

## World Heritage Sites

### Protected Areas and World Heritage



## VALLEE DE MAI NATURE RESERVE SEYCHELLES

*The scenically superlative palm forest of the Vallée de Mai is a living museum of a flora that developed before the evolution of more advanced plant families. It also supports one of the three main areas of coco-de-mer forest still remaining, a tree which has the largest of all plant seeds. The valley is also the only place where all six palm species endemic to the Seychelles are found together. The valley's flora and fauna is rich with many endemic and several threatened species.*

### COUNTRY

Seychelles

### NAME

Vallée de Mai Nature Reserve

### NATURAL WORLD HERITAGE SITE

1983: Inscribed on the World Heritage List under Natural Criteria vii, viii, ix and x.

### STATEMENT OF OUTSTANDING UNIVERSAL VALUE

The UNESCO World Heritage Committee issued the following Statement of Outstanding Universal Value at the time of inscription

#### Brief Synthesis

Located on the granitic island of Praslin, the Vallée de Mai is a 19.5 ha area of palm forest which remains largely unchanged since prehistoric times. Dominating the landscape is the world's largest population of endemic coco-de-mer, a flagship species of global significance as the bearer of the largest seed in the plant kingdom. The forest is also home to five other endemic palms and many endemic fauna species. The property is a scenically attractive area with a distinctive natural beauty.

**Criterion (vii):** The property contains a scenic mature palm forest. The natural formations of the palm forests are of aesthetic appeal with dappled sunlight and a spectrum of green, red and brown palm fronds. The natural beauty and near-natural state of the Vallée de Mai are of great interest, even to those visitors who are not fully aware of the ecological significance of the forest.

**Criterion (viii):** Shaped by geological and biological processes that took place millions of years ago, the property is an outstanding example of an earlier and major stage in the evolutionary history of the world's flora. Its ecology is dominated by endemic palms, and especially by the coco-de-mer, famous for its distinctively large double nut containing the largest seed in the plant kingdom. The Vallée de Mai constitutes a living laboratory, illustrating of what other tropical areas would have been before the advent of more advanced plant families.

**Criterion (ix):** The property represents an outstanding example of biological evolution dominated by endemic palms. The property's low and intermediate-altitude palm forest is characteristic of the Seychelles and is preserved as something resembling its primeval state. The forest is dominated by the coco-de-mer *Lodoicea maldivica* but there are also five other endemic species of palms. Located in the granitic island of Praslin, the Vallée de Mai is the only area in the Seychelles where all six species occur together and no other island in the Indian Ocean possesses the combination of features displayed in the property. The ancient palms form a dense forest, along with *Pandanus*

screw palms and broadleaf trees, which together constitute an ecosystem where unique ecological processes and interactions of nutrient cycling, seed dispersal, and pollination occur.

**Criterion (x):** The Vallée de Mai is the world's stronghold for the endemic coco-de-mer *Lodoicea maldivica* and the endemic palm species millionaire's salad *Deckenia nobilis*, thief palm *Phoenicophorium borsigianum*, Seychelles stilt palm *Verschaffeltia splendida*, latanier millepattes *Nephrosperma vanhoutteanum* and latanier palm *Roscheria melanochaetes*, are also found within the property. The palm forest is relatively pristine and it provides a refuge for viable populations of many endemic species, including the black parrot *Coracopsis nigra barklyi*, restricted to Praslin Island and totally dependent on the Vallée de Mai and surrounding palm forest. Other species supported by the palm habitat include three endemic species of bronze gecko, endemic blue pigeons, bulbuls, sunbirds, swiftlets, Seychelles skinks, burrowing skinks, tiger chameleons, day geckos, caecilians, tree frogs, freshwater fish and many invertebrates.

#### **Integrity**

The ecological integrity of the Vallée de Mai is high, but the 19.5ha that constitutes the property's size is relatively small and its present status is due to some replanting of coco-de-mer undertaken in the past. The property is embedded within the Praslin National Park (300ha) which provides a sufficiently large area to ensure the natural functioning of the forest ecosystem. To enhance the property's integrity, the World Heritage Committee has recommended extending the property to include the rest of the Praslin National Park, thus providing an appropriate buffer zone.

