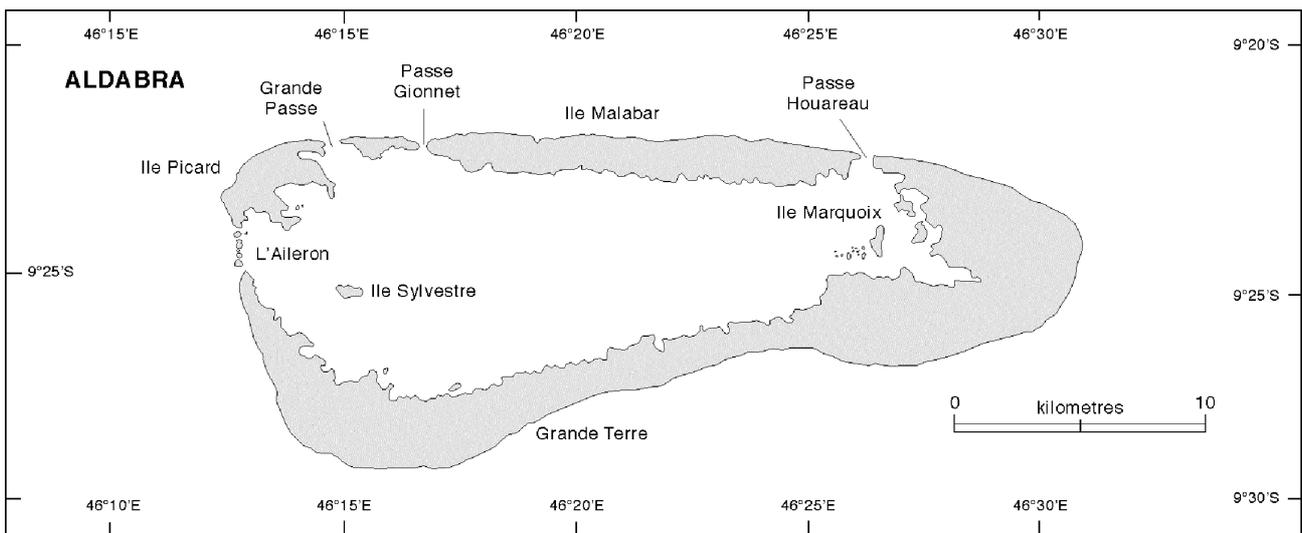


# Initial Assessment

Report of Initial Management Effectiveness Evaluation, September 2002

## ALDABRA ATOLL Seychelles



Prepared by Seychelles Islands Foundation

*Enhancing our*  
**HERITAGE**

monitoring and managing for success in natural world heritage sites

# CONTENTS

<b>INTRODUCTION</b> .....	<b>1</b>
<b>HOW THE EVALUATION WAS CARRIED OUT</b> .....	<b>4</b>
<b>CONTEXT REVIEW</b>	
<b>Focal Management Targets</b> .....	<b>6</b>
• Data sheet.....	8
<b>Threats to World Heritage Values and Focal Management Targets</b> .....	<b>11</b>
• Data sheet.....	13
<b>Review of National Context</b> .....	<b>16</b>
• Data sheet.....	18
<b>Engagement of stakeholders and partners</b> .....	<b>23</b>
• Data sheets.....	26
<b>PLANNING ASSESSMENT</b>	
<b>Management Planning Assessment</b> .....	<b>38</b>
• Data sheet.....	40
<b>Design Assessment</b> .....	<b>47</b>
• Data sheet.....	49
<b>INPUT ASSESSMENT</b>	
<b>Assessment of Management Needs</b> .....	<b>52</b>
• Data sheet.....	54
<b>PROCESS ASSESSMENT</b>	
<b>Rating System for Process Indicators</b> .....	<b>59</b>
• Data sheet.....	60
• Summary table.....	70
<b>OUTPUT ASSESSMENT</b>	
<b>Management Plan Implementation Database</b> .....	<b>71</b>
• Data sheet.....	73
<b>Work/Site Output Indicators</b> .....	<b>75</b>
• Data sheet.....	76
<b>OUTCOME ASSESSMENT</b>	
<b>Biodiversity Health Assessment</b> .....	<b>78</b>
• Data sheets.....	80
<b>Assessment of Threat Status</b> .....	<b>101</b>
• Data sheets.....	103
<b>Achievement of Management Objectives</b> .....	<b>111</b>
• Data sheets.....	112
<b>GAPS, RECOMMENDATIONS and CONCLUSIONS</b> .....	<b>116</b>

## INTRODUCTION

### **Aldabra atoll**

The Seychelles is an archipelago in the Western Indian Ocean, spread out within an Exclusive Economic Zone (EEZ) of 1.3 million km<sup>2</sup>. It consists of some 115 islands with a total land area of about 445 km<sup>2</sup>. The islands are of two types, granite islands in the northern portions and limestone islands in the southern portions. Out of a population of 80,000, 90% lives on the main granitic island of Mahé. Aldabra, which is a raised coral atoll in the south, has a land area of 155 km<sup>2</sup>, but together with the lagoon and the channels occupies a total area of 365 km<sup>2</sup>. The atoll measures 34km x 14.5km, and Mahé island would fit inside the lagoon of Aldabra. The distance between Mahé and Aldabra is over 1000km. (See maps)

Aldabra became a Special Reserve in 1981 and a World Heritage Site in 1982. It is a prime example of a raised coral atoll and is renowned for the following:

- Giant tortoises (about 100,000 – the largest population in the world)
- Relatively rich terrestrial biodiversity for an atoll, with a high proportion of endemics
- Diversity of marine habitats and rich marine biodiversity, especially fish
- Huge seabird colonies (red-footed booby and 2 species of frigate bird) and large numbers of shore birds
- Nesting green turtles and juvenile hawksbill turtles
- “Mushroom” islets of eroded limestone
- Relative lack of human disturbance (as there is no indigenous population)

Under current Seychelles legislation, ‘Special Reserve’ with respect to the Aldabra site is defined as “an area set aside, in which characteristic wildlife requires protection, and in which all other interests and activities are subordinated to this end.” It therefore fits IUCN Protected Area Category 1a. However, a limited amount of educational and nature-conservation oriented tourism is allowed, so that in effect it could perhaps be classified as Category 2.

Aldabra’s isolation, rough terrain and scarcity of fresh water have been primary factors deterring large human populations from settling. Although Aldabra forms part of a group of raised limestone islands and atolls (the Aldabra group), the other islands are either no longer inhabited or very sparsely so. On Aldabra there is a small resident population (about 10 people, mostly Seychellois and employed on contract terms), who are responsible for the day-to-day running of the World Heritage Site. There is a small Research Station and a varying number of visiting scientists.

