

SEYCHELLES

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Seychelles Paradise-flycatcher
Terpsiphone corvina.
(ILLUSTRATION: DAVE SHOWLER)

GENERAL INTRODUCTION

The Republic of Seychelles has a total landmass of 455 km² spread across an Exclusive Economic Zone of around 1,374,000 km². It lies between c.04°S to 10°S and 46°E to 54°E in the western Indian Ocean, east of Africa and north to north-west of Madagascar. There are 155 islands listed in the Constitution of Seychelles which divide into two groups, the granitic islands, centred around Mahé and Praslin, and the outer islands, lying west and south-west of the granitic group. The granitics comprise a slightly larger landmass than the outer islands, but occupy a much smaller area of ocean. The highest point is Morne Seychellois on Mahé, at 914 m.

The climate is tropical and hence is hot and humid year-round with a low diurnal range in temperature. It is influenced by two wind systems, which are controlled by monsoonal wind shifts induced by pressure changes over the Indian Subcontinent, the Indian Ocean and Africa, combined with the influences of the South Indian Ocean subtropical anticyclone, ocean currents and sea temperatures. The south-east monsoon is relatively dry and blows from early May until October. It arrives several weeks earlier and peters out several weeks later in the southern, outer islands (the Farquhar and Aldabra groups) than it does in the granitics. Temperatures average 25°–30°C at sea-level during this period while humidity is around 80%. From late October to April the north-west monsoon blows. The wind is more erratic in direction and strength at this time, with slightly higher temperatures (up to 35°C), higher humidity and much higher rainfall. Heavy downpours may be experienced at any time of year in the granitic islands, but are more common during the north-west monsoon, reaching a peak between mid-December and the end of January. During transition periods (April and October) winds may die away completely and seas may be very calm.

Rainfall is higher in the mountainous granitic islands than in the flat coral islands due to the influence of relief. This is also true within the granitic group, with higher rainfall on Mahé than on neighbouring islands. Mean annual rainfall at Port Victoria, Mahé

is around 2,400 mm, while in the outer islands it is lower, varying from 1,500 mm in the Amirantes group to 1,000 mm on Aldabra. Aldabra has a considerably more marked dry season (average rainfall only 17 mm in September and October compared to nearly 300 mm at Port Victoria).

The total human population is approximately 80,000 of which 90% live on Mahé, the largest island, 7% on Praslin and nearly 3% on La Digue. Only 135 inhabit Silhouette, the third-largest granitic island, while only slightly more occupy the remaining 151 islands, most of which are small and uninhabited. There was no permanent human presence in Seychelles until 1770, when a French settlement was established. The islands were ceded to Britain in 1810. Independence in 1976 was followed by a coup d'état the following year, and the creation of a one-party state. Seychelles returned to multi-party democracy at elections held in 1993 and has subsequently enjoyed political stability and economic prosperity.

Colonization of the islands by man resulted in huge ecological trauma to the fragile ecosystems, as a result of intense habitat destruction (e.g. forest clearance, wetland drainage), the introduction of alien, invasive plants and predators (e.g. rats, cats) and unsustainable exploitation of the fauna. Much of the original vegetation on all islands was cleared for timber production or agriculture, particularly coconut plantations (for copra) throughout Seychelles and cinnamon exploitation in the granitics. These industries have now declined, having become uneconomic in the 1970s. Together with agriculture and traditional fishing, they used to be the major source of income, but have been replaced by tourism since the opening of Seychelles International Airport on Mahé in 1972. The fishing industry (mainly tuna) is now the second source of income, after tourism, for Seychelles.

There are no native land mammals in Seychelles though there are two species of bat. There are several species of skinks (6), geckos (13), chameleon (1), snakes (3), frogs (5) and caecilians (7), many of them endemic. Seychelles is also of extreme importance for two species of marine turtle, the hawksbill *Eretmochelys imbricata* (CR) and the green turtle *Chelonia mydas* (EN), that still occur in good

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

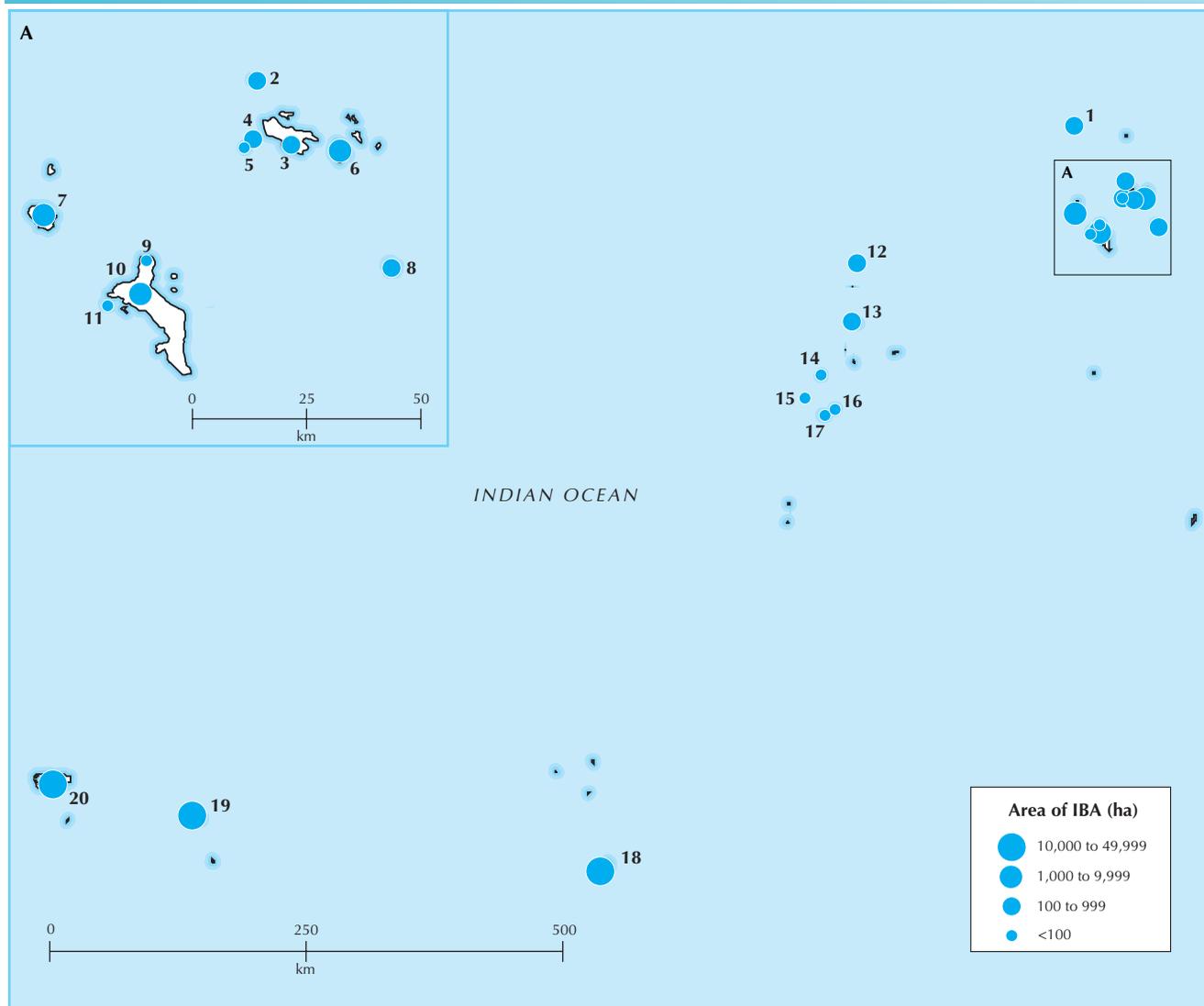


Table 1. Summary of Important Bird Areas in Seychelles.

20 IBAs covering 899.7 km²

IBA code	Site name	Administrative region ¹	Criteria (see p. 11; for A2 codes, see Table 2)					
			A1	A2 099	A2 100	A4i	A4ii	A4iii
SC001	Bird Island	—				✓		✓
SC002	Aride island	Praslin	✓		✓	✓	✓	✓
SC003	Praslin National Park and surrounding areas	Praslin	✓		✓			
SC004	Cousin island	Praslin	✓		✓	✓	✓	✓
SC005	Cousine island	Praslin	✓		✓	✓	✓	✓
SC006	La Digue island	La Digue	✓		✓			
SC007	Silhouette island	—	✓		✓			
SC008	Frégate island	—	✓		✓	✓		
SC009	Montagne Glacis	Mahé	✓		✓			
SC010	Mahé highlands and surrounding areas	Mahé	✓		✓			
SC011	Conception island	Mahé	✓		✓			
SC012	African Banks	—				✓		✓
SC013	D'Arros island	—	✓		✓			
SC014	Etoile island	—				✓		
SC015	Boudeuse island	—					✓	
SC016	Marie-Louise island	—				✓		✓
SC017	Desnoeufs island	—				✓		✓
SC018	Islets of Farquhar atoll	—				✓		✓
SC019	Cosmoledo atoll	—				✓	✓	✓
SC020	Aldabra atoll	—	✓	✓		✓	✓	✓
Total number of IBAs qualifying:			12	1	11	12	6	10

1. Other than for Mahé and its satellites, Praslin (and its small satellites) and La Digue, administrative regions are of limited applicability in Seychelles, since all other islands are effectively administered from Mahé.

numbers in the granitics and outer islands respectively. The estuarine crocodile *Crocodilus porosus* became extinct as a result of hunting pressure. Three species of giant tortoise endemic to the granitic islands were also presumed to be extinct, but recent research indicates the possible survival of two species *Dipsoschelys arnoldi* and *Dipsoschelys hololissa*.

■ Granitic islands

This group consists of 40 islands composed of granite, of which the largest are Mahé and Praslin, together with, for the sake of geographical convenience, two neighbouring islands of volcanic origin, Silhouette and North, and two coral cays on the edge of Seychelles Bank; Bird and Denis. Silhouette is composed of microgranite and syenite with some volcanic rocks while North consists mostly of syenite. The granitics are the only islands of continental rock found in mid-ocean, all other oceanic islands being volcanic or coralline. They are the oldest oceanic islands in the world, having separated from the western edge of the Indian Subcontinent during the break-up of the Gondwanaland supercontinent, some 65 million years ago. The rock is pre-Cambrian granite of around 750 million years of age. The syenite rocks of Silhouette and North are younger at around 63 million years, while the coral cays are extremely young, having emerged perhaps only 4,000 years ago, following a localized fall in sea-level due to a change in ocean currents (sea-level over Seychelles Bank is 4 m lower than on the Indian coast).

The great antiquity of the granitic group has resulted in a high level of floral and faunal endemism, with both African and Asian influences evident. The native vegetation is dominated by eastern, rather than western affinities, in both indigenous and endemic genera and species. On the larger islands (Mahé, Praslin, Silhouette, La Digue), exotic woody species used for timber or agriculture (cinnamon *Cinnamomum verum*, *Paraserianthes falcataria*, *Alstonia macrophylla*, assorted fruit trees, mahogany *Swietenia macrophylla*, etc.) have largely become dominant and pure stands of native forest are now restricted to patches, such as the famous coco-de-mer palm *Lodoicea maldivica* forest of the Vallée de Mai on Praslin. As a result, most of the 80 endemic plants of Seychelles are now classified as threatened.

The two native endemic mammals, the bats *Coleura seychellensis* (CR) and *Pteropus seychellensis*, are found here. Captive and wild populations of giant tortoises introduced from Aldabra are also found, as are two native species of terrapin, *Pelusios subniger* and *P. castanoides*. Reptile species endemic to the granitics include the rare tiger chameleon *Chamaeleo tigris*, two snakes (*Lamprophis geometricus* and *Lycognathophis seychellensis*), five species of skinks (*Mabuya* spp., *Janetaescincus* spp. and *Pamelaescincus gardineri*) and five species of geckos (*Phelsuma* spp., *Ailuronyx seychellensis* and *Urocotyledon inexpectata*). In addition, four endemic species of frogs (*Tachycnemis seychellensis*, *Nesomantis thomasseti* and *Sooglossus* spp.) and seven species of caecilians (*Grandisonia* spp., *Hypogeophis rostratus* and *Praslinia cooperi*) also occur. Many species of insects and other invertebrates (spiders, scorpions, snails, etc.), some of them endemic, are also found.

Only four islands larger than 20 ha, Cousin, Cousine, Aride and Frégate, have remained rat-free in the granitic archipelago. Important efforts to restore the ecosystems of these islands have been undertaken over the last 30 years, as they have been the refuge of several threatened endemic birds, important seabird colonies and other native flora and fauna (including a giant endemic tenebrionid beetle *Pulposipes herculeanus* (CR) on Frégate). Unfortunately, Frégate was colonized by *Rattus norvegicus* in 1995, but an attempt to eradicate it in 2000 appears to have been successful. Rats and cats also seem to have been eliminated on Curieuse and Denis in the same year in a programme coordinated by the Ministry of Environment and Transport. Rats were also successfully eradicated from Bird Island in 1996. These achievements will open the way for future transfer and establishment of new populations of threatened endemic birds.

■ Outer islands

The outer group are coralline islands of varying age situated to the west and south-west of Mahé. Closest, some 220 km west of Mahé, lies the Amirantes group. This is a linear archipelago of 26 islands on a shallow bank, the depth of water over which varies from 11 m

in parts of the rim to 70 m in the centre. None of the islands rise more than 3 m above sea-level. There is a basaltic base, dated at around 82 million years, less than 1 km below the surface, but no volcanic rocks are exposed. To the west lies the deep Amirantes trench. The Alphonse group to the south is sometimes included as part of the Amirantes chain; though separated by a deep channel, its three islands are similar in age and structure to those of the Amirantes. South-south-west of the Alphonse group lies the Farquhar group, which is closer to Madagascar than it is to Alphonse, and is 750 km south-west of Mahé. Some of these islands (e.g. Desnoeufts, Boudeuse, Etoile, most islands of Cosmoledo Atoll) have remained rat-free and host large seabird colonies.

