

UNESCO WORLD HERITAGE CONVENTION PERIODIC REPORT
PART 11

II.1 INTRODUCTION

a) State Party/Country

Republic of Seychelles

b) Properties as inscribed on the World Heritage List

- 1) Vallee de Mai Nature Reserve
- 2) Aldabra Atoll

c) Geographical coordinates

- 1) Vallee de Mai: Longitude 55°44' 15E ; Latitude 4°19'45S
- 2) Aldabra: Longitude 46°25'E Latitude 9°25'S;

d) Date of Inscription on the World Heritage List

- 1) Vallee de Mai: 9th December 1983
- 2) Aldabra: 17 December 1982

e) Organisation responsible for the preparation of the report

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f) Date of Report

November 2001

g) Signature on behalf of the State Party

Ronny JUMEAU
MINISTER OF ENVIRONMENT
November 2001

II.2 STATEMENT OF SIGNIFICANCE

II.2.1 *Information provided at the time of inscription*

Justification for inscription provided by the State Party

1) Vallee de Mai: Natural Criteria: i, ii, iii, iv

A nature reserve, which forms the nucleus of the Praslin National Park, The Vallee de Mai palm forest has been preserved in something like its primeval state. Of the six species of endemic palms of Seychelles, all six grow in the Vallee de Mai. Notably the forest is the stronghold of the Coco de Mer which produces the world's largest seed at some 10-20 kilos. Of the 80 or more additional endemic plant species found in Seychelles 30 have been recorded from the Vallee de Mai.

There are also a number of endemic animal species, which inhabit the reserve, namely the Seychelles Black Parrot, which only breeds on the island of Praslin, freshwater crabs, prawns, and tiny shrimp, the only endemic species of freshwater fish, two endemic species of snail, a very rare endemic chameleon and three species of endemic snake.

2) Aldabra

Aldabra: Natural Criteria: i, ii, iii, iv

Aldabra atoll was reported to meet all four of the criteria for recognition as a natural heritage property and meets the condition of integrity of each:

It is an outstanding example of a major stage in the evolutionary history of Earth. The atoll is a classic atoll formation with the key elements of reef, island rim and lagoon which display a comprehensive range of geomorphological processes which have taken place and the results. It is a superlative example of an oceanic island ecosystem in which evolutionary processes are active. The atoll is a refuge harbouring viable populations of a range of rare and endangered species.

The foregoing features are not only among the most distinctive of their kind, but are combined to form an array of unquestionable global significance. .

Observations made by the advisory body

1) Vallee de Mai

The condition of the site was reported as good. Work and research were urgently recommended in 3 main areas: -

- i) Elimination of invading exotic species like *Albizia falcataria*, *cinnamomium zeylanicum*, *Paidium cattleianum* and *Philodendron*
- ii) Because of the large amount of dry leaves and litter fire was a real risk. Regular maintenance of firebreaks and a gang of fire fighters on standby was recommended.
- iii) All Coco de Mer nuts produced are collected. It was recommended that at least in some areas a certain proportion should be allowed to germinate to maintain the population structure.

2) Aldabra

The condition of the site is excellent. Nevertheless, the maintenance of the conservation interest and realisation of the full scientific value of the site is dependent upon the ability of SIF to support adequate wardening staff and functioning research station. The Foundation is dependent upon subscription and donation income, a shortage of funds may therefore constitute a potential danger.

Observations made by the World Heritage Committee at the time of inscription.

1) Vallee de Mai

It must be noted that the WHC nomination document that outlines the decision of the World Heritage Committee during its 13th session providing a synopsis of its decision and brief description for the incorrect property. The property described lies in the domain of Mauritania. A copy of this document is attached.

2) Aldabra

The WHC nomination document notes that the Committee made no statement concerning its decision. A brief description of the property was documented describing the property as four isolated coral islands surrounded by coral reef,

which enclose a shallow lagoon. The atoll being protected from human influence is described as a refuge for the world's largest tortoise population.

II.2.2 Update of the statement of significance

Submission of statement of significance

A revised statement of significance is required and is hereby submitted in recognition, identification and knowledge of specific outstanding universal values of both sites.

New statement of significance

1) Vallee de Mai

Criterion (i)

The property is an outstanding example of a major stage in the evolutionary history of Earth in that its ecology is dominated by endemic palms. It is a palm forest preserved in something like its primeval state, dominated by the famous and unique Coco de Mer (*Lodoicea maldivica*). The population is substantial and, with continued protection, is self-sustaining.

Criterion (ii)

The habitats provided a refuge that harbours viable populations of endemic species of endemic flora and fauna providing outstanding examples of significant on-going ecological and biological processes in the evolution and development of terrestrial, and freshwater ecosystems and communities. An example is the unique association between endemic geckoes and the male inflorescences of the Coco de Mer.

Criterion (iii)

An area is of exceptional natural beauty where a concentration of diverse and unique plants and animal species thrive. The lush vegetation that largely features the Coco de Mer palm (*Lodoicea maldivica*), produces the largest seeds of the Plant Kingdom. The juvenile leaves of the Coco de Mer are also strikingly beautiful and amongst the largest leaves of any leaving plant.