### **Aldabra’s management**

The headquarters for Aldabra’s management agency (Seychelles Islands Foundation) is based on Mahé, 1000km away from Aldabra. This distance has profound consequences for management of the World Heritage Site.

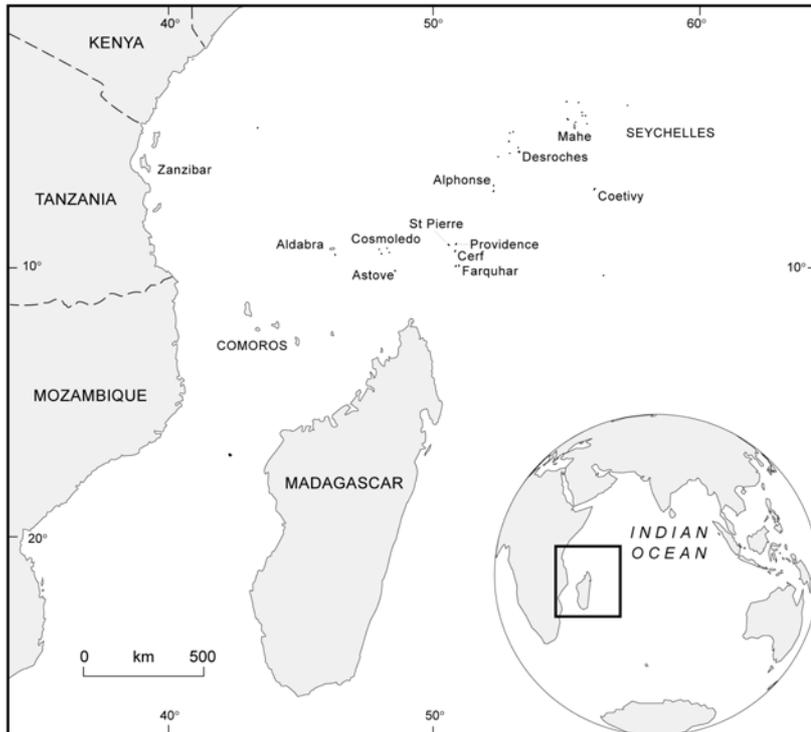
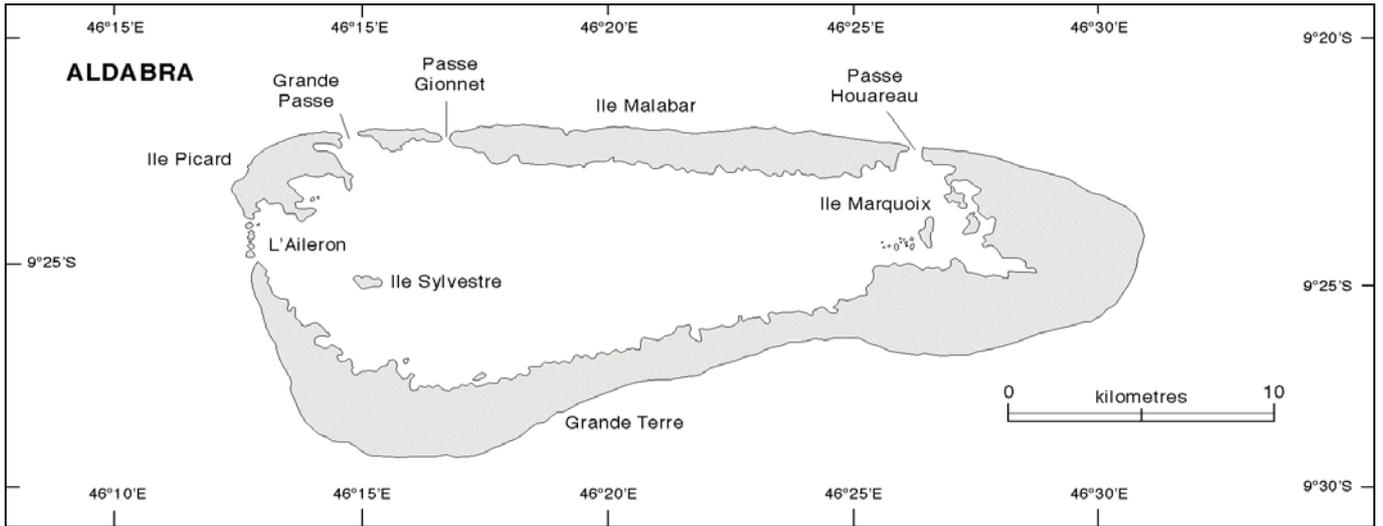
Seychelles Islands Foundation (SIF) was set up by Presidential Decree in 1979. Management consists of a government-appointed Board of Trustees with 14 members, of which members resident in Seychelles (currently 7 in number) form a Management Committee, which meets regularly throughout the year. All Board of Trustees members are requested to attend the Annual General Meeting. There is an executive staff of four people (all Seychellois). In addition there is a Scientific Sub-Committee, of currently 6 persons with biological/scientific and/or conservation expertise, which meets regularly to advise on any science and conservation issues. SIF is also responsible for the management of Seychelles’ other World Heritage Site, Vallée de Mai, on the granitic island of Praslin, famous for its Coco-de-mer palms.

This management structure has significant consequences for the management of Aldabra.

Funding for Aldabra atoll comes mainly from entrance fees to Vallée de Mai, but there is also a small government grant, and SIF raises others funds on its own. This unique arrangement between two World Heritage Sites, one of which is lucrative and one of which is running at a loss, also has consequences for management.

Over the last 22 years, Seychelles Islands Foundation has successfully managed the atoll, to preserve biodiversity and ecosystem processes on Aldabra in a good state. It has also achieved many of its management objectives for Aldabra (such as controlling feral goats), maintained long-term monitoring programmes, carried out research, and ensured a limited and controlled visitor education programme. To some extent the flexible, rather ad hoc approach to management has worked reasonably well, but many difficulties and inefficiencies remain, so that ensuring more effective management will surely enhance the value of the site.

As a result of Aldabra's rather unusual characteristics as a World Heritage Site, management may have rather different functions from other sites. Aldabra may need less interventionist management than some World Heritage Sites as it is already in a comparatively outstanding state, has no indigenous population, and natural processes are given priority. To a major extent management's focus needs to be caring for the atoll and protecting it, while at the same time ensuring that there are sufficient funds to run the site, conduct research and monitoring, provide protection from human interference and other threats, and if possible restore natural ecosystem functioning by removing alien species. It is noteworthy that the most significant threat to the atoll (global climate change) is out of management's control.