In the extreme south-west of Seychelles lies the raised coralline islands of the Aldabra group, reaching 8 m above sea-level. Aldabra itself, the world's largest raised atoll has two terraces, one at 4 m and one at 8 m. These raised islands have emerged and submerged several times during their geological history, the last time being about 125,000 years ago. Levels of endemism are generally low on coral islands and this is true of the Amirantes, Alphonse and Farquhar groups. However, in the Aldabra group (which also includes Cosmoledo atoll, Assumption and Astove), levels of endemism are high, due largely to their greater age. On Aldabra, about 22% of 176 species of flowering plant are endemic (compared to no endemics on many of the younger coral islands east of Aldabra). There are also many endemic species of invertebrate. The terrain is rocky and dry, with mixed scrub dominated by *Pemphis acidula* and mangroves bordering the lagoon. In contrast to the granitic islands, the influences are more markedly from Madagascar and Africa. The outer islands are characterized by a very rich marine fauna, particularly the Aldabra group. This includes coral reefs and their fish communities, large sharks, turtles (*Chelonia mydas* and *Eretmochelys imbricata*) as well as pelagic cetaceans.

After being heavily exploited until the beginning of the twentieth century, the unique and spectacular Aldabra Giant Tortoise *Dipsoschelys dussumieri* again became abundant on the atoll, with c.100,000 in 1997. An endemic species of gecko (*Phelsuma abbottii*) is found on Aldabra and Assumption. A subspecies of fruit bat, *Pteropus mayottensis aldabranus*, is restricted to Aldabra. Because of its remote location and harsh conditions the exceptional fauna and flora of Aldabra has remained well preserved and the atoll was declared a Special Reserve in 1982.

ORNITHOLOGICAL IMPORTANCE

By the end of 2000, 224 bird species had been recorded in Seychelles (Skerrett and the Seychelles Bird Records Committee 2001). These comprise resident landbirds and waterbirds (48 species), breeding seabirds (18 species), annual migrants (24 species), occasional visitors (127 species) and extinctions (seven species).

Seychelles is of great ornithological interest. It has 30 currently recognized endemic forms of land- and waterbird, including 12 terrestrial species, which show biogeographic influences from Africa, Asia and Madagascar (Stoddart 1984). Eleven species of global conservation concern occur, which include nine of the endemic landbirds, eight of them on the granitics (see below), while one other is an endemic warbler from Aldabra, *Nesillas aldabranus*, which has not been seen since 1983 and is now considered extinct. The final species is *Ardeola idae* (NT), which breeds on the Aldabra. The whole of two Endemic Bird Areas (EBAs) fall within Seychelles. These are the Granitic Seychelles (EBA 100) with 11, and Aldabra (EBA 099) with three extant restricted-range species, respectively.

Other taxa that have become extinct in historical times include *Psittacula eupatria wardii*, *Zosterops (mayottensis) semiflava*, *Streptopelia picturata saturata* and, probably, a species of *Porphyrio*. Landbird populations, dependent on habitat availability and food-supply within relatively small areas, would never have been very numerous and, although losses appear to have been smaller than on Mauritius or Réunion, ornithological recording in Seychelles was negligible until Newton's visit in 1865. By this time, almost a century after first settlement began, habitats had already been extensively altered, such that additional extinctions of undescribed species may well have happened undetected.

Following numerous introductions of alien bird species by man, the landbird communities of most of the granitics (other than of a few small islands) and most of the outer islands (with the notable exceptions of Aldabra, Cosmoledo and Astove) are dominated by introduced species (c.12 currently breeding in the wild).

Another important feature is the large concentrations of breeding seabirds. Some colonies regularly host more than one million birds and are among the largest in the Indian Ocean or, e.g. for *Fregata* spp., in the world. It is likely that, prior to the arrival of man, seabird populations were limited more by the availability of nest-sites than by food. A rare booby, *Papasula abbotti* (VU), used to breed on Assumption, but disappeared at the beginning of the century due to destruction of habitat by phosphate mining.

Seychelles is not situated along any important migration route, as most of the flyways from India to Africa or Madagascar cross the Red Sea or the Indian Ocean further north. However, many migratory species, especially waders, occur regularly. Some of these migratory birds show site fidelity to Seychelles as wintering or stop-over sites (e.g. one *Arenaria interpres* ringed on Cousin in 1981 was controlled near the Aral Sea in 1983 and recorded again on La Digue in 1985). Few species of wader, other than *Arenaria interpres* and *Dromas ardeola*, occur in concentrations of international importance.

The granite islands and the outer islands may be considered two distinct biogeographical regions.

■ Granitic islands

The granitic islands are home to eight landbird species of global conservation concern, all endemic to the islands, of which four are classified as Critically Endangered. *Copsychus sechellarum* (about 100 birds in 2001) was restricted to Frégate until 1995, but small breeding populations have now been established on Cousin and Cousine. *Zosterops modestus* (about 300 birds) is restricted to Mahé and Conception (Rocamora and François 2000) with the latter, probably representing more than 80% of the world population, only discovered in 1997. *Terpsiphone corvina* (69–83 pairs; 150–200 birds) is now present mainly on a single island, La Digue, and no longer occurs on Praslin. However, the species was found in small numbers on Marianne in 1997 (Ladouceur 1997, Parr 1998). *Otus insularis* (90–180 pairs) is restricted to the mountains of Mahé.

The other four species are classified as Vulnerable. *Acrocephalus sechellensis*, once close to extinction and down to 26–29 birds on Cousin when censused in 1959 (Crook 1960), has benefited from habitat restoration and successful translocations to Aride and Cousine. It numbers now more than 2,000 individuals, 80% of them

on Aride. *Foudia sechellarum*, is restricted to Cousin (1,000 birds), Cousine (560 birds) and Frégate (c.500–1,500 birds) and its total population is probably over 2,400 individuals (including a population on D'Arros in the outer islands). *Falco araea* has a total population of about 430 pairs, most of them on Mahé and its satellite islands. It is also present on Silhouette and North and has been reintroduced to Praslin. The cave nesting *Collocalia elaphra* (= *Aerodromas elaphrus*) is only present on Mahé, Praslin and La Digue with a total population of over 3,000 individuals. The rare *Coracopsis nigra barklyi*, is also of great conservation concern. A genetic study to reassess its taxonomic relationship with the other subspecies on Madagascar appears called for, as there are considerable differences in size and voice. It is present only on Praslin and Curieuse and its numbers are estimated at 200–300 individuals.

In addition, three other restricted-range species are found on the granitic islands, *Hypsipetes crassirostris*, common but only present on Mahé, Praslin, La Digue and Silhouette, *Nectarinia dussumieri*, also common, and *Alectroenas pulcherrima*, which has become much more abundant over the last 20 years, following the cessation of persecution.

The endemic subspecies *Streptopelia picturata rostrata* is now almost totally interbred with nominate *picturata*, of uncertain origin, but which is presumed to have been introduced from Madagascar, and only a few birds with the characteristics of *rostrata* can be found on Bird, Cousine, Cousin and Aride.

The presence of *Ixobrychus sinensis* on Mahé, Praslin, La Digue and Curieuse is of particular interest. The Seychelles is the only place in the African and Western Indian Ocean regions where this Asian species can be found. It is thought that the total the population is fewer than 100 pairs. There are two endemic subspecies of waterbirds in the granitics, *Butorides striatus degens* and *Bubulcus ibis sechellarum*.

Seabird colonies of regional and global importance in the granitic islands are found on Aride, Cousin, Cousine and Bird. These include *Puffinus pacificus* (c.60,000 pairs shared between Cousin, Aride, and Cousine, which holds the largest colony), *Puffinus lherminieri nicolae* (c.60,000 pairs, mainly on Aride), *Anous tenuirostris* (300,000 pairs on Aride, Cousin and Cousine), *Anous stolidus* (>15,000 pairs on Aride, Cousin, Cousine and Bird), *Gygis alba monte* (11,000–15,000 pairs, mainly on Aride, Cousin, Cousine and Bird, but also in low numbers on other granitics), *Phaethon lepturus* (minimum 2,500 pairs on Cousin, Cousine and Aride, but also in low numbers on other granitics), *Sterna fuscata* (400,000–600,000 pairs on Bird and 150,000–300,000 pairs on Aride), *Sterna anaethetus* (c.2,000 pairs) and *Sterna dougallii* (c.1,000 pairs; in the granitics now present only on Aride).

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

099 – Aldabra Endemic Bird Area (four species in Seychelles; one site meets the A2 criterion)												
IBA code:												020
<i>Alectroenas sganzini</i>												✓
<i>Nesillas aldabrana</i> ¹												✓
<i>Foudia eminentissima</i>												✓
<i>Dicurus aldabranus</i>												✓
Number of species recorded:												4
1. Last seen 1983; considered extinct.												
100 – Granitic Seychelles Endemic Bird Area (11 species in Seychelles; 11 sites meet the A2 criterion)												
IBA code:	002	003	004	005	006	007	008	009	010	011	013	
<i>Falco araea</i>		✓				✓		✓	✓	✓		
<i>Alectroenas pulcherrima</i>		✓			✓	✓	✓		✓	✓		
<i>Otus insularis</i>											✓	
<i>Collocalia elaphra</i>		✓			✓			✓	✓			
<i>Hypsipetes crassirostris</i>		✓			✓	✓		✓	✓			
<i>Copsychus sechellarum</i>			✓	✓			✓					
<i>Acrocephalus sechellensis</i>	✓		✓	✓								
<i>Terpsiphone corvina</i>					✓							
<i>Nectarinia dussumieri</i>		✓			✓	✓	✓	✓	✓			
<i>Zosterops modestus</i>									✓	✓		
<i>Foudia sechellarum</i>			✓	✓			✓				✓	
Number of species recorded:	1	5	3	3	5	4	4	5	7	3	1	

■ Outer islands

On the outer islands native landbird species survive only in the Aldabra group. Elsewhere, all are non-native species introduced by man. An endemic subspecies of turtle dove *Streptopelia picturata saturata*, now extinct, was described from the Amirantes group, and there is a record of a small blue pigeon from St Pierre and Providence that was extirpated before it could be described. On D'Arros (Amirantes) there is a small population of *Foudia sechellarum* (200–300 birds), derived from five birds taken from Cousin and introduced there by a Bristol University Expedition in 1965.

Aldabra landbirds include two endemic species, the near-threatened *Dicrurus aldabranus*, whose numbers were estimated at 1,500 birds in 1985, and *Nesillas aldabrana*, now probably extinct. There are also 10 endemic subspecies. These include forms of two common restricted-range species, *Alectroenas szanzini minor* and *Foudia ementissima aldabrana*, and two birds characteristic of Aldabra, *Threskiornis aethiopica abbotti* (100–250 pairs) and the last flightless bird in the western Indian Ocean *Dryolimnas cuvieri aldabranus* (1,500–2,700 pairs). The other six subspecies are *Streptopelia picturata coppingeri* (common), *Centropus toulou insularis* (frequent), *Caprimulgus madagascariensis aldabrensis* (frequent), *Hypsipetes madagascariensis rostratus* (common), *Nectarinia sovimanga aldabrensis* (common) and *Zosterops maderaspatana aldabrensis* (common). A further four endemic subspecies are found in other islands of the Aldabra group; *Nectarinia sovimanga abbotti* (Assumption), *N. s. buchenorum* and *Zosterops maderaspatana menaiensis* (Cosmoledo and Astove) and a turtle dove found only in small numbers on South Island, Cosmoledo (Mortimer 1984, Mortimer and Constance 2000) which has been assumed to be the same subspecies as that on Aldabra, but may be an undescribed race (Rocamora and Skerrett, submitted). In addition, the taxonomic status of *Dryolimnas cuvieri aldabranus*, *Threskiornis aethiopica abbotti*, *Foudia ementissima aldabrana*, *Nectarinia sovimanga abbotti* and *N. s. buchenorum* are probably all worthy of further review.

Ardeola idae (NT) occurs on Aldabra in small numbers (probably 20–50 pairs only). *Egretta dimorpha*, restricted to the western Indian Ocean, is common (possibly several thousand pairs). There is also a small population of 25–50 *Phoenicopiterus ruber roseus*, which bred successfully on Aldabra in 1995, although only one chick was known to have fledged. Important colonies of *Ardea cinerea* occur on Providence (>1,000 pairs) while *Butorides striatus crawfordii* is endemic to the outer islands. Between 1,500 and 3,000 *Dromas ardeola* and 500–1,000 *Arenaria interpres* are observed regularly on Cosmoledo, Aldabra and St François.

The outer islands hold a large number of seabird colonies of global and regional importance. Species of interest include *Puffinus lherminieri* on Aldabra (50–100 pairs), *Puffinus pacificus* (thousands of pairs on Desnoeufts and Boudeuse), *Sula sula* (minimum 21,000 pairs on Cosmoledo and Aldabra), *Sula dactylatra* (8,000–11,000 pairs on Cosmoledo, Boudeuse and Desnoeufts), the locally rare *Sula leucogaster* (c.60 pairs on Cosmoledo), *Fregata minor* (4,000 pairs on Aldabra and 10–20 pairs on Cosmoledo), *Fregata ariel* (6,000 pairs on Aldabra), *Phaethon rubricauda* (2,000 pairs on Aldabra and Cosmoledo), *Phaethon lepturus* (2,500 pairs, mainly on Aldabra), *Sterna caspia* (4–8 pairs on Aldabra), the rare *Sterna sumatrana* (up to 500 pairs, mainly on Aldabra, Cosmoledo, Farquhar and Providence), *Sterna dougallii* (180–280 pairs on Etoile and African Banks), *Sterna fuscata* (c.2,000,000 pairs, mainly on Cosmoledo, Desnoeufts and Farquhar, with smaller numbers on African Banks and Etoile), *Sterna bergii* (260–700 pairs, mainly on Aldabra, Cosmoledo and Providence), *Gygis alba* (several thousand pairs, mainly on Aldabra, Marie-Louise, Providence) and *Anous stolidus* (7,000–15,000 pairs, mainly on Aldabra, D'Arros, Desnoeufts, Marie-Louise and Boudeuse).

CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

The government agency responsible for all environmental matters and the conservation of fauna and flora is the Ministry of Environment and Transport. The main laws covering nature protection in Seychelles are: The Wild Animals and Birds Protection

Act (1961), which defines the basic regulations for the protection and conditions for the exploitation of species including The Wild Birds Protection Regulations (1966) and The Wild Birds Protection (Nature Reserve) Regulations (1966); The National Parks and Nature Conservancy Act (1969), which sets out the different types of protected areas and their regulations; The Animals Disease and Imports Act (1981), of particular importance in Seychelles as it regulates the importation of exotic species; and The Environment Protection Act (1994), which covers issues relevant to Environmentally Sensitive Areas, Environment Impact Assessment regulations, pollution control etc.

All these acts have, since being gazetted, been periodically reviewed and updated. For example in 1996, the *Atlas des Zones d'Environnement Sensible des Seychelles* (Environmentally Sensitive Areas of Seychelles) (Duncombe 1996) was published by the then Ministry of Environment and endorsed under the Environment Protection Act in November 1996.

There are four main categories of protected area relevant to bird conservation in Seychelles:

- **Special Reserves:** there are four Special Reserves in Seychelles. These are Aride island, Cousin island, Aldabra atoll and La Veuve Reserve on La Digue. The first two were declared in 1975, the others in 1981 and 1991 respectively. This category provides the strongest level of protection for wildlife and its habitat, since all human activities except nature conservation and restricted ecotourism are banned.
- **Terrestrial National Park:** two sites fall under this category, Morne Seychellois National Park and Praslin National Park (which includes the Vallée de Mai palm forest), both gazetted in 1979. These are the largest protected areas of land in the granitic islands. Their long term objectives are to conserve the indigenous flora and fauna, the water resources and the landscape and to develop their tourist potential. Some controlled and limited human activities (agriculture, forestry) are permissible under a system of zonation, but construction and all other kinds of development are theoretically banned.
- **Marine National Parks:** there are six Marine National Parks, Sainte Anne, Baie Ternay, Curieuse, Port Launay, Silhouette and Ile Cocos. Their main objective is to protect marine life, but they also benefit seabirds and shorebirds. Fishing is generally banned in these areas, while diving and yachting are strictly controlled. All Marine National Parks are now managed by the Marine Parks Authority, a parastatal body.
- **Nature Reserves:** a further seven Nature Reserves, five in the granitics (Ile Sèche, Ile aux Vaches Marines, Ile aux Fous, Mamelles and Vallée de Mai) and two in the Amirantes (Boudeuse, Etoile), were declared for the protection of breeding seabirds under the The Wild Birds Protection (Nature Reserve) Regulations (1966). Unfortunately, protection only exists on paper for some of these sites, which have lost a major part of their ornithological interest due to poaching and disturbance.
- **Other protected areas:** one site, African Banks and its surrounding reefs, was designated as an area of restricted access in 1987, as were three other small islands since combined into a new marine park, Ile Cocos, in 1996.

In addition, other categories of protection exist. These include Strict Natural Reserve, where all human activity is forbidden (no site yet designated), Areas of Natural Outstanding Beauty (no site yet designated) and Areas for the Protection of Landscape (Anse Lazio and Sainte Anne). In the latter, developments are restricted and must be harmonious with fauna and flora and the general beauty of the landscape. In Environmentally Sensitive Areas (Duncombe 1996), developments are to be restricted and based on prior environmental impact assessment.

Projected additional protected areas include a Nature Reserve on Conception, the extension of La Veuve Reserve on La Digue (including the acquisition of marshland and native forest) and the enlargement of both Morne Seychellois and Praslin National Parks. Some kind of protective status is also being discussed for Silhouette island, for which a management plan has been written by the NPTS and IDC. The protected area network of Seychelles includes all main habitat-types other than freshwater wetlands, which deserve much greater conservation attention.

In addition, there are other sites, currently unprotected by law, which are privately conserved. For example, efforts to rehabilitate two privately-owned islands, Cousine and Frégate, were started in the 1980s. Cousine is currently managed as a wildlife sanctuary and Bird and D'Arros also benefit from environmentally-friendly management, since one of their main attractions to tourists is their fauna and flora. Conducted on a small scale and carefully controlled, tourism on these islands is proving a valuable asset to conservation as well as acting as a deterrent to poachers and uncontrolled visitors. In an attempt to make collection sustainable, half of the *Sterna fuscata* breeding colony on Desnoeuvs, where exploitation of eggs takes place, has been set up as a reserve (although this has no legal status). Controlled egg-collection allows permanent wardening against poaching and the killing of adults, but the commercialisation of the eggs is controversial as it is thought it might sustain public demand, which would otherwise disappear.

Environmental legislation is generally good in Seychelles, but its enforcement has been rather poor. Poaching remains a problem throughout the islands, including on Nature Reserves. Where logistic and economic considerations have precluded the possibility of wardening a protected site, poachers have operated with impunity. This is particularly acute in the outer islands.

There are many other threats to birds and their habitats in Seychelles. These include introduced plants and animals. Some introduced animals (*Rattus* spp., *Felis catus*, *Acridotheres tristis*, *Tyto alba*) have seriously reduced the populations of some endemic species through the predation of eggs, chicks and adult birds; several species are restricted to predator-free islands in consequence. Competition from introduced birds for food and other resources is also a problem. The introduction and spread of invasive plants has an indirect negative effect through habitat modification. Habitat loss has been and is still an important threat, especially in the granitic islands, where the expansion of the human population, combined with the tourist industry, puts increasing pressure on coastal habitats, including clearance of woodland and drainage of marshes for housing and other developments. Disturbance both from poachers and uncontrolled tourism also significantly affect the breeding success of some species, particularly seabirds. Although as yet little studied, there is also a risk that industrial fishing, by reducing the abundance of predatory fish such as tuna, may affect the food-supply for pelagic seabird species, which often feed on small fish forced to the surface when hunted by larger ones. A further threat comes from global warming and the resultant rise in sea-levels, which would severely impact upon all outer islands, as well as Bird and Denis.

The detrimental effects consequent on the colonization of the islands by man are probably irreversible on the larger islands, but on the smaller ones, where ecological conditions can more easily be controlled, restoration of the indigenous habitats, including predator eradication and the reintroduction of native species, is possible and being actively promoted by the different conservation bodies operating in the country. Small islands are extremely important for the conservation of Seychelles' native biodiversity.

INTERNATIONAL MEASURES RELEVANT TO THE CONSERVATION OF SITES

Seychelles is a contracting party to the Convention on Biological Diversity, CITES, the Convention to Combat Desertification, the Convention on Climate Change and the World Heritage Convention, under which two sites, Aldabra atoll and Vallée de Mai, have been designated. Regionally, Seychelles has ratified the African Convention on the Conservation of Nature and Natural Resources and the Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region. It is also signatory to many other environmental agreements and conventions including the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and the Convention for the Prevention of Pollution from Ships, MARPOL.

OVERVIEW OF THE INVENTORY

The inventory comprises 20 Important Bird Areas (IBAs), 11 in

the granitic islands and nine in the outer islands, which cover 237.5 km² of land (76.5 km² in the granitics and 161 km² in the outer islands), representing 52.2 % of the total landmass of the country (Map 1, Table 1). In addition, 662.2 km² of marine habitats, (lagoons and coastal zones), are also included. Six of the 20 sites were, at the end of 1999, fully protected by law, with two others partially protected and these, between them, cover 18,911 ha, or 76 % of the land area of the IBA network. This high proportion is partly due to Aldabra, which alone covers 61.6 % of the area and 33.8 % of the whole country. With Aldabra excluded, however, the ratio is still 21%. The other 12 sites are not legally protected although some are privately preserved. All IBAs fall wholly or partly within the Environmentally Sensitive Areas identified in the *Atlas des Zones d'Environnement Sensible des Seychelles* (Duncombe 1996).

The 20 IBAs fall into four groups. The three sites on Mahé and Praslin, plus Silhouette and La Digue, retain important populations of one or more of the globally threatened endemics as well as significant populations of several other restricted-range species (Table 2). Five small granitic islands (Cousin, Cousine, Aride, Conception and Frégate) also hold one or more globally threatened, restricted-range species; between them these 10 sites therefore hold all 11 species of the Granitic Seychelles EBA (Table 2). Cousin, Cousine, Aride, Frégate and Bird also hold important seabird colonies. The seven small outer islands and atolls host concentrations of breeding seabirds and waterbirds of international importance. Finally, there are the two large atolls, Aldabra and Cosmoledo, which qualify for the numbers of sea- and waterbirds they hold and, in the case of Aldabra, for the species of global conservation concern and for the three extant restricted-range species that occur (Table 2). Seventeen of the sites are entire islands or atolls, while the remaining three are delimited areas on Mahé and Praslin.

The IBAs on Mahé, Praslin and La Digue, the three islands where almost all the human population is concentrated, are most at risk from habitat destruction as a result of development and tourism projects. The major threat to the small granitic island IBAs is invasion by alien predators such as rats. On the outer islands IBAs, where development projects are limited, the main threats are from poaching and disturbance from uncontrolled tourism.

Due to difficulties of access, relatively few visits have been made by ornithologists during the last 25 years to most of the outer islands, which means that information for these sites is, overall, not as accurate or up to date as it is for the granitics, where information is generally recent and the data quality is good. Nevertheless, additional work is required at some sites in the granitics to obtain more reliable information on the status of several species, as well as, for example, more data regarding the presence of *Terpsiphone corvina* on Marianne island.

An additional six sites are included in a 'shadow list' of potential IBAs. Three of these are in the outer islands, Bancs du Sud (Providence atoll), Saint François/Bijoutier atoll and St Joseph atoll, for which there is currently insufficient information on the numbers of seabirds and waterbirds that occur on them to assess whether they merit IBA status. One site in North Praslin contains the second most important population of *Coracopsis nigra barklyi* (33–55 birds) as well as 4–8 pairs of *Ixobrychus sinensis*, while the remaining two are wetlands sites on Mahé, North-east Point Marsh and Police Bay Marsh, each of which also holds, among other species, 4–8 pairs of *I. sinensis*.

A further five small granitic islands would, in the past, have fulfilled IBA criteria for their numbers of breeding seabirds, but no longer do so, mainly due to decades of severe poaching and other human disturbance. Three of these, Ile Sèche, Ile aux Vaches Marines and Mamelles, have the status of Bird Reserves, but there is no wardening or law enforcement. Seabird populations on these islands, together with those on the unprotected Ile Récif and L'Ilot Frégate, might recover if poaching and disturbance were controlled. This may also be true, for the same reasons, of St Pierre and Astove in the outer islands.

Finally, some sites may achieve IBA status within the next 10 years if habitat restoration, under way and planned, and reintroductions of endemic species are successful. These include Curieuse island, North Island, Thérèse island, Denis island, Alphonse atoll, Assomption island, Astove atoll and, possibly, others.

COMMENTS ON THE INVENTORY

- Information on population sizes for the granitic islands is recent (1995–1999), and generally of good reliability (high or medium). Figures for terrestrial species were obtained from direct counts or from estimates using line-transect or point-count techniques. The minimum/maximum figures given indicate the extent of uncertainty and do not represent statistical confidence intervals. Exceptions to this, however, are the figures for *Foudia sechellarum* on Cousine and Cousin and for *Collocalia elaphra* at Montagne Glacis, obtained by capture-recapture methods, which do correspond to 5% confidence intervals of the resulting estimates. Minimum/maximum figures given for seabirds on Cousin and Aride correspond to the $P < 0.05$ confidence interval of the 1999 population estimates, derived from quadrats or transect counts.
- For the outer islands, population estimates (mainly of seabirds and waterbirds) are generally of medium or low reliability, except for Aldabra, Cosmoledo and Desnoeuvs, where the data are more accurate. Data used are the most recent available estimates (1994–1999). However, for a number of sites these are only very approximate. The minimum/maximum figures given indicate the extent of uncertainty. Reliable estimates from the 1970s and 1980s have been used where no more recent figures are available (e.g. frigatebirds and boobies on Aldabra). Statistical confidence limits have not been used for Aldabra or Desnoeuvs.

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GLOSSARY

- COI** Commission de l’Océan Indien.
glacis characteristic large areas of smooth bare granite, found on the slopes of the granitic islands.
ICBP International Council for Bird Preservation (now BirdLife International).
IDC Island Development Company.
MPA Marine Parks Authority.
MET Ministry of Environment and Transport.
MoT Ministry of Tourism.
NPTS Nature Protection Trust of Seychelles.
plateau low-lying plain adjacent to the sea.
RSNC Royal Society for Nature Conservation.
RSPB Royal Society for the Protection of Birds, the BirdLife Partner in the UK.
SBC Seychelles Broadcasting Corporation.
SIF Seychelles Islands Foundation.

SITE ACCOUNTS

Bird Island

Admin region Ile aux Vaches

Coordinates 03°43'S 55°12'E

Area 101 ha Altitude 0–4 m

SC001

A4i, A4iii

Unprotected

Key species

A4i		Breeding (pairs)	Non-breeding
	<i>Sterna fuscata</i>	300,000–600,000	—
	<i>Anous stolidus</i>	c.10,000	—
A4iii	More than 20,000 waterbirds are recorded regularly at this site.		