#### **Protection and Management Requirements**

The property is legally protected under national legislation and is managed by a public trust, the Seychelles Islands Foundation. The management of the property has been enhanced with the adoption of a management plan in 2002. Fire is considered the most significant threat to the property, and fire response and contingency plans are essential. Tourism, as managed by the public trust, makes a significant financial contribution to the protection and management of the property. The overexploitation of coco-de-mer can exhaust natural recruitment, and illegal removal of the seeds is a serious problem that affects future regeneration; thus, a key management priority is to maintain the palm forest by direct human manipulation with the collection and planting of the seeds before they are stolen and sold. Effective measures to mitigate threats to endemic fauna and flora from invasive species, pests and diseases are also essential.

#### **IUCN MANAGEMENT CATEGORY**

IV Habitat/Species Management Area

#### **BIOGEOGRAPHICAL PROVINCE**

Seychelles & Amirantes Islands (4.16.13)

#### **GEOGRAPHICAL LOCATION**

The valley is in the centre of Praslin National Park on Praslin Island, 50km north-east of Mahé in the Seychelles Islands of the western Indian Ocean at 4°19'S, 55°44'E.

#### **DATES AND HISTORY OF ESTABLISHMENT**

1948: The valley was acquired by the government as a part of the catchment area of Praslin Island;

1966: Declared a Nature Reserve under the Wild Birds Protection (Nature Reserves) Regulation S.I.27;

1978: The Coco-de-mer Management Decree passed;

1979: Praslin National Park designated under the National Parks and Nature Conservancy Act (Cap.159) S.I.57.

#### **LAND TENURE**

Government. Managed by the Seychelles Islands Foundation (SIF).

#### **AREA**

19.5ha, within Praslin National Park (342ha).

## ALTITUDE

Between ~110m and ~210m.

## PHYSICAL FEATURES

The Seychelles is a widely spaced archipelago in the western Indian ocean. The north-easternmost group consists of 41 islands of rugged preCambrian granite. Praslin Island, in the north of this group, is the second largest island, 3,756ha in area. The Vallée is in the central hills in the northeast of Praslin National Park. It is in the lower part of a valley from which two streams flow, the Nouvelle De-Couverte and Fond B'Offay rivers, flowing west and east respectively, though it does not include all of their headwater catchments. The site was untouched palm forest until the 1930s when development of a plantation of exotic trees and the exploitation of coco-de-mer palm seeds began. Drier hills on the edge of the valley have suffered soil erosion as a result of forest fires and deforestation, so that the soil is degraded and the forest is secondary growth. However, most of the valley is still in a near natural condition.

## CLIMATE

The climate is humid tropical with annual temperatures varying between 24° and 32°C. Annual rainfall on Praslin is about 2200mm. There is a drier season during the south-east monsoon from April to September and a wetter slightly warmer season during the northwest monsoon between October and March. The island lies north of the cyclone belt and has been relatively free from strong winds (Walsh, 1984) SIF, pers.comm., 1995) though the incidence of major storms is increasing (Lundin & Linden, 1995). For instance a mini-cyclone affected Praslin and nearby islands in September 2002, causing significant damage (UNEP, 2003).

## VEGETATION

The rainforest of the Vallée de Mai is an outstanding example of a stage in the development of the world's flora before the evolution of more advanced plant families (IUCN, 1983). Three main vegetation types occur in the site: valley palm forest, intermediate palm forest and secondary forest on eroded land. The site is too small to be self-sustaining, and several endemic species are maintained only through human agency. But it does contain all the ecological components needed for the continued existence of the extremely rich endemic flora: 28 endemic plants, including four screwpines and 14 broadleaf trees.

The palm forest is characterised by the endemic coco-de-mer palm *Lodoicea maldivica* which has the largest seed in the plant kingdom, weighing up to 18kg, and has been much sought after for that reason. Its canopy reaches 30m high. All six palm species endemic to the Seychelles occur in the valley, all belonging to monospecific genera. As well as coco-de-mer there are millionaire's salad *Deckenia nobilis* (VU), thief palm *Phoenicophorium borsigianum*, Seychelles stilt palm *Verschaffeltia splendida*, latanier palm *Roscheria melanochaetes* and latanier millepattes *Nephrosperma vanhoutteana*.