## HOW THE EVALUATION WAS CARRIED OUT

### The WHS evaluation process for Aldabra

#### Important features from the point of view of the WHS Management Effectiveness Evaluation:

- Aldabra is an entire ecosystem, isolated geographically from other land masses.
- There is no indigenous population in the area, unlike many other World Heritage Sites.
- The distance of Aldabra from HQ on Mahé makes communication difficult.
- The small staff available for the evaluation process made it necessary to use consultants, albeit ones linked with Seychelles Islands Foundation.

#### The assessment team

Focal person	SIF Executive Officer	= Chief assessors,
Main consultants	3 persons (all associated with Aldabra in some way)	compilers and writers of data tables
Other consultants	SIF Executive Director, Aldabra manager, Aldabra research officer	
Consultation also with all Aldabra staff + review by them		
Review by local Management Committee and Board of Trustees		
Review by some stakeholders (many did not turn up for the meeting)		

Note: Overall co-ordination and primary contact point was originally the Focal Person, who was the Executive Officer within Seychelles Islands Foundation.

The various sections of the management effectiveness framework were taken up as follows:

Context Review (4 units)	- KB and RG
Planning Assessment (2 units)	- AS (and KB)
Inputs Assessment (1 unit)	- AV
Process Assessment (1 unit)	- AV and KB
Outputs Assessment (2 units)	- AS and KB
Outcomes Assessment (3 units)	- RG and KB

The Final Report was originally going to be written jointly by KB and RG, but logistics made this difficult and KB took on the work.

#### Progress

The timeframe has been as follows:

August 2001	First meeting of Implementation Team
October 2001	Presentation on "Enhancing our Heritage" by Marc Hockings
October 2001	Commencement of Assessments
March 2002	Major meeting of Implementation Team
April 2002	Main Stakeholders Meeting
April 2002	Managers Workshop (linked to the AGM) + Aldabra staff workshop
April 2002	Marine scientists meeting
June 2002	Completion of main part of Initial Assessment
June 2002	"Enhancing our Heritage" meeting in Nairobi (linked to AfREA)
September 2002	Completion of draft Report

Many smaller meetings and consultations were held during the course of the evaluation, between the consultants and management personnel, consultants and workers, and between the consultants themselves. In general progress has been good, with good cooperation from most people, but the process has proved to be quite a challenge. Some of the difficulties are outlined below.

**Acceptance of the evaluation process**

The Evaluation has been welcomed as a process by all staff, both at HQ and on Aldabra, and by the local Management Committee and the Board of Trustees, as a valuable exercise and as a way to get an overview of management. It has helped to clarify important issues and will help with prioritizing actions in the future. Some important points arising from the evaluation have already been taken up. Stakeholders and Partners have been less interested (but note that there are relatively few) and it has been difficult to get some of them to come to meetings. This may reflect the fact that many people in Seychelles wear many hats, and the evaluation may have been seen as a less important issue from their point of view. (This is a familiar problem in Small Island Developing States (SIDS)) The important challenge now is to ensure that the evaluation is seen as part of a process, so that action is taken now to improve management of Aldabra, and re-evaluation is built into the management process.

**Notes on the layout of this Report**

For each of the six elements (and sub-sections of each) of the evaluation (Context, Planning, Inputs, Process, Outputs and Outcome) the assessment follows the outline below:

- Summary of the assessment
- Gaps and Recommendations
- Data tables
- Comments on use of the Workbook methodology

## CONTEXT REVIEW

### FOCAL MANAGEMENT TARGETS

#### **World Heritage Site Values**

Aldabra is listed as a World Heritage Site based on the following nomination:

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 a 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 where a number of important animal species and some plant species thrive, along with remarkable land formations, and its process provides a unique spectacle of natural phenomena.

Criterion iv Aldabra 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 last Giant Tortoise and flightless bird populations of the Western Indian Ocean, a substantial marine turtle breeding population, and large seabird colonies which number in the tens of thousands. The substantial tortoise population is self-sustaining and all the elements of its inter-relationship with the terrestrial environment are evident.

A recent report <sup>1</sup> has suggested minor adjustments to the above statements, including specific mention of Aldabra's exceptional marine ecosystem.

#### **Biodiversity Values**

It was noted that the key World Heritage values for Aldabra are listed under World Heritage criteria ii, iii and iv, relating to its natural beauty, significant biodiversity and on-going ecological processes, relatively free from human interference. As a result, the final list of focal management targets is dominated by Biodiversity Values. It has been realized for some time that terrestrial targets have been the main focus of research and monitoring (including those marine species that must come to land to breed). The result is a knowledge gap for the current status of marine and intertidal ecosystems around and within the atoll. This is brought out in the Information Gaps section below.

#### **Other Natural Values**

The inclusion of Other Natural Values in the Table raises the issue of Aldabra as a geological example of world significance. At the time of its inscription as a World Heritage Site, Aldabra was not listed under criterion i. It has been suggested <sup>2</sup> that this should be reconsidered on the basis of Aldabra's significance as a classic atoll formation and arguably the largest raised coral atoll in the world; also on the basis of its on-going geological processes and significant geomorphic features.

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<sup>1</sup> Seychelles Islands Foundation: "State Party Periodic Report 2001" for UNESCO. Page 16

<sup>2</sup> Seychelles Islands Foundation: "State Party Periodic Report 2001" for UNESCO. Page 17

### **Cultural and Social Values**

The value of Aldabra as a site for scientific research and monitoring has long been recognized. Its value for educational purposes, through strictly controlled nature conservation tourism, has also been part of management policy. It has been realized, as a result of this assessment exercise, that perhaps the cultural values of Aldabra have been neglected. Even though the relics of earlier settlement of the atoll are not significant in global terms, at a national level the history of human endeavours on Aldabra is worthy of more attention.

### **Overall management objectives** (taken from the Management Plan)

1. To preserve and protect the ecological integrity of Aldabra's terrestrial and marine ecosystems, including the flora and fauna, biological and genetic diversity, natural ecological and evolutionary processes, physical features, historical and cultural features, and scenic beauty.
2. To advance and facilitate the continuation of scientific research and environmental monitoring, with priority designated to the conservation, maintenance and restoration of the biological and genetic diversity of Aldabra's native species, their communities and ecosystems.
3. To ensure that the primary purpose of the limited tourism on Aldabra is conservation education, by means of accurate and entertaining interpretation of the natural and cultural features of the atoll.
4. To increase the environmental awareness of all staff on Aldabra, so that they can contribute actively to bringing about the three goals delineated above.