Criterion (iv)

The area is rich in biodiversity and the habitat of rare and endangered species of flora and fauna. The region is the type locality and world's stronghold for the Coco de Mer (*Lodoicea maldivica*), Seychelles Black Parrot (*Coracopsis nigra barklyi*), and endemic fresh water fish (*Pachypanchax playfairi*,) in particular. The forest is the habitat of many other endemic plant and animal species, the area represents a remarkable concentration of outstanding natural wealth of the highest importance to science and conservation.

2) Aldabra

Criterion (ii)

The atoll is a superlative example of an oceanic island ecosystem in which evolutionary processes are active within a rich biota. The size and morphological diversity of the atoll has permitted the development of a variety of discrete insular communities with the high incidence of endemism among the constituent species that are typical of island ecosystems. The natural processes take place with minimal human interference and can be clearly demonstrated in their full complexity.

Criterion (iii)

Aldabra atoll encompasses a large expanse of relatively untouched natural beauty. The atoll's remarkable land formations and its process provides a unique spectacle of natural phenomena. Because of its isolation and antiquity Aldabra is home to a unique assemblage of flora and fauna which remained significantly less disturbed than most other atolls in the world.

Criterion (iv)

Aldabra Atoll provides a natural laboratory for the study of the process of evolutionary ecology and is a platform for key scientific discovery. The atoll constitutes a refuge harbouring viable populations of a range of rare and endangered species of plants and animals. These include; the world's largest population of Giant Tortoise (*Dipsochelys dussumieri*), which is self-sustaining and all the elements of its inner-relationship with the terrestrial environment are evident; one of the largest congregations of nesting Green Turtles (*Chelonia mydas*) in the Indian Ocean, the world's second largest breeding population of Frigatebirds, (*Fregata minor and Fregata ariel*), and the last surviving flightless bird species in the Indian Ocean, the Aldabra Rail (*Dryolimnas (cuvieri) aldabran*). Other remarkable examples include about 40 endemic species of plants, many endemic species of invertebrate and an exceptional marine ecosystem.

Note: At the time of inscription the property was nominated by the State Party but not listed by the World Heritage Committee under criteria (i). This is an issue which should be reconsidered on the basis of its significance as an on-going geological process in the development of landforms and its significant geomorphic features of which it is an outstanding example.

Aldabra is a classic atoll formation in its entirety with all the key elements i.e. reef, island rim, lagoon included within the proposed site. Most significantly, arguably the largest raised coral atoll in the world. The key elements are sufficiently extensive to display a comprehensive range of geomorphological process, which may take place, as the results of these processes.

Delimitation of the World Heritage Property

1) Vallee de Mai

The current delimitation of the property is thought to be adequate. Nevertheless, the SIF Board of Trustees in liaison with the Government is considering an extension of the reserve area to help curb Coco de Mer poaching in the immediate vicinity of the Reserve. A response is anticipated by end 2001.

2) Aldabra

The technical review of the sites reports that the boundaries as described in the nomination are ecologically viable though it would be preferable if the seaward boundary were extended some 20 km into the sea in order to provide additional protection to the marine fauna, but this is not practicable. Commercial exploitation remains a threat.

The main threats to the property that delimitation policies would prohibit are fishing in the reserve area, damage to the coral reef from sea vessel mooring, and safeguards in the event of oil spills from larger vessels travelling in the region.

Increased patrols in the reserve area would help deter fishing within the reserve, though given the magnitude of the atoll, the costs involved in supplying adequate manpower and equipment to thoroughly survey the entire reserve would not justify the use of necessary resources.

At present a 12 mile exclusion zone is regulated around Seychelles. In addition, there is a 5-mile exclusion zone around Aldabra, which the SIF Board wishes to extend the zone to 15 miles to protect the reserve from any ill effects in the event of an oil spill.

No mooring buoys for visiting sea vessels are present on Aldabra. A project to install a number of weight-limited buoys within Seychelles has been initiated by a non-governmental organisation, the Marine Conservation Society of Seychelles. This project would include Aldabra.

II.3 STATEMENT OF AUTHENTICITY/INTEGRITY

Evaluation of the authenticity/integrity of the property at the time of inscription

1) Vallee de Mai

It was reported that the survival of the Valle de Mai in such a densely populated island is a remarkable achievement. It is far too small to survive on its own in any natural way, and its present status is due to some pre-planting of Coco de Mer. Though not self-sustaining, it is still the only place that contains the ecosystem components required for the continuity of the species being conserved. Management activities are sound.

The Vallee de Mai occupies the lower parts of a valley towards the head of a stream, but does not include the whole water catchment area. This does not affect the visual impact of the site, but activities on the slopes above the valley could adversely affect the site itself.

2) Aldabra

Aldabra is an outstanding example of biological evolution, contains superlative natural phenomena, and contains the only habitat where a number of animals of outstanding universal value can survive.

Changes in the authenticity/integrity since inscription.