The intermediate palm forest is intermixed with endemic broadleaved trees such as *Northea hornei* (VU) and *Dillenia ferruginea* (VU) and with endemic screwpines such as *Pandanus hornei* (VU) and *P. sechellarum* (VU). The endemic sedge *Mapanea floribundum* grows in more open and rocky places, and a dense growth of the sedge *Scleria sumatrensis* occurs on open, marshy patches on the forest floor. Areas on the edge of the valley where the soil has been degraded by burning have been recolonised by endemics such as *Paragenipa wrightii*, *Pandanus multispicatus* (VU), *Phoenicophorium borsigianum*, *Memecyclon eleagni* (VU), *Syzygium wrightii* (VU), *Deckenia nobilis*, and the vine *Secamone schimperiana*, or by planted indigenous species such as *Calophyllum inophyllum* and *Intsia bijuga* (VU), and exotic species such as *Tabebuia pallida*, red sandalwood *Adenanthera pavonina* and coco plum *Chrysobalanus icaco* (SIF, pers. comm., 2006).

## FAUNA

The site is a BirdLife International designated Important Bird Area. Its most notable bird is an endemic subspecies of black parrot *Coracopsis nigra barklyi*, restricted to Praslin Island and dependent on the Vallée de Mai and the surrounding palm forest. *Leptailurus serval* The population in 2001 was 200-400 birds. Other notable birds include the endemic Seychelles bulbul *Hypsipetes crassirostris*, Seychelles blue pigeon *Alectroenas pulcherrima* and sunbird *Nectarinia dussumieri*, the re-introduced Seychelles kestrel *Falco araea* (VU) and the endemic cave-nesting Seychelles swiftlet *Collocalia elaphra* (VU). Exotic birds include Indian mynah *Acridotheres tristis* and barn owl *Tyto alba affinis*. The only two indigenous mammal species are the endemic Seychelles flying fox *Pteropus seychellensis*, which roosts in the Reserve, and Seychelles sheath-tailed bat *Coleura seychellensis* (CR). Also occurring is the introduced tenrec *Tenrec ecaudatus* from Madagascar.

Reptiles include the endemic tiger chameleon *Calumma tigris* (EN), Seychelles house snake *Lamprophis geometricus* (EN), Seychelles wolf snake *Lycognathophis seychellensis* (EN), the introduced blind snake *Ramphotyphlops braminus*, endemic Seychelles giant and small day geckos *Phelsuma sundbergi* and *P. astriata*, Seychelles bronze-eyed gecko and skinks *Mabuya sechellensis*, *Scelotes gardineri*, and *S. braueri*. One endemic the Seychelles tree-frog *Tachycnemis seychellensis*, and the introduced Mascarene grass frog *Ptychadena mascareniensis* are known from the area. Six species of endemic worm-like caecilians are known to occur in the deep beds of moist humus, but are rarely seen. The stream contains the endemic freshwater crab *Seychellum alluaudi*, giant crayfish *Macrobrachium lar* and shrimps *Caridina* spp. (Bosc, 2004). Two endemic snails which occur are brown snail *Stylodonta studeriana* (EN) and blackfish snail *Pachnodus praslinus* (VU). There is also a range of orthopterid insects (SIF, pers. comm., 2006) and a recently discovered fruit fly *Drosophila sechellensis*, associated with coco de mer fruits that have been dehusked (SIF, pers. comm., 2006)

## CONSERVATION VALUE

The scenically superlative forest palm forest of the Vallée de Mai is a living museum of a stage in the evolution of the world's flora before the development of more advanced plant families. It is also the site of one of the three main populations of coco-de-mer remaining in Seychelles. The coco de mer palm is notable for its seeds, the largest of all plants', and for the very large leaves of the juvenile palms. Vallée de Mai is the only place where all six palm species endemic to the Seychelles are found together. The valley's flora and fauna is rich with many endemic and several threatened species. The Park lies within a Conservation International-designated Conservation Hotspot, a WWF Global 200 Eco-region, a WWF/IUCN Centre of Plant Diversity and is one of the world's Important Bird Areas.

## CULTURAL HERITAGE

The first record of the islands was on a 9<sup>th</sup> century Arab chart. The first recorded landfall was in 1609, after which the islands became a popular port of call for pirate ships. The French claimed the islands in 1754, when bringing slaves from Africa, and named them after their finance minister, and Praslin Island after the minister for the navy. The British succeeded them in 1815 and many freed slaves were settled in the country but the culture remained largely French-influenced (Creole). Immigrants from Asian countries also arrived, many intermarrying with local people and the population reflects this very mixed background. Much use was made of the coco de mer palm between the 18<sup>th</sup> and early 20<sup>th</sup> centuries, with trunk and leaves being utilised in house building, young nuts used as food and mature nuts fashioned into containers and household implements.

## LOCAL HUMAN POPULATION

There are no inhabitants in Vallée de Mai, although there is a forestry settlement in the National Park where forest and park rangers live, but the surrounding population of Praslin Island is increasing.