### **GAPS**

- **Marine ecosystems require significant research and monitoring to update information on their status (with the exception of coral reefs, which are already being studied).**
- **Atoll-wide terrestrial vegetation survey and monitoring is required.**
- **Intertidal systems require further analysis, and certain features need monitoring.**
- **Inland water pools need to be re-surveyed.**

### **RECOMMENDATIONS**

- **Ensure that the above gaps are filled within the next 10 years.**
- **Ensure that actions recommended in the management plan with respect to rehabilitation and/or maintenance of the remains of earlier human settlement on the atoll are taken up.**

Further details of proposals are presented in the Biodiversity Health Assessment.

## Focal Management Targets Data Sheet

	Focal Management Targets	World Heritage Values	Additional Attributes	Information on status
<b>Biodiversity Values</b>	Giant tortoise population	Largest population of giant tortoises in the world (approx. 100,000) <i>(criterion ii)</i>	A "Flagship" species and important indicator species for the state of the terrestrial environment. Links with a specialized vegetation type known as Tortoise Turf.	Yes
	Terrestrial habitats	Rich biological diversity:- Diversity of habitats / vegetation types for a remote atoll <i>(criterion iv)</i>	<i>Pemphis</i> scrub; Mixed scrub (open, closed & coastal); Tortoise turf; <i>Thespesia / Lumnitzera</i> ; <i>Sporobolus</i> grassland	Yes (needs updating)
		Relatively high proportion of endemic taxa <i>(criterion iv)</i>	Rare and threatened flora and fauna e.g. flightless rail, Aldabra lily	Yes (some need updating)

	<b>Focal Management Targets</b>	<b>World Heritage Values</b>	<b>Additional Attributes</b>	<b>Information on status</b>
	Coastal / intertidal habitats	Important feeding and breeding area for marine turtles, seabirds and shore-birds in the Indian Ocean <i>(criterion iv)</i>	Sandy beaches (green turtle); Mangrove (2 species of frigate bird, red-footed booby); Intertidal area in lagoon (significant populations of shorebirds e.g. crab plover); Lagoon islets (various terns and other seabirds)	Yes (some need updating)
	Aquatic habitats	Diversity of marine habitats within the large lagoon and around the atoll rim <i>(criterion iv)</i>	Coral reef and reef flats; Seagrass beds; Mudflats and sand flats; Atoll channels; (also mangroves)	Coral reef only?
		Breeding ground for many marine species in the Indian Ocean <i>(criterion iv)</i>	High fish diversity	Not recent (except some fish)
		Freshwater, brackish and marine pools are unusual and varied <i>(criterion iv)</i>	Flamingo; Ibis nesting sites	Not recent

	Focal Management Targets	World Heritage Values	Additional Attributes	Information on status
Other natural values	Classic raised coral atoll	Outstanding example of a large elevated coral atoll formation <i>(criterion iii)</i>	Geomorphology; Sequence and varied types of limestone	Yes
	Integrity	Relatively undisturbed atoll where ecological and biological processes are on-going and there is natural interaction between marine and terrestrial ecosystems <i>(criterion ii)</i>	A reptile (the Aldabra giant tortoise) is the dominant herbivore	Yes
Cultural / Social values	Relics of old human settlement		Buildings, cemetery and settlement history are nationally significant	Yes
	Site for scientific research		Opportunities:- Island / atoll ecology and evolution; Marine ecology and evolution; Geology; History of human settlement	Yes
	Site for education and for nature-conservation tourism		Opportunities:- Local; Commercial; Restoration	Yes

## CONTEXT REVIEW

# THREATS TO WORLD HERITAGE VALUES AND FOCAL MANAGEMENT TARGETS

### Current threats

There are two main stresses affecting the integrity of the natural ecosystems of Aldabra:

#### 1. Interruption to ecological processes

It is evident that climate change is having an impact on ecological processes on and around Aldabra. Although current weather data analysis does not support the perception of more severe dry periods, which would have most impact on terrestrial habitats, there is evidence of beach erosion and severe coral bleaching. These appear to be related to global climate change. Rising sea levels and extended dry seasons, however imperceptible, will affect the lagoon by further eroding coral islets and reducing vegetation available for tortoise food. It is possible that competition for food amongst tortoises may lead to loss of vegetation by overgrazing.

It may be difficult to mitigate the effects of climate change. Data collected on Aldabra could be used as a baseline for changes occurring elsewhere in the world.

#### 2. Disturbance to or loss of habitats, species and species integrity

This current stress is more obvious than the previous one. The change in species composition and loss of food resources due to alien species may be having an impact beyond those that are obvious to us. Alien species such as cats are predators of tortoise and turtle hatchlings. The coccid *Icerya seychellarum* has impacted certain plant species severely. Although goats have been considerably reduced in numbers, they still have an impact on the vegetation. Rats have an un-quantified impact on terrestrial species.

Dive boats, yachts and other visiting ships can damage coral with their anchors, although the risks have been minimized by placing mooring buoys in appropriate places. Poorly supervised visitors can have an impact through disturbance or even poaching. Poachers from outside the atoll can impact on fish and marine invertebrate populations. There is always a risk of fire or an oil spill from a tanker.

It is possible to reduce these threats by management action.

### Potential threats

These are threats which are on the horizon, that are impending but may not currently be taking place. Both current threats are included here because much of what is thought to be happening is based on assumptions.

#### 1. Interruption to ecological processes

If climate change is a reality, damage to all natural processes could be permanent. With the present knowledge it is not possible to predict exactly the changes that would occur on Aldabra but we can assume they would be severe. Examples of probable changes are sea level rise, an increase in extreme weather conditions, sea current changes, salination of the shallow soils, an increase in sea temperatures, further coral bleaching.

It may be difficult to mitigate the effects of climate change. Data collected on Aldabra could be used as a baseline for changes occurring elsewhere in the world.

2. Disturbance to or loss of habitats, ecosystems, species and species integrity

This potential stress could be caused by high tourism disturbance if the tourism policy were to be changed. Other sources include careless trail cutting, fire, oil pollution, poaching. Further unintentional alien species introduction could have severe impacts on all ecosystems, but the risk for terrestrial ecosystems is higher.

Management actions now and in the future could significantly reduce the threats.