There are no foreseen changes in authenticity/integrity to either property foreseen in the near future. The criteria on the basis of which the properties were inscribed has been maintained

11.4 MANAGEMENT

II.4.1 *Legal and institutional framework*

Ownership

The Government of Seychelles owns both properties. Its patron, the President of the Republic, vested the management of both sites to the Seychelles Islands Foundation. There has been no formal agreement in terms of the lease of the properties in terms of management.

Agency responsible for the management

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Actions foreseen to preserve the values for the future

1) Vallee de Mai

The new management plan reviewed annually and periodically updated by the SIF will be the key instrument to preserve immediate and future values of the property as described in the statement of significance. The Environment Management Plan for Seychelles (EMPS) will largely support these initiatives. The four-year UNESCO/IUCN Enhancing World Heritage Sites programme recently initiated will provide a solid grounding for management of all future management activities

2) Aldabra

The current management plan which is reviewed annual and to be updated in 2003 is the key instrument to preserve immediate and future values of the property as described in the statement of significance, supported by the EMPS. The recently initiated four-year UNESCO/IUCN Enhancing World Heritage Sites programme will provide a solid grounding for management of all future management initiatives.

II.4.2 *Management and planning*

Changes since inscription

SIF remains the authority under which both properties are managed under the mandate of the 14 member Board of Trustees. There have been no changes in ownership, legal status, protective measures, boundaries, or available resources since inscription. A proposal has been submitted to government recommending an extension of the Vallee de Mai boundaries, an issue which is still under review.

Registered plans relating to the property

Current Management Plan for Aldabra attached.

II.4.3 *Management plan of the site and statement of objectives*

1) Vallee de Mai

The first management plan is currently in production with a completion date of end 2001. The local community has been consulted by way of stakeholders meeting. The new management plan will incorporate available human resources, financial resources, zoning and multiple uses of the site, delimited buffer zone, and monitoring actions of the site.

The SIF will implement the management plan in accordance with the current legislation for the protection of nature reserves in Seychelles. The management plan will run for 5 years when it will be revised and updated by the SIF in liaison with a specialist consultant.

The Dutch Trust Fund provided financial support for the production of the plan. No additional funds have been earmarked for its implementation outside of funds and resources already allocated for SIF management.

Obstacles to the implementation of the management plan would result from insufficient funds and limited administrative staff.

2) Aldabra

The current management plan produced in 1998 will run to 2003 and is implemented in accordance with the current legislation for the protection of a Special Nature Reserve.

The management plan takes into account human resources, financial resources, personnel training, and regular monitoring activities at the site. The community was not consulted in the management plan process. A revision of the current management plan is being considered and a project proposal to be initiated in 2002 when a donor will be sought to provide funding for the project.

Obstacles to the implementation of the management plan would result from insufficient funds and limited administrative support staff.

II.4.4 Capacities in human and financial resources at site level

Human Resources

SIF Headquarters (Administration for both sites)

Management: Executive Director and Executive Officer
Managerial: Assistant Executive Officer
Secretarial: 1 Clerk/Receptionist

1) Vallee de Mai

Management: Warden
Manpower: 4 Rangers
Unskilled: 2 Labourers and 2 Cleaners for routine site maintenance work.

2) Aldabra

Management: Warden, Scientific Research Officer, and Logistics Manager
Manpower: 4 Rangers, 1 Engineer
Workers: 2 Boatmen, 1 Cook
Unskilled: 2 Labourers and 1 Cleaner for routine Research Station and site maintenance work.

Regular Financial Resources

Government:	Sr 100,000 pa
Royal Society:	PS 5,000 pa
Entrance Fees:	Sr 2,687,100 pa
Merchandise Sales:	Sr 4,521 pa
Coco de Mer Sales	Sr. 267,000 pa
Filming Fees:	Sr 52,939 pa
Landing Fees:	Sr 50,000 pa
Donations:	Sr 24,954 pa
Kiosk Rental:	Sr 84,000 pa

(*Extracts from the most recent audited accounts figures currently available).

All earnings are utilised towards the day to day running of the sites. Income generated from the Vallee de Mai site highly subsidises all SIF activities. Approximately Sr 80,000 is contributed towards and annual school trips to Aldabra.

Personnel Training Needs

Training is urgently required across the board at both sites, particularly at management level, rangers, and any staff involved in scientific monitoring. Some training needs were identified and compiled in a report in 2001. To summarise, the following staff training courses would be most beneficial.

- Computer technology
- Scientific Monitoring techniques
- Data collection
- Staff management
- Reporting
- Fundraising
- Basic Finance
- First Aid
- Boat handling and navigation
- Dive training

II.4.5 Additional information concerning protection and conservation

Sources of expertise for training in conservation and management techniques.

Very limited training opportunities exist for conservation or management. Researchers temporary posted at either site provide some sharing of expertise. At Management level no programme or courses have been run in-house, though some external courses have been taken up by management staff. Some externally funded workshops have been attended by staff. A small training allowance has been allocated in the annual budget for each site.

Technical Assistance provided by international agencies

IUCN have readily offered technical assistance for World Heritage projects.