Site description

Bird Island is a sandy cay rising only a few metres high, situated on the northern edge of Seychelles Bank about c.100 km north-west of Mahé. It is very young, perhaps having emerged no more than 4,000 years ago. The island was sparsely vegetated and supported large numbers of seabirds until the end of the nineteenth century. Coconut-palms *Cocos nucifera* were then planted over most of the island, but were partly cleared after 1967 to encourage the breeding of *Sterna fuscata*. About 70% of the island is now covered with mixed woodland. This includes the remaining coconut plantation, areas planted with *Casuarina equisetifolia* and *Pisonia grandis* forest that has been allowed to regenerate in the centre of the island. Main human activities are tourism (there is a small hotel served by plane from Mahé), small-scale fisheries and aquaculture.

Birds

See Box for key species. The island supports a huge and increasing breeding colony of *Sterna fuscata*. More than one million are present during the breeding season between April and October; the species is rare or absent the rest of the year. There is also a large colony of *Anous stolidus*. Other breeding species include *Puffinus pacificus* (uncommon), *Gygis alba* (720 pairs), *Anous tenuirostris* (300 pairs, increasing) and *Phaethon lepturus* (10–20 pairs). A population of *Streptopelia picturata* (30–60 individuals) is also present, with many individuals showing characteristics of *rostrata*. Non-breeding visitors include more than 250 *Sterna saundersi* and 5,000 *S. anaethetus*.

Other threatened/endemic wildlife

The island hosts one species of skink and one species of gecko endemic to Seychelles. Green turtles *Chelonia mydas* (EN) nest in larger numbers than elsewhere in the granitic islands and hawksbill turtles *Eretmochelys imbricata* (CR) also breed; numbers of both are monitored. A small number of the giant tortoise *Dipsochelys dussumieri* have been introduced.

Conservation issues

The island was declared a wildlife sanctuary by the owner in 1986, but it does not have any legal protected status. Its management is oriented towards both conservation and tourism. Grass is burnt every year in March–April to improve nesting habitat for *Sterna fuscata*. The colony is not now exploited for commercial egg production, although some egg-collection by residents for personal consumption occurs. A long-term research programme on *Sterna fuscata* colony began since 1972 and a study of *Anous stolidus* was completed recently. Rats were eradicated in 1996 and it has been suggested the island is potentially suitable for the translocation of threatened endemics sensitive to rat predation. Unfortunately, in 1998 the island suffered an invasion of introduced crazy ants *Anoplolepis gracilipes*, which infested the *Sterna fuscata* colony. Programmes to eradicate the ants are being conducted. Because of its isolation, Bird Island may be the best place to maintain a population of *Streptopelia picturata* of the endemic race *rostrata* before it completely disappears. Beach erosion is a cause for concern.

Further reading

Feare (1976a, b, 1979, 1984a, b), Feare and Gill (1995), Feare *et al.* (1997), Fryer (1910).

Aride island

Admin region Praslin

Coordinates 04°13'S 55°40'E

Area 173.3 ha Altitude 0–135 m

SC002

A1, A2 (100), A4i, A4ii, A4iii

Special Reserve

Site description

Aride (68.3 ha) is the most northerly of the granitic islands, lying 9 km north of Praslin and 45 km north-east of Mahé. The site also includes 105 ha of coastal marine habitat. A ridge of Precambrian granite, rising to 135 m, dominates a small plateau of 9 ha. There is a single beach 800 m long on the southern side of the island while the rest of the coastline is composed of cliffs and rocky shore. The island is densely covered with mixed native woodland dominated by *Pisonia grandis*, *Ficus lutea* and *F. reflexa*. Granite outcrops and open glades are abundant on the hill, where there are also smaller areas of *Euphorbia pyrifolia* scrub. A young, managed woodland, replanted with indigenous species (*Callophyllum inophyllum*, *Terminalia catappa*, *Morinda citrifolia*, etc.), and a small wetland, are present on the plateau. Human activities are limited to nature conservation, research and ecotourism (day visits and confined to main paths only). Most of the former coconut plantation has been progressively eliminated and the only remaining agricultural activity is restricted to a small garden for resident staff. Coral reefs surround the island.

Birds

See Box and Table 2 for key species. With approximately one million breeding seabirds of 10 species, Aride island holds one of the most important seabird colonies of the Indian Ocean. In addition to the tern species listed below, 71–89 pairs *Sterna anaethetus* also breed. Aride also hosts the largest known population in Seychelles of *Puffinus lherminieri nicolae* and is the most northerly breeding site for *Phaethon rubricauda* (3–5 pairs). Important numbers of *Puffinus pacificus* also occur from September to March. Seabird numbers are largest during the south-east monsoon, from May to October, the breeding season for many species. However, *Phaethon lepturus*, *Gygis alba*, *Puffinus lherminieri* and *Sterna anaethetus* may nest all year-round. Mixed, non-breeding flocks of *Fregata minor* and *F. ariel* are regularly seen roosting or soaring over the island (up to 4,600 birds between November and February). Landbirds include *Acrocephalus sechellensis*, originating from 29 birds introduced from Cousin in 1988. With a minimum of 1,600 birds present in 1997, the majority of the world population now occurs on Aride. Several attempts to re-establish a breeding population of *Copsychus sechellarum* have not so far succeeded (one pair still present in 2001). *Nectarinia dussumieri* (min. 49 birds) and *Alectroenas pulcherrima* (min. three pairs) have recolonized the island naturally. *Streptopelia picturata picturata* (200–400 birds) and *Gallinula chloropus* (200–400 birds) are also present.

Key species

A1	<i>Acrocephalus sechellensis</i>		
A2 (100)	Granitic Seychelles EBA: One of the 11 species of this EBA has been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Sterna dougallii</i>	1,100–1,300	—
	<i>Sterna fuscata</i>	261,000–366,000	—
	<i>Gygis alba</i>	3,900–5,900	—
	<i>Anous stolidus</i>	4,400–11,600	—
	<i>Anous tenuirostris</i>	136,000–197,000	—
A4ii	<i>Puffinus pacificus</i>	8,700–28,400	—
	<i>Puffinus lherminieri</i>	43,000–72,000	—
	<i>Phaethon lepturus</i>	276–972	—
A4iii	More than 20,000 waterbirds and 10,000 pairs of seabirds are recorded regularly at this site.		

Other threatened/endemic wildlife

There are eight resident reptile species, of which seven are endemic (including *Mabuya wrightii* and *M. sechellensis* at extremely high densities). Among the large invertebrate fauna, the whip scorpion *Phrynicus scaber* is present in good numbers. The turtles *Eretmochelys*

imbricata (CR) and, occasionally, *Chelonia mydas* (EN) nest on the beach. Of the 100 vascular plants recorded on the island, *Rothmannia annae* is now restricted to Aride, as may be the *Peponium* sp. (taxonomy uncertain).

Conservation issues

Aride was purchased by Christopher Cadbury in 1973 on behalf of the RSNC to be managed as a wildlife sanctuary. It was declared a Special Nature Reserve by government in 1979 and its boundary extends 200 m offshore. The reserve is funded through sponsorship, tourism and an endowment fund. The island is rat-free and although mice are present their impact is thought to be minor. The management plan includes the future re-establishment of other endemic species historically present, including *Terpsiphone corvina* and *Coracopsis nigra barklyi*. Aride has the longest continuous bird-monitoring programme of any island in Seychelles. Research programmes (e.g. on *Sterna dougallii*, *Phaethon lepturus* and *Acrocephalus sechellensis*) are conducted by the island staff and graduate volunteers in collaboration with different conservation bodies and universities. A *Tyto alba* eradication programme is in progress. Colonization of the island by alien predators, especially rats, is the main threat. Poaching of seabirds, including of eggs, for food and for sale still occurs and may be significant.

Further reading

Betts (1997, 1998), Bowler and Hunter (1999), Bullock (1989), Carty and Carty (1996), Carty and Herzig (1995), Castle and Mileto (1991a, b), Cuthbert and Denny (1995), Komdeur *et al.* (1997), Lidstone-Scott (1993), Lucking and Ayrton (1996), Millett *et al.* (1999), Ramos (1998), Warman (1979), Warman and Todd (1984).

Praslin National Park and surrounding areas

Admin region Praslin

Coordinates 04°20'S 55°44'E

Area c.700 ha Altitude 0–367 m

SC003

A1, A2 (100)

National Park, World Heritage Site,

Unprotected

Site description

This site is situated in the southern half of Praslin and extends from sea-level in the south to the highest point on Praslin (367 m). It includes Praslin National Park (330 ha). Most of the hill-slopes of the site are covered by a secondary mixed forest with a high proportion of native species, mainly palms. This includes the magnificent palm forest of Vallée de Mai, dominated by the coco-de-mer *Lodoicea maldivica* (the famous female pelvis-shaped nuts of which are the biggest seeds of the plant kingdom), and all five of the other endemic palms of Seychelles, including *Verschaffeltia splendida*, *Deckenia nobilis* and *Phoenicophorium borsigianum*. Other notable endemics include *Secamone schimperianus* and *Drypetes riseleyi*. The Fond d'Azore and Fond d'Albaretz areas retain much endemic flora (*Dillenia ferruginea*, *Northea hornei*, *Pandanus* spp., etc.). A few forestry plantations of *Swietenia macrophylla* also occur. There are numerous small streams and waterfalls. The south-eastern part of the IBA contains drier areas with shrubs, boulders and caves. Fires have affected the site in the past. Much of the site is now no longer used for anything other than nature conservation, tourism being restricted mainly to the coast and the Vallée de Mai.

Birds

See Box and Table 2 for key species. This IBA is also of vital importance for *Coracopsis (nigra) barklyi*, as it represents its main breeding and feeding area. Restricted to Praslin and Curieuse, it is the national bird of Seychelles. The total Seychelles population is estimated to be between 200–300 birds (fewer than 100 pairs), of which 92–150 birds occur at this site, where its numbers are probably increasing. The IBA also contains the only nesting cave of *Collocalia elaphra* known on Praslin (60–80 pairs). *Falco araea* was reintroduced on Praslin in 1980, but is now extremely rare (1–3 pairs). *Terpsiphone corvina*, now restricted to La Digue, was still present in the northern edge of the IBA in 1985. Three other Seychelles endemics, *Alectroenas pulcherrima* (300–700 pairs), *Hypsipetes crassirostris* (250–500 pairs) and *Nectarinia dussumieri* (50–100 pairs), are common. Other species of interest include *Streptopelia picturata picturata* while *Phaethon lepturus* and *Gygis alba* breed in very low densities. *Butorides striatus* and *Gallinula chloropus* (both residents) are present along the coast and *Arenaria interpres*, *Numenius arquata* and other visiting waders occur on the beaches all year-round.

Key species

A1	<i>Falco araea</i>	<i>Collocalia elaphra</i>
A2 (100)	Granitic Seychelles EBA: Five of the 11 species of this EBA have been recorded at this site; see Table 2.	

Other threatened/endemic wildlife

Amphibians and reptiles include one species of frog (*Tachycnemis sechellensis*) and six caecilians (e.g. *Grandisonia* spp.), four species of gecko (*Phelsuma* spp. and *Ailuronyx* spp.), two skinks (*Mabuya sechellensis* and *Pamelascincus gardineri*) and two snakes (*Lycognathopsis sechellensis* and *Lamprophis geometricus*), all endemic to Seychelles. Sea-turtles *Eretmochelys imbricata* (CR) nest on the beaches and there is a feeding area for *Chelonia mydas* (EN) along the coast. The majority of the bat *Pteropus sechellensis* population of Praslin roosts in the IBA. Several invertebrates (e.g. molluscs) endemic to Praslin also occur.

Conservation issues

The Vallée de Mai (45 ha) was declared a nature reserve in 1966 to protect the coco-de-mer. It was declared a World Heritage site in 1983 and the Seychelles Island Foundation has been responsible for its management since 1989. Praslin National Park was declared in 1978. Long-term population monitoring and research is conducted on *Coracopsis (nigra) barklyi* and *Collocalia elaphra* by the Ministry of Environment and Transport. The Coco-de-mer palm population is also closely monitored. A project to erect 100 nest-boxes to protect Black Parrot nests from rat predation is currently being implemented. Main threats are fire and introduced fauna (*Tyto alba*, *Rattus* spp.) and flora. The cave hosting the swiftlet colony needs to be adequately protected. A management plan exists, but requires updating.

Further reading

Collar and Stuart (1985), Laboudallon (1997), McDonald (1978), Merritt *et al.* (1986), Rocamora (1997b).

Cousin island

Admin region Praslin

Coordinates 04°20'S 55°40'E

Area c.132 ha Altitude 0–69 m

SC004

A1, A2 (100), A4i, A4ii, A4iii

Special Reserve

Site description

Cousin is a beautiful, small island (27 ha) situated less than 2 km west of Praslin. The site also includes c.105 ha coastal marine habitat. Its large plateau extends over most of the island and is covered with indigenous mature woodland dominated by *Pisonia grandis*, *Morinda citrifolia* and *Ochrosia oppositifolia*. It is almost encircled by a long sandy beach (the shape and width of which changes with each monsoon) with tall *Casuarina equisetifolia* and *Cocos nucifera* trees. The southern coast of the island is, however, rocky. A hill, rising to 69 m, occupies the centre of the southern half of the island. It is dominated by bare rock and boulders, low woodland and *Pandanus balfourii*, *Ficus reflexa*, *F. lutea*, *Euphorbia pyriformis* shrubs, tall herbs and ferns. An area of mangrove and small, temporary freshwater pools are also found. Cousin was formerly a coconut plantation, but most of the trees have now been cut down. Nature conservation, research and ecotourism (day visits, confined to main paths only) are the only human activities (plus some limited fishing by the staff). The reserve funds itself through ecotourism. A marine park, extending 400 m into the sea, hosts pristine coral reefs.