3. Loss of cultural/social heritage due to fire, theft, cyclones, sea level rise

These threats could result in loss of buildings, graves, and records held in the library at the Research Station.

Management action could reduce certain of these threats.

### GAPS

- **Lack of information on the quantitative and qualitative impact of alien terrestrial species** (with the exception of feral goats and the coccid *Icerya seychellarum*)
- Lack of information on the effects of fire damage and recovery rates on Aldabra.

### RECOMMENDATIONS

Climate change resulting from global warming is largely out of management control and the effects are difficult to predict. Other threats can be predicted and the risks minimized by forward management, appropriate policies and contingency plans.

- **Policy on climate change in relation to Aldabra: A policy statement is required** if Aldabra is to be monitored as a natural site ('living laboratory') where climate change is allowed to have its full effects. Otherwise a policy statement should state to what extent management would go to mitigate the effects of climate change on the atoll.
- **Contingency plans for fire and oil spill should be enhanced.**
- **There should be additional specific proposals for minimizing the risk of introducing new alien species.**
- **Specific proposals are required for management action in the case of discovery of a new alien species on Aldabra.**
- **Specific proposals are required for dealing with armed poachers.**
- Additional specific proposals are required for management / restoration of cultural and social heritage on Aldabra.

## Identifying Stresses and Threats Worksheet

Threats to World Heritage Values	Key threat-related factor to be assessed	Focal Management Target affected	Attributes for consideration in status measurement
<b>Current Threats</b>	<b>Stress</b> Interruption to ecological processes	Stress to: All focal management targets and all WHS criteria	<ul style="list-style-type: none"> <li>• Severe coral bleaching and some beach erosion occurring now.</li> <li>• Possible loss of beaches, islets and coastal areas within 10 years.</li> <li>• Possible loss of flora and fragile taxa due to extended dry periods.</li> </ul>
	<b>Source</b> Climate change		Source is the major contributor
	<b>Stress</b> Disturbance to, or loss of, habitats, ecosystems, species or species integrity	Stress to: All focal management targets and WHS criteria ii and iv	<ul style="list-style-type: none"> <li>• Habitat loss due to alien flora.</li> <li>• Competition for food resources.</li> <li>• Predation by cats and rats.</li> <li>• Loss of endemic taxa.</li> <li>• Change in species composition.</li> <li>• Loss of food resources.</li> <li>• Possible loss of fragile taxa due to oil deposits.</li> </ul>
	<b>Source</b> Alien species		Source assumed to have impact but few quantitative studies available.
	<b>Source</b> Tanker oil spill		No oil spills have occurred but the risk is there. Damage would depend on the circumstances of the oil spill.

Threats to World Heritage Values	Key threat-related factor to be assessed	Focal Management Target affected	Attributes for consideration in status measurement
	<b>Stress</b> Damage to, and disturbance of, habitats	Stress to: All focal management targets and WHS criteria ii and iv	<ul style="list-style-type: none"> <li>Anchor damage to coral.</li> <li>Minor poaching of various marine and terrestrial species.</li> </ul> Note that effects tend to be localized and not severe.
	<b>Source</b> Human disturbance, e.g. dive boats and yachts, poorly supervised visitors, poaching		Source is main contributor
<b>Potential Threats</b>	<b>Stress</b> Interruption to ecological processes	Stress to: All focal management targets and WHS criteria	<ul style="list-style-type: none"> <li>Possible sea level rise and weather changes could have severe effects.</li> <li>It is difficult to assess the impacts with current knowledge.</li> <li>Damage to ecological processes may be permanent.</li> </ul>
	<b>Source</b> Climate change		Source would be main contributor
	<b>Stress</b> Disturbance to, or loss of, habitats, ecosystems, species or species integrity	Stress to: All focal management targets and WHS criteria ii and iv	<ul style="list-style-type: none"> <li>Possible damage to habitats and species composition.</li> <li>Possible loss of fragile taxa.</li> <li>Damage unlikely to be permanent if management action is taken now.</li> </ul>

Threats to World Heritage Values	Key threat-related factor to be assessed	Focal Management Target affected	Attributes for consideration in status measurement
	<p><b>Source</b> New alien species</p>		<ul style="list-style-type: none"> <li>• Habitat loss caused by alien flora.</li> <li>• Loss of endemic taxa due to competition or disease.</li> <li>• Change in species composition.</li> <li>• Competition for, or loss of, food resources.</li> </ul>
	<p><b>Source</b> High tourism disturbance, trail cutting, poaching, fire or oil pollution</p>		<ul style="list-style-type: none"> <li>• Effects would depend on the severity and extent of disturbance.</li> <li>• Damage could be limited by management action.</li> </ul>

## CONTEXT REVIEW

### REVIEW OF NATIONAL CONTEXT

Seychelles has a good environment conservation reputation. Approximately 46% of Seychelles land area is set-aside as Protected Area (just under 20,000 hectares). In addition, there is 23,000 hectares of protected coral reef and other marine habitats. These Protected Areas include 4 Special Reserves (of which Aldabra is one), 7 National Parks (of which 4 are marine), 9 Nature Reserves, 4 Shell Reserves and 2 protected areas.

#### **Legislation**

The problem of enforcement of legislation is a countrywide problem and measures to improve the situation are already being taken up by the Ministry of Environment. New environmental laws are being drafted, which will help to bring together the currently fragmented legislation. At the moment illegal actions on Aldabra are relatively few and far between, but international poaching could become a serious problem in the future as boats become better equipped with satellite navigation, and if fish stocks are depleted and regional countries are unable to significantly improve their economic situation. Some kind of regional cooperation could help to reduce the risks.

As mentioned in the Stakeholder and Partner Engagement assessment, there is a need perhaps to question whether the setting up of the Seychelles Islands Foundation by legal decree is now the most appropriate form of management for Aldabra atoll. (Note that it is possible to introduce amendments to the Seychelles Islands Foundation Decree, should they prove necessary.)

#### **Broad government policy**

As shown in the table below, Seychelles has signed numerous international conservation conventions, and also other agreements regarding marine pollution, fisheries and climate change. There is much regional cooperation on environmental issues and Seychelles is active on the global environment scene.

The Environment Management Plan of Seychelles (EMPS) 2000-2010 is a major instrument in the planning and management of the whole of the Seychelles environment. Sustainable development is the overall goal of the EMPS. Aldabra comes under the Support Programme for Outer Islands Biodiversity, which includes other islands in the Aldabra group. There may be options for giving broader protection to some of these outer islands.