II.4.6 Scientific, technical and educational activities

Scientific studies

1) Vallee de Mai

There are no on-site research facilities, or skilled scientific personnel who are contracted to work specifically at the site. Research is often conducted by visiting scientist or Ministry of Environment personnel using government or independent facilities.

A limited number of zoological specimens are kept at the national Natural History Museum. There is up to date database of information on the site.

2) Aldabra

A scientific research officer is continuously posted on Aldabra to conduct and manage monitoring and research duties with the assistance of boatman and rangers. There are a number of staff which travel between various camps situated on the atoll to conduct monitoring activities. A good standard of housing is available for a limited number of researchers.

There is one small laboratory on site equipped with very limited facilities and supplies.

A computer database on site stores monitoring, coral taxonomy, and library reference data.

The zoological collections are sparse but do include some butterflies, moths, reptile and bird eggshells, turtle hatchlings and a few miscellaneous specimens. There is a herbarium collection that is reported to be in poor physical condition.

New management techniques

1) Vallee de Mai

There are no on-site computer facilities of any kind. Site staff relies on SIF HQ for these facilities.

2) Aldabra

There are adequate computer facilities at SIF HQ and on site at Aldabra for complete database and document management including e-mail, spreadsheet, and GIS software.

Educational activities

1) Vallee de Mai

The site receives on average 5 school/youth club group visits per year. An annual national exhibition was launched in 2001 primarily aimed at school children that participate in setting up the exhibit which runs for one week.

The theme of exotic invasive plant species eradication is a common focus for public participation in conservation activities at the site.

2) Aldabra

There has never been a formal education policy relating to either site, but SIF have recently endeavoured to nurture a relationship with the Ministry of Culture and the Ministry of Education, which has been enhanced by an annual trip to Aldabra for school competition winners and the top students in Geography and Biology. The idea of an Aldabra club for past and present school visitors was proposed at a recent SIF Board of Trustees meeting. An initiative which is likely to be implemented in 2002.

Books on Aldabra are regularly offered as prizes to winners of various school-based initiatives.

Public information and awareness building

Public information activities relating to the sites which promote World Heritage values are transmitted to the local population via the written and visual media, SIF brochures, website, newsletter, and the Ministry of Tourism and the Ministry of Environment publicity activities and publications.

II.4.7 Diverse elements

1) Vallee de Mai

- A well-defined metal placard embossed with SIF and UNESCO World Heritage Site logos is posted at the entrance to the property.
- Although there is no visitor's information/interpretation centre or site museum staff are readily available to answer queries and guided walks are available upon request.
- A well-defined and marked trail provides access to all visitor areas. Guided walks are available upon request.
- Lodging facilities are not available on site. There is a privately run snack bar/gift shop kiosk adjacent to the site to accommodate visitors.
- Parking and toilet facilities are available but not always adequate to meet demand. Plans for expansion of these facilities are in progress.
- First aid and rescue facilities are met by the local health authorities and are within easy reach.
- Video tapes, books and a trail leaflet are available from the on site kiosk, SIF HQ and other local merchants
- Admission to the site is free of charge to local residents year round and one day per year to all visitors during national Tourism Week.
- A national Vallee de Mai Expo takes place annually in the month of June.
- The number of visitors to the site has been growing steadily since inscription.

2) Aldabra

- A well-defined metal plaque embossed with SIF and UNESCO World Heritage Site logos is situated near the Research Station. Although there is no visitor's information/interpretation centre or site museum, staff are readily available to answer queries and accommodate and guide visitors.
- All trail walks and boat excursions must be accompanied by site staff in the interest of public safety and preservation of the site.
- There are limited board and lodging facilities for visitors.
- Books and videos are available to visitors on site, SIF HQ, and local merchants on the inner islands.
- Visitor numbers have increased marginally since inscription.

Necessity of revisions to legislative texts

Some revision of legislative text governing the property may be in order to provide greater environmental protection of both sites, subject to the discretion of the Board of Trustees.

II.5 FACTORS AFFECTING THE PROPERTY

II.5.1 Degree to which the property is threatened

Development pressures

1) Vallee de Mai

The site is visually appealing with an absence of any construction or building works in progress in the immediate vicinity. The adjacent gift shop, snack bar, and SIF office has a simple rustic look that nicely blends with the landscape.

There are no threats or pressures at the site in terms of roads, dams, mines, water, air pollution or earth pollution. A number of invasive vegetal species are under close monitoring and are removed periodically by SIF staff.

Due to seasonal increases in visitor arrivals more tourist facilities at the property will be provided but will not sacrifice the visual, structural, or functional integrity of the site.

2) Aldabra

Since the reserve is self-contained and there is no permanent population on the atoll, the site is well protected against threats to its visual or structural integrity. In terms of functional integrity, the SIF management plan is geared towards conservation of biological productivity, conservation diversity, and the functioning of natural cycles.

Environmental pressures

1) Vallee de Mai

The site remains in a similar state as it was upon inscription. Biodiversity has been maintained with no significant reduction of animal or vegetable species, neither has there been any reintroduction of animal or vegetable species. There has been so significant rehabilitation of ecosystems or natural environment. One of the greatest threats to structural integrity has been invasive exotic plant species. This threat has been kept under control by SIF staff. A monthly reports provides data on the type and number of species removed from the Reserve.