Birds

See Box and Table 2 for key species. This IBA is one of the sites of highest ornithological interest in Seychelles. It used to be the last refuge of *Acrocephalus sechellensis*, with 26–29 individuals surviving in 1959. After conservation efforts and the population's recovery, birds were translocated from here to two other islands. In 1999 the population on Cousin was 353 birds with 104 occupied territories. Cousin is also one of the only four islands hosting *Foudia sechellarum*, with 800–1,200 birds in 1997. A small breeding population of *Copsychus sechellarum* was established in 1995, when three pairs were translocated from Frégate; in 1997 the population had risen to 25 birds with four occupied territories. Two other more common endemics, *Nectarinia dussumieri* (c.250 birds) and *Alectroenas pulcherrima* (a few birds only) are also found, as well as the interbred *Streptopelia picturata picturata* x *rostrata*,

(50–100 individuals, with some showing characteristics of the endemic subspecies). A large colony of seabirds, dominated by *Anous tenuirostris*, is present from May to September. Smaller numbers of *Anous stolidus* (1,300 pairs) also breed during the south-east monsoon. *Gygis alba*, *Phaethon lepturus* and *Sterna anaethetus* (c.600 nests) breed all year-round. During the north-west monsoon, the hill supports an important breeding colony of *Puffinus pacificus* whereas *P. lherminieri* (c.1,000–1,500 pairs) nests all year-round, on the plateau. Several hundreds of both *Fregata ariel* and *F. minor* can be seen soaring or roosting in trees. A few waders are also present year-round, the commonest being *Arenaria interpres* (50–100 birds). *Gallinula chloropus* (10–20 pairs) and *Butorides striatus* (1–2 pairs) also breed on the island.

Key species

A1	<i>Copsychus sechellarum</i>	<i>Foudia sechellarum</i>
	<i>Acrocephalus sechellensis</i>	
A2 (100)	Granitic Seychelles EBA: Three of the 11 species of this EBA have been recorded at this site; see Table 2.	
A4i	Breeding (pairs)	Non-breeding
	<i>Gygis alba</i>	1,860–4,080 (March 1997)
	<i>Anous tenuirostris</i>	71,900–90,000 (1999)
A4ii	<i>Puffinus pacificus</i>	9,250–16,900
	<i>Phaethon lepturus</i>	860–1,540 (July 1999)
A4iii	More than 20,000 waterbirds and 10,000 pairs of seabirds are recorded regularly at this site.	

Other threatened/endemic wildlife

There are three species of skink, *Mabuya wrightii*, *M. sechellensis* and *Pamelascincus gardineri* and two geckos, *Phelsuma astriata*, *Ailuronyx sechellensis*; all endemics. A small population of the rare terrapin *Pelusios subniger* and 12 individuals of the giant tortoise *Dipsochelys dussumieri* are also present. It is also an important nesting site for the turtles *Eretmochelys imbricata* (CR) and, occasionally, *Chelonia mydas* (EN).

Conservation issues

The island was bought in 1968 to save *Acrocephalus sechellensis* and became a wildlife sanctuary managed by the International Council for Bird Preservation (now BirdLife International) and, since January 1998, by BirdLife Seychelles. Cousin was declared a Special Reserve in 1975. The island is rat-free and management activities include the elimination of exotics, habitat restoration and the conservation of native flora and fauna. The only introduced mammal is the hare *Lepus nigricollis*, which is tolerated as it has been shown to have no detrimental effects on vegetation. Monitoring and research on fauna and flora have been conducted over the past 30 years, with long-term study programmes on *Acrocephalus sechellensis* and *Eretmochelys imbricata*. Possible colonization by alien predators, particularly rats, is the main threat. The management plan was updated in 1999.

Further reading

Brooke (1985), Burger and Lawrence (1999a, c), Burger *et al.* (1999), Crook (1960), Diamond (1975a, 1976, 1978), Fosberg (1970a), Komdeur (1997), Komdeur *et al.* (1997), Le Maitre and Brant (1994), Millett *et al.* (1999), Rocamora (1997b), Owen and Bresson (1986), Stoddart (1984).

Cousine island

Admin region Praslin

Coordinates 04°20'S 55°39'E

Area 26 ha Altitude 0–70 m

SC005

 A1, A2 (100), A4i, A4ii, A4iii
 Environmentally Sensitive Area

Site description

Cousine island is situated 5 km south-west of Praslin, 2 km from Cousin. The main part of the island is formed by a ridge of ancient granite rising to 70 m, overlooking a small coastal plateau on the eastern side, fringed by a 1 km long sandy beach. The rest of the island is surrounded by a rugged, rocky coastline. The hill is covered by closed-canopy woodland dominated by *Ficus nautarum*, *F. reflexa* and *Pisonia grandis*. The plateau retains small patches of this woodland, the remainder now being covered with scrub and grassland. The island was formerly exploited for coconuts (*Cocos nucifera*), planted extensively during the twentieth century, and for seabirds (mainly shearwaters). These activities were abandoned in the 1970s and coconuts are being progressively eliminated. A small orchard and garden has been kept for the few

resident staff. The coral reefs around Cousine hold a rich marine life and some traditional fishing takes place. It has a helicopter pad and a small-scale, high class tourist facility.

■ Birds

See Box and Table 2 for key species. This IBA is one of only four major sites in Seychelles with populations of *Copsychus sechellarum*, (13 birds in 1999, from three pairs introduced in 1995), *Acrocephalus sechellensis*, (137 birds and 42 territories in 1997, from 29 birds introduced from Cousin in 1990) and *Foudia sechellarum* (450–670 birds in 1996). In addition, *Nectarinia dussumieri*, *Alectroenas pulcherrima* (tens) and *Streptopelia picturata x rostrata* (c.200 birds) also occur, of which some individuals show the characteristics of *rostrata*. Other landbirds include *Gallinula chloropus* (min. 84 birds), *Butorides striatus* (4–6 birds) and the exotic *Geopelia striata* and *Foudia madagascariensis*. Cousine is also important for breeding seabirds, with the large largest colony of *Puffinus pacificus* in Seychelles. In addition to those listed below, *Puffinus lherminieri nicolae* (hundreds of pairs), *Anous stolidus* (c.900 pairs) and *Sterna anaethetus* (c.50 pairs) also breed. Some 1,300 pairs of *Gygis alba* were present in July 1999 and it is thought that more than 5,000 pairs probably nest during the course of the year. Non-breeding *Fregata ariel* and *F. minor* occur regularly in mixed flocks. *Numenius phaeopus* and *Arenaria interpres* and, less frequently, *Dromas ardeola* can be found throughout the year along the coastline.

Key species			
A1	<i>Copsychus sechellarum</i>	<i>Foudia sechellarum</i>	
	<i>Acrocephalus sechellensis</i>		
A2 (100)	Granitic Seychelles IBA: Three of the 11 species of this IBA have been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Gygis alba</i>	5,000+	—
	<i>Anous tenuirostris</i>	47,800–71,200	—
A4ii	<i>Puffinus pacificus</i>	31,000	—
	<i>Phaethon lepturus</i>	440–850 (July 1999)	—
A4iii	More than 20,000 waterbirds and 10,000 pairs of seabirds are recorded regularly at this site.		

■ Other threatened/endemic wildlife

Two species of skink endemic to Seychelles, *Mabuya wrightii* and *M. sechellensis*, occur at extremely high densities. Other abundant endemics include several species of geckos (*Phelsuma* spp. and *Ailuroonyx* sp.) and invertebrates. A small population of the endemic snake *Lycognathopsis sechellensis* also occurs. Hawksbill turtles *Eretmochelys imbricata* (CR) nest on the beach.

■ Conservation issues

This privately-owned island is currently managed as a wildlife sanctuary and has been placed in a trust by the owner to secure its long-term future. Considerable emphasis is placed on the conservation of native biodiversity, particularly the birds. Numerous monitoring and research projects are being undertaken, including of the coral reefs, marine turtles and terrestrial taxa (birds, reptiles, invertebrates and plants). Removal of all alien plant species and the planting of native trees on the plateau are conservation priorities, as are control measures for *Acridotheres tristis* and *Tyto alba*. Cousine is free of alien mammals (cats were eradicated in 1986). Colonization by rats is a permanent potential threat, as is the poaching of seabirds, particularly *Puffinus pacificus*. A management plan has been prepared.

■ Further reading

Copsey (1997), Copsey and Kraaijeveld (1997), Hitchins (1997), Kraaijeveld (1997), Le Maître (1997), Millett *et al.* (1999), Rocamora (1997b), Wright and Passmore (1999).

La Digue island		SC006
Admin region	La Digue	
Coordinates	04°21'S 55°50'E	A1, A2 (100)
Area	1,010 ha	Altitude 0–333 m
		Special Reserve, Unprotected

■ Site description

Located c.10 km east of Praslin, La Digue is the fourth-largest of the granitic islands. It is surrounded by beautiful sandy beaches, rocky

coasts and a fringing coral reef. Traditional activities, including copra-production and fishing, were the basis of the economy until the tourism industry began in the 1970s. The western plateau (161 ha) was originally entirely covered with marshland and an extensive native forest of *Calophyllum inophyllum* and *Terminalia catappa*. Today, only 25% of its area retains indigenous woodland. Significant drainage has taken place, but an important wetland of reedbeds, small ponds and mangroves, Lanmar Soupap, remains. The rest of the plateau is now occupied by housing and tourism developments, coconut plantation and farmland. Little development has taken place on the hill, Nid d'Aigles, in the east of the island. Much drier than the plateau, it supports mixed woodland with both exotic and indigenous trees, small streams, large granite boulders and caves. The site includes La Veuve Special Nature Reserve.

■ Birds

See Box and Table 2 for key species. La Digue is the only island where *Terpsiphone corvina* is known to breed, all other populations historically present in other islands of the Praslin group having progressively disappeared (although a few birds have been reported on Marianne since 1997). Fifty-four of the 69 confirmed territorial pairs are concentrated on the western plateau, with the total population estimated to be 150–200 birds. There is a cave at 250 m on the hill with two small colonies of *Collocalia elaphra* (35–45 pairs). Important populations of *Alectroenas pulcherrima* (400–600 pairs), *Hypsipetes crassirostris* (2,000–4000 pairs) and *Nectarinia dussumieri* (1,500–3,000 pairs) also occur. Several hundreds of pairs of *Streptopelia picturata picturata* are also present, as well as small numbers of *Phaethon lepturus* and *Gygis alba*. The wetland regularly hosts several species of migrant and resident waterbirds, including 10–20 pairs of the rare *Ixobrychus sinensis*.

Key species		
A1	<i>Collocalia elaphra</i>	<i>Terpsiphone corvina</i>
A2 (100)	Granitic Seychelles IBA: Five of the 11 species of this IBA have been recorded at this site; see Table 2.	

■ Other threatened/endemic wildlife

Amphibians include one species of frog (*Tachycnemis sechellensis*) and three caecilians, all endemic to Seychelles. The western plateau marshes are a stronghold for the rare terrapins *Pelusios castanoides* and *P. subniger*. The Seychelles sheath-tailed bat *Coleura sechellensis silhouettae* (CR) is present on La Digue and large numbers of the bat *Pteropus sechellensis* also occur.

■ Conservation issues

The small Special Reserve of La Veuve has been extended by 10 ha through a land acquisition programme conducted by the Ministry of Environment and Transport and financed by various sponsors, including the Dutch Trust Fund, the Environment Trust Fund, and private donors. A second phase to include the last remnants of native plateau forest is urgently needed. The main threats include continuing deforestation of the plateau for housing and tourism developments and illegal felling and ring-barking of trees. Invasion of the marsh by water lettuce (*Pistia*) and water hyacinth (*Eichhornia*) is also of concern, as is increased disturbance of the swiftlet colony by unauthorized visits.

■ Further reading

Bullock *et al.* (1988), Neufelt (1992), Rocamora (1997b), Skerrett and Bullock (1992), Watson (1981b, 1991).

Silhouette island		SC007
Admin region	—	
Coordinates	04°29'S 55°14'E	A1, A2 (100)
Area	1,995 ha	Altitude 0–740 m
		Unprotected

■ Site description

Located c.20 km north of Mahé, Silhouette is the third-largest and second-highest island of the granitic group. There is a great diversity of habitat on the island, from coastal reef-flats to mist-forest. There are two main plateaus, limited in size, each supporting coconut plantations and other man-made habitats, as well as relatively large

wetlands and indigenous woodland. The rest of the island consists of densely vegetated steep slopes, impressive glacis and sheer cliffs which fall to the sea. Although exotic plants (e.g. *Psidium cattleianum*, *Cinnamomum verum* and *Syzygium jambos*) are present, they are less widespread than on the other large islands, and some areas still retain original forest-types from sea-level (*Callophyllum inophyllum* woodland) to high altitude (*Pisonia sechellarum* forest, unique to Silhouette). Only 11% of the 195 species of angiosperm recorded on Silhouette are introduced, while 34% are Seychelles endemics (including the trees *Carissa sechellensis* and *Mimusops sechellarum*), with 2% endemic to Silhouette (e.g. *Achyrospermum sechellarum*, *Schefflera procubens* and *Amaracarpus pubescens*). Silhouette has a human population of 135 (June 1999) with the majority living at La Passe; two families (six people) live at Grand Barbe and one couple at Anse Mondon. Human land-use covers only c.8% of the island, its steep gradients limiting major development. The main activities include the production of copra and cinnamon bark, fishing and tourism—there is a small hotel, served by helicopter from Mahé.