#### **Government support**

There is much support for the site, as detailed in the table on the next page. The Ministry of Environment is in effect overseeing most national protected areas (or can influence decisions through Board membership), even though it may not have direct influence over Protected Areas that are managed by independent agencies.

#### **Non-government support**

There is some support from non-government agencies, private sector, NGOs and civil society, mainly through the contributions of individuals who serve on Seychelles Islands Foundation committees and through financial contributions.

## **GAPS**

- **Absence of enforcement capability for international poaching on Aldabra.**
- **Tourism policy needs to be reviewed.**

## **RECOMMENDATIONS**

- **There is a need to reassess the balance between government support/control and non-government support/control** (i.e. overseas institutions, private sector, NGOs and civil society).

## Review of National Context: Data Sheet

Criteria	Strengths	Weaknesses
World Heritage Site and protected area legislation	<p>Legislation protecting Aldabra is adequate (Aldabra is designated as a Special Reserve - Order S/I 86/1981 - for which there are Aldabra Special Reserve Regulations - S/I 87/1981).</p> <p>In addition, there is a plethora of government legislation on various aspects of the environment.</p> <p>SIF was set up by decree (Seychelles Island Foundation Decree - Chapter 217) as a corporate body to manage and conserve the natural life of Aldabra and to initiate and control scientific research into such natural life (thus enabling the major WHS criteria to be fulfilled).</p>	<p>There is actually no lease paper for Aldabra - there is only an informal lease arrangement (this issue is currently being addressed) (=GAP).</p> <p>Regulations have not been consistently enforced for all staff and visitors.</p> <p>Legislation pertaining to biodiversity and other aspects of environmental protection is extremely fragmented. Enforcement of much biodiversity legislation has been historically weak (= NATIONAL PROBLEM). Enforcement capability by the coastguard and police, with respect to Aldabra, is weak. Aldabra staff are concerned about their inability to deal with illegal fishing or vessels coming within the exclusion zone (=PROBLEM).</p> <p>The enforcement mechanism for international poaching on Aldabra is extremely limited (= GAP).</p>
Conservation within broader government policy	<p>There is a Ministry of Environment, headed by a Government Minister, with a Permanent Secretary, a Director General, and with several major subdivisions, each headed by a Director.</p> <p>The government has prepared a second Environment Management Plan of Seychelles (EMPS) for the period 2000-2010, which serves to guide policy and action with respect to the</p>	<p>There is a slight danger that the government's tourism policy will encourage the move to make Aldabra an eco-tourism destination (as opposed to having a strictly regulated visitor policy). Eco-tourism development is seen as part of sustainable tourism development (see "Vision 21", the government's strategic vision of tourism development).</p> <p>Note that there is still no <u>well-defined</u> policy</p>

Criteria	Strengths	Weaknesses
	<p>management of the environment. The emphasis is on sustainable development in Seychelles and it encompasses all major and emerging environmental issues. (The previous EMPS covered the period 1990-2000.)</p>	<p>regarding nature-conservation based tourism on Aldabra (=GAP).</p>
<p>International conservation conventions and treaties</p>	<p>Seychelles was instrumental in setting up the Indian Ocean Marine Mammal Sanctuary in the early 80s. Seychelles has also ratified several international conventions of significance to Aldabra:</p> <ul style="list-style-type: none"> <li>• Convention on Biological Diversity (CBD) (1994) (<i>Seychelles is currently implementing a National Biodiversity Strategy and Action Plan</i>).</li> <li>• Convention on International Trade in Endangered Species (CITES)(1973) (<i>This is generally complied with</i>).</li> <li>• African Convention on the Conservation of Nature and Natural Resources (1968)</li> <li>• Nairobi Convention for the Protection of the Marine Coastal Environment of the Eastern African Region (1985) (<i>Seychelles hosts the regional coordinating unit</i>)</li> <li>• Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972)</li> </ul>	<p>Ramsar (Convention on Wetlands) has not yet been ratified. (<i>Note that Aldabra has extensive mangrove areas, a variety of freshwater and brackish water pools and many marine shallow water habitats, which are included in the Ramsar definition of wetlands.</i>) The Convention on Migratory Species has also not been signed. However, the reason that the government has not signed such conventions has more to do with financial constraints than a lack of commitment.</p>

Criteria	Strengths	Weaknesses
	<ul style="list-style-type: none"> <li>• Convention for the Prevention of Pollution from Ships (MARPOL)(1973/78)</li> <li>• Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)</li> <li>• Framework Convention on Climate Change (1992) (<i>Seychelles has submitted its first national communication to the Conference of Parties</i>)</li> <li>• Seychelles is participating in ICRAN/ICRI and CORDIO programmes relating to coral reefs.</li> </ul>	
<p>Government support for the World Heritage Site</p>	<p>Government's commitment to Aldabra as a WHS is strong. The President is designated as the patron of SIF in the Decree. The Chairman of the local management board is currently the PS of the Ministry of Environment; several government officials also sit on this board. IDC (Islands Development Company), which is a quasi government organization (parastatal) responsible for other outer islands of Seychelles, is the main transporter of goods to Aldabra.</p> <p>The Government gives an annual donation of SR100,000 to SIF. All proceeds from Vallée de Mai entrance fees are retained by SIF (rather</p>	<p>Government has very much influence on what happens within SIF, even though there is an increasing input from non-governmental organisations. National civil society has little opportunity to influence decisions. Government support may be influenced by politics - (?= PROBLEM e.g. would a change of government change the commitment to Aldabra as a World Heritage Site?).</p> <p>SIF is a quasi NGO: all board members have to be appointed by the President, no members are elected, (?= PROBLEM?). (However, there is a process whereby appropriate choices are made in accordance with the Decree, and it has been adapted in recent years to</p>