2) Aldabra

Aldabra remains a site of remarkable biodiversity with a good quality of life sustaining systems and biological productivity.

A trail clearing project initiated in 2001 may have some impact on the vegetation cover. The impacts of which is not immediately known.

There has been no critical or permanent reduction of animal or vegetable species though a decline in the Giant Tortoise population due to climatic changes has been noted in specific areas, while a slight increase in the tortoise population in others. This is thought to be due to natural population fluctuations. A more intensive monitoring programme is planned for 2002.

In 1999 a White-throated Rail re-introduction project was initiated to re-establish a population in an area where they once thrived has shown some success.

A programme to eradicate the feral goat population was first launched in 1987,

1988 and again in 1994/5 with limited success. A goat eradication relaunch programme is proposed in 2002, along with a programme for cat and rat eradication.

Natural threats and possible catastrophes

1) Vallee de Mai

Soil erosion is a potential threat in the event of the more dominant threat of fire risks due to the amount of dry leaves at the site. SIF staff continually maintains a large firebreak. The threat of arson would be the most likely cause of fire in the reserve, or visitors disobeying the no smoking ban. A sprinkler system to combat fire is currently being discussed at Board level.

2) Aldabra

Drought has periodically been a problem on the atoll and is a potential threat to the full range of flora and fauna. Drought has been identified as the primary cause for the recent Giant Tortoise decline. Fire is a secondary threat.

Tourism and its consequences

1) Vallee de Mai

The Vallee de Mai is easily accessible by paved road and is within easy reach of the airport. The site, which is only 19.5 hectares, is connected by a series of trails not accessible internally by car. There is no wheelchair access at present. A short wheelchair accessible circuit is being considered.

Tourism at the reserve provides the major source of revenue for both sites via ticket sales. The in-flux of tourist has not had a significant impact on the integrity of the site with the exception of wear on the paths that are presently in need of some maintenance.

The site currently receives well over 60,000 visitors per year. Up to 50% of the 130,000 overseas visitors to Seychelles visit the island of Praslin where the reserve is situated. A substantial number of tourists visit the Vallee de Mai. Since inscription of the site the number of visitors has gradually increased which coincides with the number of tourist visiting Seychelles. The total income generated from tourist in ticket and Coc de Mer sales, filming fees, and merchandise sales exceeds Sr 2.5 million per annum. The site is well managed and one can speak of sustainable tourism in light of the fact that the site contributes largely to its counterpart Aldabra in terms of financial resources.

Waste management is well controlled by SIF staff. A litter-monitoring programme was initiated in 1999 to control waste on the outskirts of the perimeter as well.

There is a reasonable tourism infrastructure at the site in the form of path markers, benches, rest areas, and waste bins.

The capacity of the site is the subject of ongoing discussions at SIF Board of Trustees level.

2) Aldabra

Tourism remains on a small scale at the site due to its remote location and difficult access, by a limited number of boat operators and only one air charter company service to the nearby island of Assumption (619 nautical miles from the capital island of Mahe), where visitors by air must transfer to Aldabra by sea. The site is not suitable for immobile, elderly or handicapped visitors.

SIF promote non-consumptive boat based tourism. There is some internal pressure to earn more revenue from ecotourism so that the site may become more sustainable financially.

The number of visitors to the atoll has not changed significantly over the years. The annual number of is under 500. On average there are 2-3 cruise ship visits to the atoll per year. Most other tourist arrives by private air/sea charter.

The annual income from tourist is around the Sr 200,000 mark, which comprises landing fees, filming fees, research facilities and a percentage of merchandise sales.

Collection of samples of flora and fauna at the site is strictly prohibited. This regulation is largely adhered to by visitors.

Waste management does not pose a significant problem given the limited number of visitors and staff posted on the atoll. Nevertheless, a waste collection programme has been implemented by the current Warden as of 2001.

There is very little tourist infrastructure on the atoll, though the staff at the research station readily provide services and facilities required by visitors upon request in liaison with Headquarters.

There are no clear signposts on site for visitors but some trail markers are present.

There are 6 double rooms to accommodate visitors and researchers alike. Live aboard sea vessel accommodation is highly recommended. At present the tourist capacity is limited but adequate to accommodate the small number of annual visitors.

Relations with the neighbouring residents of the site

1) Vallee de Mai

There are no inhabitants living within the reserve itself. The reserve is situated on the island of Praslin which has a population of 6,410 inhabitants. The main socio-economic activities involve tourism. The nearest village to the reserve is Fond B'offay with a population of only 40. The nearest inhabitant lives 1 kilometre from the reserve.

The chief natural resource extracted from the reserve is the Coco de Mer nut which is a valuable commodity on the local tourist market. The problem of Coco de Mer poaching has long been a problem throughout the island of Praslin, which is the world's stronghold of this endemic botanic specimen.