■ Birds

See Box and Table 2 for key species. The IBA contains 10–20 pairs of *Falco araea*. Silhouette is also of importance for *Alectroenas pulcherrima* (100–500 pairs), *Hypsipetes crassirostris* (500–2,700 pairs) and *Nectarinia dussumieri* (1,200–3,700 pairs). Other species include *Streptopelia picturata picturata*, possibly introduced, and *Phaethon lepturus*, which nests in trees. Three resident breeding waterbird species, *Bulbulcus ibis*, *Butorides striatus* and *Gallinula chloropus* are common in wetlands of the plateaus.

Key species

A1	<i>Falco araea</i>
A2 (100)	Granitic Seychelles IBA: Four of the 11 species of this IBA have been recorded at this site; see Table 2.

■ Other threatened/endemic wildlife

Due to its wide range of habitats, Silhouette supports an exceptional diversity of indigenous fauna, which includes several species of insects (e.g. an endemic stick insect *Carausius scotti*) and other invertebrates endemic to Silhouette or becoming rare on other islands. Amphibians comprise four species of frog and six caecilian species, while reptiles include *Lamprophis geometricus*, *Lycognathophis sechellensis*, *Chamaeleo tigris*, *Mabuya sechellensis*, four burrowing skinks (*Pamelaescincus gardineri* and *Janetaescincus braueri*) and four species of gecko, all endemic to Seychelles. The bat *Coleura sechellensis silhouettae* (CR) is present; the only roosting cave for the species currently known occurs on the island. The fruit bat *Pteropus sechellensis* is present in large numbers.

■ Conservation issues

The spread of exotic plants, particularly by the highly invasive *Clidemia hirta*, is a significant threat. A conservation project for the island exists (a joint NPTS / IDC / MET programme). NPTS has published a full species list for Silhouette. Captive-breeding projects for Seychelles giant tortoises *Dipsosaurus* spp. and Seychelles terrapins *Pelusios* spp. are managed by NPTS at La Passe. This IBA is also a potential site for the translocation of *Terpsiphone corvina*, presently restricted to La Digue (SC006) (with a few on Marianne). A Marine National Park of 2,000 ha surrounds the IBA.

■ Further reading

Carlström (1996a, b), Cresswell *et al.* (1997), Gerlach (1993, 1997), Greig-Smith (1986), NPTS (1996), OUSE (1990), Rocamora *et al.* (1996).

Frégate island

Admin region —

Coordinates 04°35'S 55°56'E

Area 219 ha Altitude 0–125 m

SC008

A1, A2 (100), A4i

Unprotected

■ Site description

Frégate is the easternmost of the granitic islands. It comprises two hills reaching a maximum of 125 m and two low-lying coastal plateaus covering 26 ha. The original vegetation was almost totally cleared in the nineteenth century and replaced by agricultural plantation crops.

These were abandoned and reverted to the wild after agriculture became uneconomic and now form the dominant component of the vegetation, a mixed shrub-woodland of *Cocos nucifera*, *Cinnamomum verum*, *Anacardium occidentale* and assorted fruit trees. Patches of mature forest dominated by *Pterocarpus indicus* and native *Callophyllum inophyllum* also occur. Rocky areas with glacis and boulders, rocky coasts with cliffs and several pristine sandy beaches contribute to the beauty of the landscape. A small, artificial marsh, created to replace one that existed before the harbour was built, is the only wetland. Frégate is privately owned and has a small, exclusive hotel served by plane from Mahé. Besides tourism, the other main activity is agriculture, both of which cover less than 15% of the island.

■ Birds

See Box and Table 2 for key species. Frégate is currently the major stronghold of *Copsychus sechellarum* and was the island on which the species survived and from where birds were later translocated to other islands. In 1999, 51 birds were present and there were 14 occupied territories. The IBA also holds one of only four populations of *Foudia sechellensis*, with possibly 1,000–3,000 birds. There are also high densities of *Alectroenas pulcherrima* (>50 pairs) and *Nectarinia dussumieri* (>100 pairs). Frégate also historically held large seabird colonies, but these have mostly become extinct. *Anous tenuirostris* and *Gygis alba* remain the most numerous, with small numbers of *Phaethon lepturus* (c.20 pairs) and *Sterna fuscata* (c.1,000 pairs). *Sterna anaethetus* and *Anous stolidus* breed in limited numbers on a small satellite island, L'îlot Frégate, off the south-east point of Frégate (not included in the IBA, but under the same ownership). A variety of vagrants occur on the island; *Arenaria interpres* (100–200 birds) is the most abundant non-breeding visitor and is found all year-round.

Key species

A1	<i>Alectroenas pulcherrima</i>	<i>Nectarinia dussumieri</i>
	<i>Copsychus sechellarum</i>	<i>Foudia sechellarum</i>
A2 (100)	Granitic Seychelles IBA: Four of the 11 species of this IBA have been recorded at this site; see Table 2.	
A4i	Breeding (pairs)	Non-breeding
	<i>Anous tenuirostris</i>	—
	<i>Gygis alba</i>	—

■ Other threatened/endemic wildlife

Frégate is one of only four islands where the skink *Mabuya wrightii* can be found, and also supports high densities of the endemic gecko *Ailuronyx sechellensis*, and the snakes *Lycognathophis sechellensis* and *Lamprophis geometricus*. There is a population of the terrapin *Pelusios subniger* and an introduced one of Aldabra giant tortoises *Dipsosaurus dussumieri*. Hawksbill turtles *Eretmochelys imbricata* (CR) nest on the beaches. Until the early 1990s, Frégate used to support what was possibly the highest density of caecilians in the world. Numbers of the two species concerned, *Grandisonia alternans* and *Hypogeophis rostratus*, have declined drastically since then. It is thought that the introduction of pigs has contributed to this. The giant tenebrionid beetle *Pulposipes herculeanus* (CR) and the snail *Pachnodus fragatensis* are found only on Frégate.

■ Conservation issues

BirdLife International and RSPB have been implementing a recovery programme for *Copsychus sechellarum* on Frégate since 1990, in collaboration with government and the owner of the island. Main threats to the native fauna are the arrival of *Rattus norvegicus* in 1995, and also the possible colonization by *Rattus rattus* (one killed on the pier in 1997), following the recent construction of a harbour. An attempt to eradicate rats in 1996 failed, but a more intensive campaign in 2000 was successful. Strict precautionary measures will be required to prevent further colonizations. Restoration of native mature woodland is crucial for the survival of *Copsychus sechellarum*, as is control of the use of domestic and agricultural insecticides, by which the species can easily be poisoned. An island management plan is being prepared by Frégate Island Resort. Severe poaching of eggs, chicks and adults on neighbouring L'Îlot Frégate is preventing this unprotected islet from recovering to become the important seabird colony it was; more than 25,000 *Anous stolidus* and *Sterna fuscata* bred in 1955.

Further reading

Burger and Lawrence (1999b), Gretton (1992), Komdeur (1996), McCulloch (1994, 1996), Millett *et al.* (1999), Parr (1997), Ridley and Percy (1966), Robertson and Todd (1983), Thorsen and Shorten (1997), Watson *et al.* (1992).

Montagne Glacis

Admin region Mahé

Coordinates 04°34'S 55°27'E

Area c.20 ha Altitude 250–458 m

SC009

A1, A2 (100)

Unprotected

Site description

This IBA is situated on slopes of the highest mountain of the northern cape of Mahé. A short, dense shrub woodland vegetation is dominated by introduced species, mainly *Tabebuia pallida*, *Cinnamomum verum* and *Chrysobalanus icaco*. Scattered taller trees include *Paraserianthes falcata*, *Sandoricum indicum* and *Pterocarpus indicus*, while some endemic species such as *Deckenia nobilis*, *Phoenicophorium borsigianum* and *Paragenipa wrightii* are also found. There are some rocky areas with large boulders and caves. The woodland was exploited for the cinnamon industry, firewood and timber until 20–30 years ago. Only some selective cutting now occurs.

Birds

See Box and Table 2 for key species. The site holds the largest colony of *Collocalia elaphra* known in Seychelles, comprising 600–800 pairs (March 1997 estimate). The colony is located on the roof of a large cave of difficult access, at c.10 m from the ground, and consists of a single mass of nests between 6–8 m in length. A few pairs of *Falco araea* are also present, as well as the three more common endemics *Alectroenas pulcherrima*, *Hypsipetes crassirostris* and *Nectarinia dussumieri*. *Streptopelia picturata picturata* also occurs, as well as *Phaethon lepturus* and *Gygis alba* which nest at low densities in trees and rocks.

Key species

A1	<i>Falco araea</i>	<i>Collocalia elaphra</i>
A2 (100)	Granitic Seychelles EBA: Five of the 11 species of this EBA have been recorded at this site; see Table 2.	

Other threatened/endemic wildlife

Small numbers of endemic reptiles and amphibians are present.

Conservation issues

Regular monitoring of the *Collocalia elaphra* colony is conducted by the Ministry of Environment and Transport. Introduced predators (such as *Rattus* spp. and *Tyto alba*) have been implicated as predators of swiftlet colonies elsewhere. These may here predate *Collocalia elaphra* and could be a threat. However, the colony's size and location, high and deep in the cave, appears to provide good protection, including from human disturbance. Urbanization in the La Gogue area and fire are also potential threats.

Further reading

Joubert and Rémie (1992), Rocamora (1997b).

Mahé highlands and surrounding areas

Admin region Mahé

Coordinates 04°38'S 55°25'E

Area c.4,600 ha Altitude 0–914 m National Park, Unprotected

SC010

A1, A2 (100)

National Park, Unprotected

Site description

This site occupies the north-western and central part of Mahé (c.20% of the whole island) and contains Morne Seychellois National Park (3,090 ha), which includes the highest mountain of Seychelles (914 m). Its steep slopes are covered with dense secondary forests and shrub woodland, interrupted by impressive cliffs and granite boulders (*glacis*). This IBA also includes the mountainous area to the south-east, between the former Satellite Tracking Station (New Savy), Cascade, Montagne Planeau, Grand Bois, Castor, Varigault and Mont Sébert. This area lies outside the national park, but a project exists to partially protect it. The adjacent areas of La Misère and Cascade, also included, are mainly occupied by man-modified habitats, such as

residential areas, orchards, small-scale agriculture and cattle farms, tea plantations, roads, powerlines and other infrastructure. Forests of low and intermediate altitudes are dominated by exotic, invasive trees (mainly *Cinnamomum verum*, *Paraserianthes falcata* and *Alstonia macrophylla*), shrubs (the invasive exotic *Chrysobalanus icaco*), and huge granite boulders but, above 600 m in the Morne Seychellois National Park, stands of primary moist forest with few exotics still remain. Endemic species include *Medusagyne oppositifolia* and *Vateriopsis sechellarum* (both very rare), *Dillenia ferruginea* and *Northea hornei* (more common), *Phoenicophorium borsigianum* and *Nephrosperma vanhoutteanum*, *Erythroxylum sechellarum*, *Nepenthes pervillei* and *Secamone schimperianus*. During the nineteenth and the first half of the twentieth centuries extensive exploitation of timber and cinnamon production took place. Present human activities (forestry, nature conservation/research, tourism and a little tea cultivation), are limited to less than 10 % of the total area of the IBA.

Birds

See Box and Table 2 for key species. This site contains virtually the world population of *Otus insularis* (90–180 pairs). The La Misère, Haut Barbarons, and Cascade areas are the only three known significant breeding sites on Mahé for *Zosterops modestus* (c.12 pairs plus helpers, with about 10–15 birds at each site). These hold about 10% of the world population for this species. The IBA also holds 60–120 pairs of *Falco araea* (about 25% of the world population) and *Collocalia elaphra*, of which there are probably several hundreds of pairs, nesting in as yet undiscovered colonies. One cave near Le Niol, apparently occupied in the past, is now deserted. Due to its large size, the site is also of great importance for *Alectroenas pulcherrima* (>350 pairs), *Hypsipetes crassirostris* (1,700–2,400 pairs) and *Nectarinia dussumieri* (1,500–2,300 pairs). Other species of interest include *Streptopelia picturata picturata*, *Phaethon lepturus* (at least 200 pairs) and *Gygis alba*. *Butorides striatus* and *Gallinula chloropus* occur in ponds at low altitude.

Key species

A1	<i>Falco araea</i>	<i>Collocalia elaphra</i>
	<i>Otus insularis</i>	<i>Zosterops modestus</i>
A2 (100)	Granitic Seychelles EBA: Seven of the 11 species of this EBA have been recorded at this site; see Table 2.	

Other threatened/endemic wildlife

Four species of frogs and six species of caecilians endemic to Seychelles occur. The IBA is the main stronghold for the rare endemic tiger chameleon *Chamaeleo tigris* and contains important populations of the endemic snakes *Lamprophis geometricus* and *Lycognathophis sechellensis*. Several endemic skinks and geckos are also present. The site also hosts small numbers of the bat *Coleura sechellensis sechellensis* (CR) and large numbers of the bat *Pteropus sechellensis*.

Conservation issues

Revision of boundaries of the present National Park may result in the inclusion of the mountainous areas to the south, in the Central Highlands. A buffer zone may also be added to the existing park. Current research and monitoring activities in the park are limited due to difficulties of access. A management plan has recently been produced for the park. Main threats include exotic plants replacing native flora and infringement of the park boundaries by housing development. Predation by introduced rats, domestic cats and birds (e.g. *Tyto alba*) of the native bird fauna appears to be a serious problem. In particular, nest-predation by rats *Rattus rattus* and mynah-birds *Acridotheres tristis* is considered a major threat to the survival of the *Zosterops modestus* population and, possibly, of *Otus insularis*. Planned housing and road development projects in Mahé Central Highlands may pose a significant threat, if confirmed. Illegal cutting of threatened endemic plants for food (*Deckenia nobilis*) and traditional medicinal use may also become a problem. Conservation measures are needed for *Zosterops modestus* in the residential La Misère and Cascade areas. These include control of insecticide use, public awareness, limitation of housing development and tree-felling and close monitoring of habitat and of the *Zosterops* population.

