expanse of forest on Mayotte, although it is somewhat fragmented near its lower limit and is crossed by several trails, and is also used for hunting.

**Birds**

See Box and Table 2 for key species. The site contains the full community of forest-living birds (around 14 species) of Mayotte. Most are common and are not restricted to forest, but need woody vegetation of some sort; only the two pigeons are restricted to forest. Additional species occur in the cultivated land and villages around the forested area.

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**Other threatened/endemic wildlife**

Reptiles: *Phelsuma geckos* *P. robertmertensi*, *P. nigristrata* and *P. pasteurii*. No other data specific to this site.

**Conservation issues**

Part of the forest (1,375 ha) is protected in the Réserve Forestières de Tchaourembo, Voundzi, and Hajangoua, but the reserves exclude the part of the south-facing slopes of the Bénara-Tchaourembo ridge. The Réserve Forestière de Bénara lies to the south of Milma Bénara, but is almost if not entirely deforested, and is thus excluded from the site. Known threats are typical of forests on Mayotte, especially deforestation and hunting of pigeons.

**Further reading**

Benson (1960), Louette (1988a,c, 1999), Louette et al. (1993), Stevens and Louette (1999).

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**Site description**

The site comprises the coastal fringe of the large bay in south-west Mayotte. It extends from Poroani village (in the north) to Karoni hamlet, including the largest extent of mangrove on Mayotte (and indeed the Comoro archipelago), the landward strip adjacent to it, and also some intertidal mud. The strip is about 13 km long, and the mangrove belt reaches a maximum thickness of about 800 m. The landward side is cultivated with bananas and coconut, with a woodland of large trees (especially *Heritiera* sp. and *Erythrina* sp.) bordering the coast. The coastal plain is almost flat for up to 1.5 km inland. The towns of Chirongui and Tsmkoura lie a few hundred metres inland on this strip.

**Birds**

See Box and Table 2 for key species. Most of the forest-living birds of Mayotte occur. Of special importance at this site is the small population in the south (around Chirongui) of the restricted-range species *Foudia eminencissima*, which is otherwise poorly represented in the site inventory for Mayotte. Other species rare or absent from inland sites on Mayotte include the herons *Ardea idae* and *Butorides striatus* and most shorebirds. In addition to the species listed, the threatened *Ardea humboldtii* may occur as an occasional visitor.

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**Further reading**

Other threatened/endemic wildlife

Threatened ecosystem: mangrove (largest area in Comoro archipelago). Reptiles: Phelsuma robertsiertesi. No other data specific to this site.

Conservation issues

The mangroves are threatened by heavy sediment loads from the deforested interior; the extent of any wood-cutting is not known. This relatively remote coast is not immediately threatened by development for infrastructure or tourism.

Further reading


Site description

Choungui (594 m) is the peak that dominates the southern peninsula of Mayotte, and Sazilé is its south-easternmost headland. 4 km long with a sharp ridge up to 233 m high. This site contains the main forest block of the peninsula, which covers the conical peak of Mlima Choungui (down to around 400 m) and most of the catchment of the Mroni Bé river (east of Choungui, almost to sea-level), together with the unique, dry bushland and thicket on Sazilé. A road linking Moutsamoudou and Dapani villages separates these two areas. A few trails cross the area, but Sazilé is uninhabited and without roads.

BIBLIOGRAPHY


Other threatened/endemic wildlife

Threatened ecosystem: dry bushland and thicket with baobabs Adansonia digitata, not found elsewhere on Mayotte. Reptiles: Phelsuma geckos P. robertsiertesi, P. nigristriata and P. pasteuri. Sazilé is a nesting site for sea-turtles—Chelonia mydas (EN) definitely occurs, and probably also Eretmochelys imbricata (CR). No other data specific to this site.

Conservation issues

A very small part of the Choungui forest is protected in the Réserve Forestière de Chirongui, and Sazilé has protected status through the Conservatoire du Littoral in recognition of its importance for plants and turtles. Known threats are typical of forests on Mayotte, especially deforestation and hunting of pigeons.

Further reading