SIF have endeavoured to protect the Coco de Mer from poaching which is a difficult and potentially dangerous task due to its market value of Sr 800 – Sr 2000, and the large reserve perimeter. The SIF Board of Trustees have proposed an extension of the Vallee de Mai for added protection to the surrounds of the reserve where there is also an abundance of the Coco de Mer.

The threat of poaching is not significant on the whole but is on the increase as the economy in the country falters and the number of Coco de Mer declines marginally compared to decades past.

The community was not involved in the nomination of the site to the World Heritage list. An issue, which must be rectified in any future nomination.

2) Aldabra

The local population are SIF workers that number between 8 – 14 at any given period. The nearest inhabitants are approximately 50 kilometres away on Assumption Island and number less than 10.

Poaching of fish, turtles, tortoises, molluscs and birds has always been a problem at the site but is thought to have decreased in recent years due to increased surveillance by management staff. Given the great size of the atoll and the lack of

suitable patrol boats or human resources to patrol the entire area, any accurate figure of poaching incidents is unknown.

The community was not involved in the nomination of the site to the World Heritage list.

11.5.2 Prevention of threats and natural and human pressures

1) Vallee de Mai

In addition to the regularly maintained firewall, greater fire surveillance facilities for the area has been installed by the Ministry of Environment by way of a new fire tower manned by government personnel. The government has also acquired *Bambi buckets* for air born fire control in the event of fire in areas difficult to access, as well as areas where a water source is not readily available.

Urbanism is unlikely to pose any risk in the foreseeable future. Building restraints remain in place within one kilometre of the reserve.

Tourism is limited by the number of visitors entering the country which is likely to remain moderate over the next decade.

2) Aldabra

The problem of drought is thought to be due to natural fluctuations and does not pose serious or enduring threats to the ecosystem as a whole.

II.6 MONITORING

Previous monitoring exercises

1) Vallee de Mai

Long-term scientific monitoring activities have not taken place at the site. Specific studies have been carried out by the Ministry of Environment and independent scientists over short periods. (See I.3 c)

2) Aldabra

Previous and ongoing monitoring exercises

There are several long-term monitoring programmes in place on Aldabra, some of which date back to the 1970's. The specific resources monitored have been prioritised and outlined in the Aldabra Management Plan 1998-2005.

Periodic monitoring of fauna resources

Most of the long-term monitoring of Aldabra fauna has focused on population studies with a strong emphasis on a limited number of terrestrial species (mainly Reptilian and Avian). The species that form part of the long-term monitoring (as outlined in the Management Plan) and that are currently being monitored on a regular basis include the Aldabran Giant Tortoise (*Testudo elephantina*), nesting and immature Green Turtle (*Chelonia mydas*) and Hawksbill Turtle (*Eretmochelys imbricata*), White-throated Rail (*Dryolimnas cuvieri alabranus*), Coccid (*Icerya seychellarum*) and Coccinellid (*Rodolia chermesina*). Additionally, there is an on-going programme for subsistence fishing monitoring. The data and results from the long-term monitoring of fauna resources are typically presented annually in the SIF Research Officer's (RO) report. All of the data collected is kept on hard copy and on the Station computer. Back-up computerized data is sent to SIF.

Aldabra Giant Tortoise

Tortoise sub-population censuses are carried out on a monthly basis using a transect method for obtaining counts, as well as data on body dimensions and sex. There are 12 permanent transects in all. Both short-term and long-term changes in densities at different locations of the atoll may thus be detected over time.

Nesting and Immature Turtles

Monthly track counts are conducted along most beaches along the exterior and within the lagoon of Aldabra, while beaches in the vicinity of the Research Station are monitored more frequently. The data yields information not only on the number of turtles nesting on Aldabra, but also on seasonality and spatial distribution of nesting activity.

Adult female turtles are tagged in order to better understand behavioural aspects of the nesting turtle population. Though priority is given to track count work, monitoring staff is currently successfully tagging several hundreds of nesting turtles each year and obtaining data on previously tagged turtles returning to nest on Aldabra. Additionally, there is a tagging programme for immature turtles within the Aldabra lagoon.

White-Throated Rail

In the past, transect counts have been conducted on a monthly basis but are now carried out every two months. There are currently four rail transects on the atoll.

The frequency and methodology was changed in April 2001 in order to facilitate comparisons with original population estimates from surveys conducted in 1975 and 1976. The current methodology is the same as that used during surveys in the 1970's.

Coccids and Coccinellids

Monitoring of infestation levels of the accidentally introduced coccid, *Icerya seychellarum*, and the abundance of its biological control agent, *Rodolia chermesina*, is carried out on a seasonal basis (twice yearly). The method involves inspecting a set of pre-labelled trees or shrubs along a transect line and assigning each a level of infestation or abundance on a scale of 0 to 4.

Subsistence Fish Catch

Following each subsistence-fishing trip, monitoring staff record the number and weight of each fish species caught, along with data on fishing effort. The data is summarised monthly and forwarded to SIF and the Seychelles Fishing Authority every two months.