Further reading

Beaver and Chong-Seng (1990–1992), Fanchette *et al.* (2000), Fourmy (1999), Loustau-Lalanne (1962), Mee (1996), Mellamby *et al.* (1997), Rocamora (1997a, b), Skerrett and Bullock (1992), Watson (1981a).

Conception island

Admin region Mahé

Coordinates 04°39'S 55°22'E

Area 60 ha Altitude 0–135 m

SC011

A1, A2 (100)

Unprotected

Site description

Conception is a small island located less than 2 km west of the north-western coast of Mahé. Surrounded by a rocky coastline with cliffs, its steep slopes are entirely covered by dense woodland and thickets, growing over large boulders and crevasses. Until the mid-1970s it was exploited as a coconut plantation, but has since remained abandoned and uninhabited. There is no beach on which to land, no permanent surface fresh water and no paths, making it very inhospitable. Vegetation is dominated by the introduced species *Cinnamomum verum*, *Anacardium occidentale*, *Cocos nucifera* and *Tabebuia pallida*, but the endemics *Phoenicophorium borsigianum* and *Allophylus sechellensis* and the indigenous *Canthium bibracteatum* and *Premna obtusifolia* are well-represented in the undergrowth.

Birds

See Box and Table 2 for key species. Conception is the main stronghold for *Zosterops modestus*. This population was only discovered in January 1997. It was estimated in 1999 to be 242–327 birds or 60–80 breeding families (including helpers), about 85 % of the current total population estimate. There are also several pairs of *Falco araea* on the island, as well as a minimum of 100 pairs of *Alectroenas pulcherrima*. *Streptopelia picturata picturata* and three exotic species are also present in small numbers.

Key species

A1	<i>Falco araea</i>	<i>Zosterops modestus</i>
A2 (100)	Granitic Seychelles EBA: Three of the 11 species of this EBA have been recorded at this site; see Table 2.	

Other threatened/endemic wildlife

Not well known. *Mabuya sechellensis* and *Phelsuma astriata* are abundant. *Phelsuma longinsulae* and *Ailuroyx sechellensis* have also been recorded. Marine life around the island appears very rich and includes the hawksbill turtle *Eretmochelys imbricata* (CR).

Conservation issues

Conception is in the process of being declared a Special Reserve by government. Fire appears to be the main threat, as it could easily destroy all the vegetation and the *Zosterops modestus* population. The biology and ecology of this species on Conception are currently being investigated and compared with results from Mahé. A management plan for the island is required. *Rattus norvegicus* is abundant on the island which is, however, not arboreal, unlike *Rattus rattus*, which is present on all other satellite islands of Mahé and a significant nest-predator. This may be the main reason why *Zosterops modestus* is abundant on Conception, rare on Mahé and absent from the other islands. Indian Mynah *Acridotheres tristis*, a potential nest-predator, is also present, but not in large numbers.

Further reading

Cheke (1984), Rocamora (1997a, b), Rocamora and François (2000).

African Banks

Admin region —

Coordinates 04°54'S 53°20'E

Area 750 ha Altitude 0–4 m

SC012

A4i, A4iii

Area of Restricted Access

Site description

The site is the northernmost island of the Amirantes group and lies c.220 km west of Mahé; it includes 720 ha of coastal marine habitat. It formerly comprised two islands but, by 1976, South Island had eroded, leaving a small sandstone ridge exposed only at low tide. The remaining land area, North Island, is a small, flat sandstone island (30 ha), with no human settlement. There is a derelict automatic lighthouse. It is frequently visited by poachers and there is considerable exploitation and disturbance of nesting birds. Tourists occasionally

visit by charter yachts. The island is almost treeless (one coconut tree in 1995), being otherwise covered in grass and low-growing vegetation.

Birds

See Box for key species. The colony of *Sterna fuscata* was once much larger; in 1955 it was estimated at 40,300 pairs and in 1974 at 20,300 pairs. The site holds one of only three colonies of *Sterna dougallii* in Seychelles, with 82 pairs. Other species include *Sterna bergii* (six pairs in 1974, possibly no longer breeds).

Key species

A4i		Breeding (pairs)	Non-breeding
	<i>Sterna sumatrana</i>	c.10	—
	<i>Sterna fuscata</i>	5,000–10,000	—
	<i>Anous stolidus</i>	2,000–5,900	—
A4iii	More than 20,000 waterbirds have been recorded at this site.		

Other threatened/endemic wildlife

The turtles *Chelonia mydas* (EN) and *Eretmochelys imbricata* (CR) nest and may be taken by poachers.

Conservation issues

The island is protected under the Wild Birds Protection (Nature Reserve) Regulations 1966. However, enforcement of the law is extremely difficult as the island has no human presence to report the activities of poachers. The site could potentially support more than 20,000 pairs of *Sterna fuscata* were it not for poaching. Eggs of *Anous stolidus* are probably also taken. *Sterna bergii*, *S. dougallii* and *S. sumatrana* may also suffer from poaching, or at least from disturbance.

Further reading

Feare (1979b), Fosberg and Renvoize (1970), Ridley and Percy (1958), Skerrett (1995), Stoddart and Poore (1970).

D'Arros island

Admin region —

Coordinates 05°25'S 53°18'E

Area 150 ha Altitude 0–1 m

SC013

A1, A2 (100)

Unprotected

Site description

The site is an oval-shaped, flat, low-lying coral island situated c.250 km west-south-west of Mahé in the Amirantes group. The vegetation is dominated by coconut-palms and *Casuarina equisetifolia*. It is privately owned, with one large house for use of guests, who rent the island, and a collection of smaller, permanently occupied houses for the island's staff. A small area of the island is cultivated. The island is bisected by an airstrip. There are no regular flights but, occasionally, scheduled flights to nearby Desroches divert to D'Arros.

Birds

See Box and Table 2 for key species. Five *Foudia sechellarum* from Cousin were introduced in 1965 by an expedition from Bristol University, UK. The birds have become established and now c.100 pairs occur alongside introduced *Foudia madagascariensis*, *Passer domesticus* and *Geopelia striata*, as well as rats and feral cats. One other landbird occurs, *Streptopelia picturata* (origin unknown).

Key species

A1	<i>Foudia sechellarum</i>
A2 (100)	Granitic Seychelles EBA: One of the 11 species of this EBA occurs at this site; see Table 2.

Other threatened/endemic wildlife

The turtles *Chelonia mydas* (EN) and *Eretmochelys imbricata* (CR) nest and may be taken by poachers, though the current management is sympathetic to their conservation.

Conservation issues

No conservation measures have been taken. Eradication of introduced cats and rats would increase the potential of the island for birds.

Further reading

Skerrett (1995).

Etoile island

Admin region —

Coordinates 05°53'S 53°19'E

Area 1.4 ha Altitude 0–1 m

SC014

A4i

Bird Reserve

Site description

The site is a small, circular coral cay in the Amirantes group, situated c.300 km south-west of Mahé. There are no trees; the vegetation comprises mainly grass and low bushes surrounded by a steep sandy beach. It is fairly easy to land in calm conditions. There is no resident human population.

Birds

See Box for key species. The site is one of only three known breeding sites in Seychelles for *Sterna dougallii*. In addition, *Sterna fuscata* (c.5,000 pairs) and *Anous stolidus* (800–1,200 pairs) breed. All three species breed in dense colonies during the south-east monsoon.

Key species

A4i	Breeding (pairs)	Non-breeding
<i>Sterna dougallii</i>	100–200	—

Other threatened/endemic wildlife

The turtles *Chelonia mydas* (EN) and *Eretmochelys imbricata* (CR) nest and may be taken by poachers.

Conservation issues

The island is protected under the Wild Birds Protection (Nature Reserve) Regulations 1966. However, enforcement of the law is extremely difficult as the island has no human presence to report the activities of poachers.

Further reading

Skerrett (1995), Stoddart (1984).

Boudeuse island

Admin region —

Coordinates 06°05'S 52°53'E

Area 1.4 ha Altitude 0–3 m

SC015

A4ii

Bird Reserve

Site description

The site lies c.320 km south-west of Mahé on the western edge of the Amirantes group. It is a small, sandstone platform island, with no resident human population. There is a small sandy beach, but it is difficult to land due to heavy swells even during calm weather. There are no trees. The island may be one of the most pristine cays in the western Indian Ocean, with no introduced vegetation.

Birds

See Box for key species. This is one of the last two strongholds of *Sula dactylatra* in Seychelles. In addition, c.500 pairs of *Puffinus pacificus* breed.

Key species

A4ii	Breeding (pairs)	Non-breeding
<i>Sula dactylatra</i>	3,000–5,000	—

Other threatened/endemic wildlife

The turtles *Chelonia mydas* (EN) and *Eretmochelys imbricata* (CR) nest and may be taken by poachers.

Conservation issues

The island is protected under the Wild Birds Protection (Nature Reserve) Regulations 1966. However, enforcement of the law is extremely difficult as the island has no human presence to report the activities of poachers. In 1976 a large number of *Sula dactylatra* were killed and many rings recovered. Rats are not present on the island.

Further reading

Feare (1978b), Skerrett (1995), Stoddart (1984).

Marie-Louise island

Admin region —

Coordinates 06°10'S 53°08'E

Area 52.5 ha Altitude 0–1 m

SC016

A4i, A4iii

Unprotected

Site description

The site lies c.300 km south-west of Mahé in the Amirantes group. It is a low-lying coral island dominated by coconut-palms and *Casuarina equisetifolia*. There is a resident human population engaged in agriculture and fishing. The island is bisected by an airstrip, but there are no regular, scheduled flights. The site is used as a support base for the collection of *Sterna fuscata* eggs on the neighbouring island of Desnoeuvs to the south-west, where there is no resident population outside the nesting season.

Birds

See Box for key species. Marie Louise differs from all other populated coral islands of the Amirantes group in that it retains large numbers of breeding seabirds. This is presumed to be due to the absence of rats. It is the only outer island with large numbers of breeding *Anous tenuirostris*. It also hosts the largest population of *Gygis alba* in the outer islands. There are no indigenous landbirds and just one introduced species, *Passer domesticus*.

Key species

A4i	Breeding (pairs)	Non-breeding
<i>Gygis alba</i>	2,000–4,000	—
<i>Anous stolidus</i>	1,000–3,000	—
<i>Anous tenuirostris</i>	2,000–5,000	—
A4iii	More than 20,000 waterbirds have been recorded at this site.	

Other threatened/endemic wildlife

The turtles *Chelonia mydas* (EN) and *Eretmochelys imbricata* (CR) nest and may be taken by poachers.

Conservation issues

No conservation measures have been taken. Eggs of *Anous stolidus* may be taken. The smaller eggs of *Anous tenuirostris* and *Gygis alba* are less likely to be exploited. Rats are absent, but mice occur.

Further reading

Skerrett (1995).

Desnoeuvs island

Admin region —

Coordinates 06°14'S 53°32'E

Area 35 ha Altitude 0–4 m

SC017

A4i, A4iii

Unprotected

Site description

The site lies at the southern end of the Amirantes chain, c.300 km south-west of Mahé. It is a more-or-less circular island with a high rim surrounding a central depression. Most of the land is exposed sandstone, guano having been removed during the last century. The island is a base for the commercial exploitation of seabirds, especially the eggs of *Sterna fuscata*. There is no permanent human population, but buildings have been constructed and are used during the nesting season (June–August). Visits are made at other times by residents of nearby Marie-Louise island and by fishermen. The island is almost treeless, being covered in grasses and other low-growing plants. Landing can be extremely difficult, with heavy swells sweeping round the island even during the calmest sea conditions.

Birds

See Box for key species. The island may once have had the largest colony of *Sterna fuscata* in Seychelles. There are old estimates that this colony used to number more than one million pairs, possibly indicating a substantial decline. The island also supports large but unknown numbers of *Puffinus pacificus* and *Anous stolidus*, which may prove to exceed threshold levels. There used to be large colonies of *Sula leucogaster* (extinct by 1995) and *Sula dactylatra* (now only a few pairs) and, at least until the 1970s, a small population of *Puffinus lherminieri*. Other species include *Bubulcus ibis* (53–62 pairs) and a few pairs of *Gygis alba*.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Sterna fuscata</i>	360,000–500,000	—
A4iii	More than 20,000 waterbirds are recorded regularly at this site.	

Other threatened/endemic wildlife

The turtles *Chelonia mydas* (EN) and *Eretmochelys imbricata* (CR) nest and may be taken by poachers.

Conservation issues

Representatives from the Ministry of Environment and Transport oversee egg-collection during the season (June–August). An area of the colony has been set aside in the past for protection, though its boundaries have sometimes been switched with the exploited area and it has no legal status. Outside the *Sterna fuscata* nesting season, poachers may visit and take large numbers of *Puffinus pacificus*, which breed from September to January. Exploitation has probably led to the extinction of *Sula leucogaster* and the near-extinction of *Sula dactylatra*. There is some uncertainty about the future of egg exploitation. Rats are absent, but mice occur.

Further reading

Feare (1976a, 1976b, 1978a, 1984a, 1984b), Feare and Gill (1996), Feare *et al.* (1997), Rémie and Nolin (1999), Ridley and Percy (1958).