Criteria	Strengths	Weaknesses
	<p>than going into general government revenue). SIF gets tax-free fuel for Aldabra. There is currently a total waiver of trade tax on necessary imports for Aldabra. Government allows 100% tax rebate on all donations from the private sector and other local taxpayers. There is now some exchange of rangers between, the Ministry of Environment, other Government organizations and SIF.</p>	<p>reflect the changing balance.)</p> <p>IDC boat and plane schedules to the outer islands often change, and Aldabra has to fit in with these, which can be very awkward for research scientists on a tight schedule (= RECOGNISED PROBLEM). There is potential for greater co-operation from IDC.</p>
<p>National protected area agency and the World Heritage Site + SIF and the World Heritage Site</p>	<p>Note that there is no national protected area agency in Seychelles - different PAs are managed by different agencies, e.g. Ministry of Environment, Marine Parks Authority, Birdlife Seychelles. This allows for a concentration of finance, expertise and effort into specific PAs. It also allows for a certain amount of necessary independence and diversity of approaches.</p> <p>Aldabra is managed by a specially established agency (SIF). The only other site managed by SIF is Vallée de Mai (which is a much smaller World Heritage Site).</p> <p>Approximately 80% of the SIF budget goes to field operations on Aldabra.</p>	<p>The Ministry of Environment has a vast mandate, and stretched resources and technical expertise. To take on the "umbrella" role of national agency would require extra funding and personnel.</p> <p>Although SIF only manages two sites, Aldabra is too reliant on Vallée de Mai entrance fees for revenue (= RECOGNISED PROBLEM).</p> <p>Distance between HQ and Aldabra continues to be a difficulty in terms of supplies, personnel problems, emergencies, etc. Although much improved in recent years, communication links are expensive and</p>

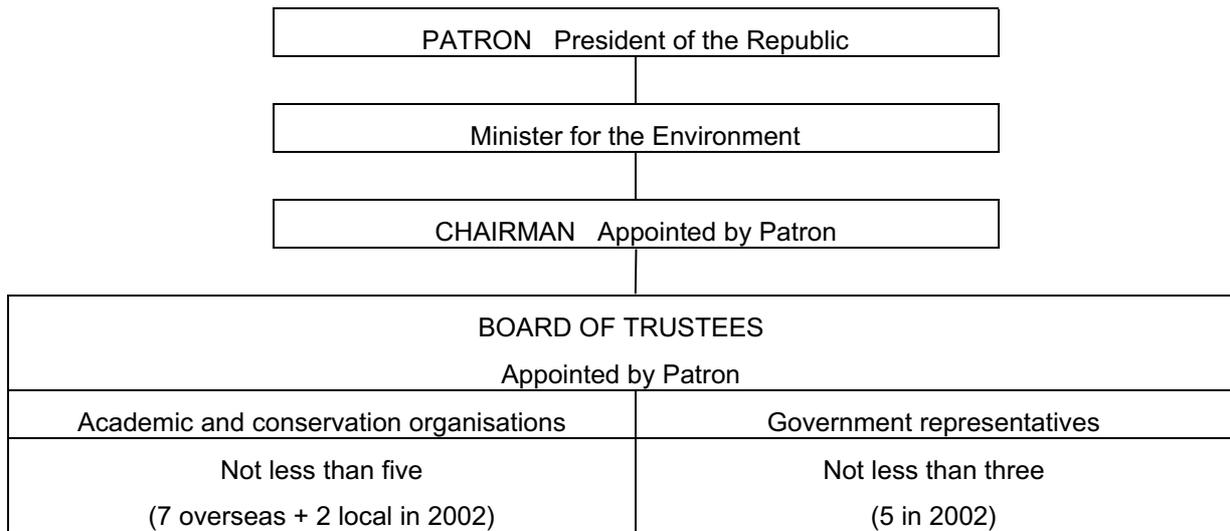
Criteria	Strengths	Weaknesses
	<p>SIF staff visit Aldabra usually once or twice a year. There is regular communication between SIF HQ and Aldabra through telephone, fax, email or radiotelephone links.</p>	<p>sometimes break down, causing delays and frustrations (= RECOGNISED PROBLEM).</p> <p>Constraints (see other sections of this assessment) within SIF and outside of SIF have resulted in:- too much time spent on day-to-day running, and sorting out problems resulting from Aldabra's distance from Mahe; less research being carried out than desirable; and a tendency for coping strategies to predominate rather than being able to plan well for the future (= PROBLEM).</p>

## CONTEXT REVIEW

### ENGAGEMENT OF STAKEHOLDERS AND PARTNERS

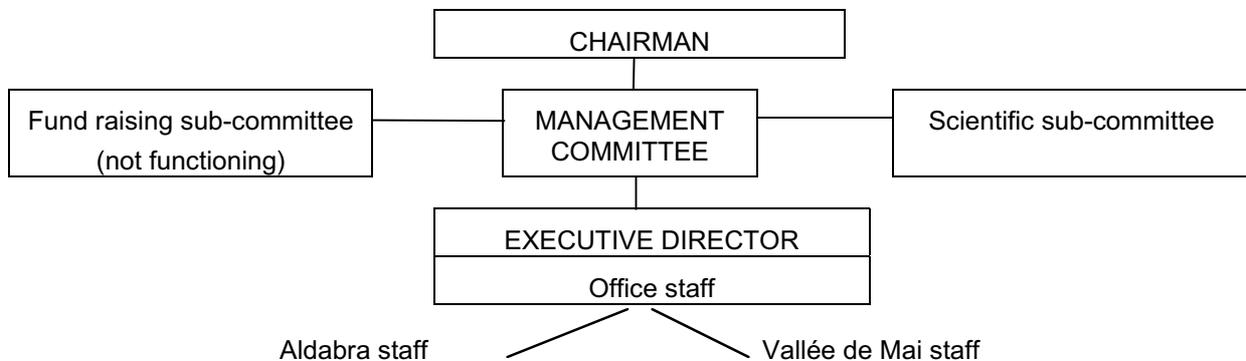
#### SIF Administrative Management Structure

There is an issue surrounding the management of Aldabra, which concerns its status, structure and the makeup of its management body. Seychelles Islands Foundation was established by Presidential Decree in 1979 as a body corporate to manage and conserve the natural life of Aldabra and to initiate and control scientific research into such natural life. Under the decree, the Seychelles Islands Foundation operates under the mandate of a 14 member Board of Trustees. The management structure is as follows:



This structure has sometimes been misconstrued to mean that the Board of Trustees is numerically biased towards non-governmental organizations. As a result, SIF is often seen as an NGO. But it clearly is not, as it was set up by presidential decree, and the Board members are appointed by the President/Patron. Also, an academic institution is not an NGO in the usual sense of the term.

For the day-to-day running of SIF affairs, the structure below was established. The Management Committee consists of all Board of Trustee members who are resident in Seychelles. Meetings are held at least once a month. Decisions at these meetings are carried out by the Executive Director of SIF and his small number of support staff, consisting of an Executive Officer, Assistant Executive Officer and Administrative Assistant.



The Management Committee thus becomes the main management body for SIF and Aldabra. Of the members of this committee (including the Chairman), 5 are government employees and 2 represent

local NGOs, giving a distinct bias perhaps towards government interests (one government member of the Committee has just retired and will need replacing).