Additional Monitoring

Since the writing of the 1998 Management Plan, there have been further studies (some in collaboration with visiting scientists) added to the long-term monitoring program on Aldabra. This includes monthly monitoring by SIF staff of land bird and butterfly populations, and annual reef community surveys that are carried out by visiting marine scientists from overseas such as the Marine Programme conducted by the University of Cambridge UK.

Any unusual sightings (e.g. rare birds or cetaceans) of fauna are recorded as they occur and kept on file in the Station library. A record is also kept of any sightings of feral cats and goats.

There are several other short-term scientific studies that have been initiated by volunteers, visiting scientists and Station staff, but these will not be covered here.

Periodic monitoring of environmental parameters

Rainfall Monitoring

There are 13 rain gauges positioned around the atoll. Twelve of those are read and emptied on a monthly basis, while the Station rain gauge is read daily. Monthly total rainfall is presented in the RO report either on a monthly or bi-monthly basis.

Sea Temperature

In February 2001, 10 automatic temperature loggers were installed during a marine expedition led by visiting scientists forming part of the Aldabra Marine Program (AMP). The loggers were deployed at various depths inside the lagoon and along the reef slopes of Aldabra. Temperature data resulting from three of those loggers are being downloaded on a continual basis (every 1-2 months) by Station monitoring staff, while AMP visiting scientists will be checking the remaining loggers annually.

Air Temperature

Air temperature is recorded every morning at 08:00 on the Station. Manual readings are made from dry bulb, wet bulb, maximum and minimum thermometers. Temperature is also read by the automatic weather station.

Wind Speed and Direction

Wind speed and direction are recorded by the automatic weather station and transmitted to the meteorological office on Mahé. As a backup, station staff record wind speed and direction during the daily 08:00 weather reading.

Periodic monitoring of flora resources

Vegetation Surveys

Vegetation monitoring has been limited to a very small area of the atoll and carried out less frequently than that of fauna resources. Apart from recording the level of plant death in the trees and shrubs that form part of the biannual coccid transects described above, there are no other vegetation studies conducted by Station monitoring staff on a regular basis. Some of the transects set up by Gibson and Philipson (1983) were re-surveyed in 1988 by Scoones et al. and 1997 by ERGO. There has been no other vegetation monitoring since the 1997 survey.

Landscape monitoring

Beach Erosion/Accretion Study

Beach erosion and accretion is monitored twice per year, in the wet and dry season, along the beach in front of Aldabra Station. The method of assessing the relative level of accretion or erosion is by measuring the distance of the vegetation edge (currently defined as the beach edge) from fixed marker posts. Photographs of the beach are taken from the marker posts on each occasion. Additionally, photographs are taken of 22 popular turtle nesting beaches along the western shores of Aldabra.

Construction of buildings

All building construction and maintenance are monitored by the SIF site warden in liaison with the logistics manager. Repairs and maintenance are attended to by the SIF mechanic and assisted by labourers.

Key indicators for measuring the state of conservation

Although a number of monitoring systems are in place, data is collected and stored, in many cases for an extended period, a methodology has not been activated for periodic analysis which would provide a means of assessing the subtle changes in the ecosystem as they occur. Observation is the key indicator for measuring the state of conservation on the atoll. Methods of measuring the state of conservation are currently being examined and evaluated as part of the UNESCO/IUCN Enhancing World Heritage Sites Programme.

Monitoring Partners

Monitoring processes are outlined in the Aldabra management plan. Monitoring activities are carried out by SIF Rangers under the supervision of the Scientific Research Officer. All activities are coordinated by executive administrative staff and the SIF Scientific Sub Committee under the mandate of the SIF Board of Trustees. Together monitoring projects and practices are recommended and reviewed in line with the management plan.

Monitoring processes have evolved from those which were carried out by the Royal Society during their activities on the atoll, most of which are still in operation to date.

The World Heritage Committee or its Bureaus have not examined the state of conservation of the property first hand or made recommendations to the State Party in this respect.

II.7 CONCLUSIONS AND RECOMMENDED ACTIONS

a) Statement of significance/authenticity

The statement of significance has been updated and submitted within this report. The next update should draw more input from the wider scientific community.

b) Management of the property

1) Vallee de Mai

The property is managed by the SIF under the mandate of the SIF Board of Trustees. There is no formal agreement regarding the lease of the property to SIF. This issue will be pursued at Board of Trustee level.

The first 5-year management plan for the site is in production to be published late 2001.

Sufficient human and financial resources have been maintained to carry out day-to-day management at site level. Additional human resources would be beneficial to provide improved administration, coupled with greater financial resources, would provide more mobility for the implementation of progressive scientific activities. There is a great need for capacity building across the board.

Scientific research and the necessarily facilities to carry out studies is a major gap in operations at the property. Scientific studies are carried out mostly on an ad hoc basis by the government technicians and other visiting scientist. No computer facilities on site is another identified shortcoming.

Educational programmes are active with a reasonable amount of participation from school children despite the fact that there is no formal education policy directly relating to the site. The public at large are well informed of general conservation issues relating to the site via the Government, SIF, and the media. Some educational and publicity material is available.