Islets of Farquhar atoll		SC018
Admin region —		
Coordinates 10°11'S 51°07'E		
Area c.17,825 ha Altitude 0–2 m		
		A4i, A4iii Unprotected

Site description

The site comprises the smaller, uninhabited islands of Farquhar atoll, which lies 770 km south-south-west of Mahé and c.200 km north-north-east of Madagascar. Farquhar is a low-lying flat, roughly circular atoll of 10 islands (totalling c.25 ha of land) surrounding a shallow lagoon (17,800 ha) which dries extensively at low tide. Excluded from the IBA are the two largest islands, Ile du Nord and Ile du Sud, together with three smaller intervening islands known as the Manahas. There is a permanent human settlement and an airstrip on Ile du Nord. There are plans to build an hotel here, to be served by regular flights from Mahé. The islands are dominated by coconut trees and some *Casuarina equisetifolia*. Historically, much of the atoll was under plantation but today only a small amount of copra is produced. Some exploitation of seabird eggs takes place. The island with the greatest ornithological interest is Goelettes, the most southerly point of land in Seychelles. In contrast to the other islands, Goelettes is almost treeless; it is covered in grasses, other short vegetation and a few *Scaevola taccada* bushes.

Birds

See Box for key species. There is a large colony of *Sterna fuscata* on Goelettes during the south-east monsoon (May–October). *Sterna sumatrana* also breeds on Goelettes and, possibly, on other islets. Other breeding species include *Sula sula* (50–70 pairs), *Butorides striatus*, *Bubulcus ibis* (100–150 pairs), *Ardea cinerea*, *Anous stolidus* and *Gygis alba*. *Sula leucogaster* bred on Ile Lapin (4 pairs in 1976) but there are no recent data. There are roosts of non-breeding *Fregata minor* and *F. ariel*. No indigenous landbirds now survive, though an unidentified species of blue pigeon, now extinct, occurred at the time of man's first arrival. Two introduced landbirds occur, *Geopelia striata* and *Foudia madagascariensis*. The lagoon supports migratory waders which may sometimes include large numbers of *Dromas ardeola* and *Arenaria interpres* but data are lacking.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Sterna sumatrana</i>	10–30	—
<i>Sterna fuscata</i>	200,000–400,000	—
A4iii	More than 20,000 waterbirds are recorded regularly at this site.	

Other threatened/endemic wildlife

Green turtles *Chelonia mydas* (EN) nest and are sometimes poached.

Conservation issues

No conservation measures have been taken. Uncontrolled collection of eggs is a threat to the *Sterna fuscata* colony. At present, this may be restricted by the absence of regular sea or air links to the main population centres in the granitic islands. The threat may increase when a regular air link to Mahé is established, following new human developments. Poaching may have reduced or exterminated *Sula leucogaster*. Rats are present on the larger islands and restrict the range of ground-nesting *Sterna fuscata* and *S. sumatrana*.

Further reading

Feare (2000), Fosberg and Renvoize (1970b), Skerrett (1996b), Stoddart and Poore (1970).

Cosmoledo atoll		SC019
Admin region —		
Coordinates 09°42'S 47°34'E		
Area c.14,960 ha Altitude 0–8 m		
		A4i, A4ii, A4iii Unprotected

Site description

Cosmoledo is a raised coralline atoll in the Aldabra group, lying c.120 km east-south-east of Aldabra atoll, 700 km east of Africa and 400 km north-west of Madagascar. It comprises 13 islands and a few tiny islets (460 ha) surrounding a roughly circular lagoon (c.14,500 ha). The lagoon dries out extensively at low tide. Much of the interior of the atoll is characterized by irregular limestone formations known as 'champignon'. The vegetation is similar to Aldabra (SC020), dominated by salt-resistant *Pemphis acidula*, but there are some extensive open grassy areas suitable for three species of ground-nesting seabirds not present on Aldabra (*Sula dactylatra*, *S. leucogaster* and *Sterna fuscata*). The islands of Menai and Grand Ile used to have resident human populations engaged in agriculture, fishing and the exploitation of seabirds, seabird eggs and turtles. However, the atoll has now been abandoned. It is visited by boats from both within Seychelles and from Comoros for the illegal poaching of seabirds, eggs and turtles. Two of the three largest islands (Grand Ile and Ile Sud Ouest) do not appear to have rats and, probably, most or even all islets are rat-free.

Birds

See Box for key species. The site holds Seychelles' largest colonies of *Sula sula* and *S. dactylatra*, both of which have suffered drastic reductions in numbers elsewhere in the Indian Ocean, including extinction on some islands. Cosmoledo is now the only site in Seychelles with a viable population (c.60 pairs) of *S. leucogaster*, nesting mainly on Ile du Sud Ouest, with a few on Ile du Nord. Exploitation has greatly reduced numbers of breeding *Fregata minor* to 10–20 pairs, down from hundreds of pairs in the 1970s. *Fregata ariel* also once bred, but now may be extinct. Nevertheless, 200–400 non-breeding *Fregata minor* regularly occur, as do similar numbers of *Fregata ariel*. The site is the only breeding area in the Aldabra group for *Sterna fuscata*. It is the largest colony in Seychelles and, perhaps, in the western Indian Ocean. Some 15–30 pairs of *Egretta dimorpha* also breed. Resident landbirds include three endemic Seychelles races, *Zosterops maderaspatana menaiensis* (restricted to Cosmoledo and Astove), *Nectarinia sovimanga buchenorum* (restricted to Cosmoledo and Astove) and a form of *Streptopelia picturata*. This has been assumed to be *coppingeri*, but its status is currently under investigation and may prove to be a race restricted to Cosmoledo. *Cisticola cherina*, believed to be a relatively recent natural colonizer, is common on most islands; it occurs in Seychelles only on Cosmoledo and Astove.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Sterna bergii</i>	100–500	—
<i>Sterna sumatrana</i>	50–100	—
<i>Sterna fuscata</i>	1,100,000	—
<i>Dromas ardeola</i>	—	2,000
<i>Arenaria interpres</i>	—	400
A4ii		
<i>Phaethon rubricauda</i>	50–200	—
<i>Sula dactylatra</i>	5,000–6,000	—
<i>Sula sula</i>	15,000+	—

Key species ... continued

A4iii More than 20,000 waterbirds and 10,000 pairs of seabirds are recorded regularly at this site.

Other threatened/endemic wildlife

Green turtle *Chelonia mydas* (EN) nest all around the outside of the atoll. They have been heavily exploited and numbers are reduced.

Conservation issues

No conservation measures have been taken. There is evidence of organized poaching, which is a threat to seabird colonies, turtles and marine life. Introduced rats restrict the range of some species; eradication would be highly beneficial.

Further reading

Feare (2000), Mortimer (1984), Rocamora and Skerrett (submitted), Rocamora *et al.* (submitted), Skerrett (1996b, 1999), Stoddart (1984).

Aldabra atoll

Admin region —

Coordinates 09°26'S 46°22'E

Area 33,180 ha

Altitude 0–8 m

SC020

A1, A2 (099), A4i, A4ii, A4iii

Nature Reserve,
World Heritage Site

Site description

Aldabra is the world's largest raised coralline atoll. It is situated 640 km east of the African continent, 420 km north-west of Madagascar, and 1,100 km south-west of Mahé. It comprises four main islands circling a central lagoon, Grande Terre, Malabar, Picard and Polymnie. There are many smaller islands and islets, some of which are rat-free. The land area comprises 15,380 ha, the lagoon 22,400 ha, and the IBA also includes a coastal marine area of 10,700 ha. The terrain is characterized by irregular limestone formations called 'champignon'. The vegetation is dense and shrubby, adapted to relatively low rainfall and strong winds, and dominated in large areas by *Pemphis acidula*. Around 15% of the land area is more open, and covered in low grasses known as 'tortoise turf'. The inner rim of the lagoon is lined with mangroves. The flora is exceptionally rich in endemics, with 19 species restricted to Aldabra and 22 others found also only on other islands of the Aldabra group. There is also a pristine marine ecosystem, with an intact fringing reef and an abundant and diverse fish and invertebrate fauna. A small permanent human population is based on Picard, engaged in wardening the reserve and scientific research. There are several huts on the other main islands for the overnight accommodation of scientists and fieldworkers. In the past, the islands were exploited for mangrove wood, turtles and giant land tortoises.

Birds

See Box and for key species. The site has, unlike almost every other tropical island of comparable size in the Indian Ocean, no introduced avifauna. There is one extant endemic species, *Dicrurus aldabranus* (500 pairs), although the status of several other taxa, currently classed as subspecies, is unclear. Another endemic species, *Nesillas aldabrana*, only discovered in 1967, has not been seen since 1983, and is thought now extinct. Endemic subspecies include *Dryolimnas cuvieri aldabranus* (1,500–2,700 pairs), the last surviving flightless bird in the Indian Ocean. Another endemic form, *Threskiornis aethiopica abbotti* (100–250 pairs), is most closely related to the subspecies *bernieri* of Madagascar which, with it, may form a species distinct from populations on the African mainland. The other endemic subspecies of landbird include *Alectroenas sganzeni minor* (1,000–2,500 pairs), *Streptopelia picturata coppingeri* (2,000–5,000 pairs), *Centropus toulou insularis* (400–800 pairs), *Caprimulgus madagascariensis aldabrensis* (500–1,000 pairs), *Hypsipetes madagascariensis rostratus* (4,000–8,000 pairs), *Nectarinia sovimanga aldabrensis*, *Zosterops maderaspatana aldabrensis* (4,000–10,000 pairs) and *Foudia eminentissima aldabranus* (1,000–3,000 pairs)—all population estimates are only very approximate. The site is also important for several breeding seabirds, including the world's second-largest colony of frigatebirds (both *Fregata minor* and *Fregata ariel*) as well as, in addition to those listed below, *Sterna bergii* (60–100 pairs) and the

world's only oceanic breeding colony of *Sterna caspia* (6–10 pairs). Other breeding waterbirds are *Butorides striatus*, *Ardea cinerea*, *Anous stolidus* and *Gygis alba*. Aldabra is the only atoll in the world (and the only oceanic site other than Galapagos) where *Phoenicopiterus ruber* (25–50 birds) breeds; evidence of nesting was only discovered in 1995. The lagoon forms an important feeding area for both resident seabirds and shorebirds, and for migrants, notably *Dromas ardeola*, *Arenaria interpres* and *Sterna saundersi* (up to 800).

Key species

A1	<i>Ardeola idae</i>	<i>Nesillas aldabrana</i> (recently extinct)
	<i>Dicrurus aldabranus</i>	
A2 (099)	Aldabra EBA: All four species of this EBA occur (or occurred) at this site.	
A4i		Breeding (pairs) Non-breeding
	<i>Ardeola idae</i>	20–50 —
	<i>Egretta dimorpha</i>	1,000–3,000 —
	<i>Sterna sumatrana</i>	70–150 —
	<i>Dromas ardeola</i>	— 2,800
	<i>Arenaria interpres</i>	— 500–1,000
A4ii	<i>Phaethon rubricauda</i>	1,900 —
	<i>Phaethon lepturus</i>	2,500 —
	<i>Sula sula</i>	6,000–7,000 —
	<i>Fregata minor</i>	4,000 —
	<i>Fregata ariel</i>	6,000 —
A4iii	More than 10,000 pairs of seabirds are recorded regularly at this site.	

Other threatened/endemic wildlife

Aldabra has the world's largest population of the giant tortoise *Dipsochelys dussumieri*, estimated to number c.100,000 individuals in 1997. It is also of global importance for the sea-turtle *Chelonia mydas* (EN), which comes ashore to nest throughout the year; surveys between 1981–1985 indicated 10,000–18,000 nesting emergences annually; smaller numbers of *Eretmochelys imbricata* (CR) also breed. There are four species of lizard, including one endemic race *Phelsuma abbotti abbotti*. There are also four species of bat, including one endemic race of fruit bat, *Pteropus seychellensis aldabrensis*. A healthy population of the coconut crab *Birgus latro* (DD) exists throughout the atoll.

Conservation issues

In 1965 the atoll was threatened when the British government created British Indian Ocean Territory, comprising Aldabra, Desroches, the Farquhar atoll and the Chagos archipelago, with a view to establishing military facilities. Aldabra was the initial focus of these plans, but they were abandoned in 1967 and the lease for the atoll eventually passed to the Royal Society of UK. The Royal Society completed the construction of a research station in 1971. The lease of the atoll and its research facilities passed, in turn, to the Seychelles Islands Foundation, which was established by Presidential Decree on 2 February 1979. Aldabra was declared a World Heritage Site in 1982 and is now staffed by a warden and, usually, a scientific officer, together with about 10 support staff. The research station was rebuilt in 1995–1996, and includes an accommodation block for up to 12 visitors which, when not required for visiting scientific groups, is available to tourists. Visitor access is restricted to Picard, Polymnie and Camp Frégate (Malabar). Rats, cats and goats have been introduced in the past and pose a serious threat to both habitats and wildlife. Control programmes have been implemented, including the eradication of goats from all islands except Grande Terre. Cats have been eliminated from Picard and *Dryolimnas cuvieri* has been reintroduced to the island. Eradication of cats (now restricted to Grand Terre) from the entire atoll would be beneficial. Some poaching and illegal fishing, difficult to control due to the size of the atoll, may take place, but the remote location of Aldabra has meant that the effects of poaching in the past have been limited. Factors including the low cost of satellite navigation equipment may alter this in the future. There is a possibility of exotic bird species, including *Pycnonotus jocosus* and *Foudia madagascariensis*, reaching Aldabra from the island of Assumption, c.30 km south of Aldabra. A management plan has been prepared.

Further reading

Betts (2000), Bretagnolle *et al.* (2000), Diamond (1971, 1974, 1975b), Diamond and Prys-Jones (1986), Mortimer (1988), Prys-Jones and Peet (1980), Reville (1983).

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