## VISITORS AND VISITOR FACILITIES

The Park is popular and well visited. 41 to 48% of all visitors to the country visit Vallée de Mai. Visitors to Seychelles in 2005 numbered 129,333, with 82% being from Europe (SIF, pers. comm., 2006). Access is from the main road. There is an information centre and a small shop by the entrance. Access

within the Reserve is restricted to a carefully designed system of marked paths, and guided tours are available (SIF, pers. comm., 1995).

## **SCIENTIFIC RESEARCH AND FACILITIES**

The palm forests are of great botanical interest. Some work has been done by individual researchers on the black parrots and on palm geckos. Savage & Ashton studied in 1976 the population structure of all palm species and calculated a growth rate for *Lodoicea maldivica*. An age table related to the height of the trees was generated. In 1985 the Expedition from Oxford University established six permanent sample plots and again analysed the population structure of *Lodoicea* but also looked at the forest composition. In 1998 the Geobotanical Institute Zürich resurveyed the permanent sample plots and found that the palm forest was well managed and that invasion by alien species is moderate. Research in the population structure has continued and it was found that the human impact on the Vallée de Mai population was underestimated (Fleischer-Dogley & Kendle, 2002). A U.K. University Expedition in 1976 studied forest regeneration, the Seychelles fruit bat, tenrecs and black parrot (Ascroft *et al.*, 1976 & 1977). Savage & Ashton have studied the population structure of the coco-de-mer palm (1983) and the impact of tourism (1991). A Science Workshop was held in 2006 to prioritise research needs and efforts will be made to encourage further research in Vallée de Mai. There are currently no research facilities on site.

## **MANAGEMENT**

Since January 1989 the management of Vallée de Mai has been entrusted to the Seychelles Islands Foundation (SIF): this NGO also manages Seychelles' other World Heritage Site, Aldabra Atoll. Management policies were originally set by the Seychelles National Environment Commission. A management plan for Vallée de Mai was prepared in 2002, to serve until 2008. The firebreak around the Reserve is regularly maintained and alien species are controlled. The Reserve itself is a strictly protected zone within the surrounding Praslin National Park. The trade in coco-de-mer nuts is controlled by law. A registration system for selling the nuts seems to facilitate control, together with enforcement of the Coco de Mer Management Decree of 1994. At present the palm forest must be maintained by collecting and planting the seeds before they are stolen for sale.

Before 1930 a private owner logged the timber in the valley and introduced many exotics such as coffee, patchouli *Pogostemon cablin*, cinnamon *Cinnamomum verum*, *Psidium cattleianum*, *Paraserianthes falcataria* and *Epipremnum* spp. which the present management for many years has been replacing with native palms. Expansion of the World Heritage site across the road from the Vallée, to include an area of high quality forest which has a large population of coco-de-mer, was recommended by the original IUCN evaluators who also recommended extending World Heritage status over the whole of the National Park, as a buffer to ensure the continuing integrity of the forest and to encourage the implementation of the existing management plan (IUCN, 1983). In 2006 the Seychelles Government approved an extension of the area under SIF management (known as Fond Peper), although the area still has to be officially surveyed and the lease finalised. SIF is to sign a Memorandum of Understanding with the Department of Environment to formalise the management of this extended area.

## **MANAGEMENT CONSTRAINTS**

There are difficulties in effectively patrolling the area, and poaching of coco-de-mer nuts is a serious problem that affects future regeneration. There is considerable risk of fire, although all smoking or use of fire is prohibited in the Reserve. As the island is small but increasingly dependent on the growth of tourism, constant monitoring will continue to be necessary to prevent abuse. Another potential problem is that the site does not include the whole water catchment area of its streams and the island's population and water needs are growing rapidly. Activities of any type on the slopes above the valley within the National Park could adversely affect the site itself. Threats to endemic birds from rats and feral cats are being met by specially prepared rat-proof nesting boxes for the black parrots (SIF, pers. comm., 1995). Well trained and motivated staff are sometimes difficult to retain.

## STAFF

A warden, assistant warden, 3-4 rangers and maintenance staff are employed by the Seychelles Islands Foundation.

## BUDGET

The admission charges pay for its upkeep (and for Aldabra Atoll) but are not used for the National Park.

## LOCAL ADDRESSES

Chairman, Seychelles Islands Foundation, PO Box 853, Victoria, Seychelles

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The principal source for the above information was the original nomination for World Heritage status.

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**DATE**

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