The site is visual appealing with minimal development pressures or urbanisation. There are reasonable facilities in place to accommodate visitors and to supply information. Visitor numbers are steady. The biodiversity of the site has been well maintained with no significant changes or impending natural threats looming since its inscription as a World Heritage Site.

The threat of Coco de Mer poaching, the property's main resource, has increased marginally over the years and management is considering means of curbing these practices. The possibility of extending the reserves boundaries is currently being reviewed at national level.

2) Aldabra

The property is managed by the SIF under the mandate of the SIF Board of Trustees. There is no formal agreement regarding the lease of the property to SIF. This issue will be pursued at Board of Trustee level.

The current 7-year management plan expires in 2003. Reviews occur annual and revisions are schedule for 2002. There have been no changes in management and planning since inscription of the site.

Sufficient human and financial resources have been maintained to carry out day-to-day management at site level though some additional human resources would be beneficial to improve administration, coupled with greater financial resources would be beneficial for the implementation of progressive scientific activities. There is a great need for capacity building across the board.

Ongoing scientific studies have been conducted at the site since the 1970's and are carried out by SIF staff and visiting scientist. Limited research equipment exists in the way of laboratory facilities to carry out these studies. Computer equipment is available and a database holds monitoring data. GIS software has been installed and staff has been trained in its use. There is a research library on site, small zoological and herbarium collections.

Some educational activities in relation to the site take place and groups of school children visit the site annually. The public at large are well informed of general conservation issues relating to the site via the Government, SIF, and the media. Some educational and publicity material is available.

There are no significant threats to the property since its inscription, which is hindered by the lack of a permanent population on the atoll, small numbers of management staff, and the limited number of visitors. It remains a site rich in biodiversity with no clear impending threat with the exception of the repercussions of coral death as a result the world wide bleaching event which has affected the Western Indian Ocean to a large extent.

Animal poaching remains a threat though difficult to control and monitor due to the relatively large size and terrain of the atoll and the limited resources to thoroughly patrol the area.

c) Proposed future actions

1) Vallee de Mai

- i) Publish Management Plan
- ii) Extension of Reserve Boundaries
- iii) Long-term management and monitoring plan
- iv) Submission of cultural values assessment to UNESCO
- v) Implementation of capacity building programme
- vi) Installation of computer facilities on site
- vii) Increased scientific input and long term monitoring programmes
- viii) Improved ecotourism facilities
- ix) Improved educational awareness and public participation
- x) Pursuance of extended environmental protection measures

2) Aldabra

- i) Revisions to Management Plan
- ii) Long term management and monitoring plan
- iii) Installation of specialised software systems for monitoring
- iv) Improved sea transport on site
- v) Renovations and improvements to site infrastructure
- vi) Implementation of capacity building programme
- vii) Improved ecotourism facilities, i.e. parking lot and toilet facilities
- viii) Improved educational awareness
- ix) Increased scientific input
- x) Implementation of invasive species eradication programme

d) Responsible implementing agency

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Premier Building, Box 853,
Victoria,
Mahe,
Seychelles
Tel: +248 321-735
Fax: +248 324884
E-mail: sif@seychelles.net

e) Timetable for implementation

1. Vallee de Mai

- i** December 2001
- ii** Proposal pending
- iii** IUNC/UNESCO 4 year project July 2001 – July 2004
- iv** December 2001
- v** Funds dependent
- vi** 2002
- vii** On-going
- viii** 2002
- ix** ongoing
- x** 2002

2) Aldabra

- i** 2003
- ii** IUCN/UNESCO 4 year project July 2001 – July 2004
- iii** Funds dependent
- iv** 2001/2
- v** Funds dependent
- vi** Funds dependent
- vii** Funds dependent
- viii** On-going
- xi** On-going
- x** 2002 (Funds dependent)

f) Needs for international assistance

Substantial funds are needed for the implementation of a number of the proposed projects. A proposal for improving infrastructure, capacity building, and eco tourism facilities was produced in 2001, which would be reliant on UNESCO for alternative counterpart funding. The proposal has been submitted to a donor organisation and a response is awaited. Other donor organisations will be sought in 2002 though fundraising initiatives are hampered by limited personnel to conduct fundraising activities. The above-mentioned IUCN/UNESCO project promises some assistance in identifying potential donors. It is hoped that increased public awareness of SIF initiatives locally and internationally will attract interest in sponsorship of some of the proposed activities.

g) Resource persons or organisations

- The Ministry of Environment
Botanical Gardens,
Mont Fleuri
Seychelles

- The Seychelles Islands Foundation
PO Box 853,
Victoria.
Mahe
Seychelles

h) Inventory records and archives

Seychelles Islands Foundation
Angela Valente-Libanotis
Premier Building, Box 853,
Victoria,
Mahe,
Seychelles

II.8 Documentation enclosed

Maps and plans of the site layout
Illustrations of the state of conservation of the site (floppy disc & video cassette)
Details of important aspects “Focus on Aldabra”
Copy of the management plan for Aldabra
Indicative bibliography
Original Nomination document header page for Vallee de Mai