It is difficult therefore to separate Government interests as part of the management body and Government interests as a stakeholder and partner. Consequently the question arises as to whether SIF being managed by a Board of Trustees is actually the most appropriate structure for management, given the changed circumstances of Aldabra (which subsequently became a World Heritage Site), and the current nature of world Protected Area management. However, it is the Government which owns Aldabra and there has been no formal agreement for lease of the atoll to SIF in terms of management. In the international context, if the legal status proves to be an impediment, then perhaps it could be changed.

The dilemma has arisen because of historical circumstances (the Decree is dated 1979). There has been a government-dominated approach to conservation until quite recently. Lack of broad stakeholder involvement could be due to the isolation and remoteness of Aldabra, so that management has been left in the hands of a few, but it could also be that the formation and composition of SIF has deterred participation. A more participatory approach may be required.

In recent years SIF has made some changes in the management structure because of the increasing complexity of managing a World Heritage Site. Formerly there was only an Executive Officer and two support staff. Currently there is an Executive Director as well as the Executive Officer. In addition, the composition of the Board of Trustees has been partially adjusted to reflect the increasing role of NGOs.

If the current structure is retained, there are some questions to be debated: Are there sufficient “checks and balances” within the structure to enable Aldabra to be run as a relatively independent protected area? Is direct Government involvement in fact a very necessary part of the support structure for the management of Aldabra, particularly as it owns the atoll? Should the Executive Director be given more power to manage the atoll directly, with the Board of Trustees as advisors?

#### **NGO involvement**

It should be noted that many (but by no means all) people active in local NGOs are also Government employees. This may be an inevitable consequence of the small population of Seychelles, and the limited number of qualified personnel in the environment field. NGOs were unable to operate for fifteen years or so, becoming active again only in the 1990s. Funding, projects, and programmes to do with the environment, have been dominated by Government until recently. An increasing number of projects are now being initiated by NGOs as participation in this type of activity becomes more established. There is also considerable room for private sector participation in conservation initiatives.

SIF should tap into these non-governmental links as much as possible.

#### **Civil society**

The point has been raised that Civil Society has little or no impact in the management of Aldabra, and yet the population of Seychelles is becoming increasingly aware of its importance in the archipelago. Although the Seychellois were the people to exploit in a limited way the resources of Aldabra in the 19<sup>th</sup> and 20<sup>th</sup> centuries, the atoll is now recognized as being a very significant part of their natural heritage. Some people still see Aldabra as a place to be exploited – particularly for its fish and turtles. Others wish to be able to visit the remote atoll because they feel that as citizens, they should be allowed to do so. At the moment it is difficult to accurately gauge the attitude of the general public towards Aldabra in terms of participation. Nevertheless, local views will have to be addressed by Management, and some kind of policy developed with respect to Seychellois visitation. Note that this issue links with the possibility of connecting the islands of the Aldabra group in such a way that one or two of the other three islands/atolls of the group could be rehabilitated to some extent, leaving Aldabra itself off limits to major tourism (as is done in the Great Barrier Reef World Heritage Site).

### **Overseas institutions**

At the moment, opportunities for these organizations to contribute to SIF tend to be linked with membership of the Board of Trustees or to a specific research programme on Aldabra. It would be worthwhile for SIF to look into ways for an increased number of overseas organizations to make a positive contribution.

### **Tourism operators and Shipping agents**

It has been suggested that tourism operators are, in fact, interested in the management of Aldabra, even though there are few ways for them to be involved at the moment. Perhaps it would be appropriate for SIF to invite those who are interested to talk about future possibilities for involvement with Aldabra, as this could lead to partnerships (as is the case with one of the live-aboard boats that visits Aldabra). It does not have to lead to excessive tourism, especially if there is a clear policy.

### **Private Sector**

This is perhaps an increasingly important group that should be considered to include potential partners or stakeholders.

## **RECOMMENDATIONS**

- **Review the form of management structure that exists for Aldabra.**
- **Increase opportunities for stakeholder participation in the functioning of the site** (including overseas institutions, tourism operators, private sector, NGOs, civil society).

## Engagement of “Stakeholders” and “Partners in Management” Worksheet 1

**Target/Management Objectives:** All biodiversity targets (giant tortoises, terrestrial habitats, coastal and intertidal habitats, aquatic habitats), other natural values (classic raised atoll, integrity) and site for scientific research.

	Factor	Overseas Institutions	Tourism Operators / Shipping Agents	Government Ministries and Organisations	Non-Governmental Organisations	IDC Island Development Company
<b>Understanding Stakeholders</b>	<b>Economic dependency</b>	None	Low/Medium; depends on what proportion of visitors go to Aldabra as the main attraction	None, or only indirect through Aldabra's prestige value	None	Low. SIF pays for each 2-monthly supply trip, but IDC has to serve the other islands anyway.
	<b>Impacts (Negative Impacts on Environment)</b>	Low; research activities can have a negative impact on biodiversity targets, (but note that all research projects need prior assessment as to their impact before approval)	Low if visits controlled + guides + zoning policies followed; but anchor damage in aquatic habitats; also occasional unauthorized trips into out-of-bounds zones, including for fishing	Low at present (e.g. occasional poaching); potential for habitat damage if tourism development is pushed too far (and e.g. emergency airstrip on the atoll)	None	Low, e.g. occasional poaching/fishing incidents

	Factor	Overseas Institutions	Tourism Operators / Shipping Agents	Government Ministries and Organisations	Non-Governmental Organisations	IDC Island Development Company
	<b>Impacts (Positive Contribution)</b>	Medium; provide advice, links and contacts (and sometimes funds), especially for research, up-to-date methodology and equipment. Can give a broader perspective on some issues. Potential for greater contribution (e.g. more institutions to get involved).	Low-Medium; bring visitors to Aldabra and therefore money and increased overseas interest, but currently at a low level and seasonal	Very high - through environmental policies, financial assistance; several ministries have representatives on the local management board and SIF committees; some exchange of rangers in government service	Low-Medium but increasing; potential exchange of rangers between SIF and other NGOs, potential for further exchange of ideas	High: IDC transports all essential supplies, and staff, to Aldabra; help with emergency evacuation etc. from Assumption, which is an IDC administered island; transport for special visitors (and basic catering if there is a long wait); positive response to request to eliminate domestic pigeons on Assumption.

	<b>Factor</b>	<b>Overseas Institutions</b>	<b>Tourism Operators / Shipping Agents</b>	<b>Government Ministries and Organisations</b>	<b>Non-Governmental Organisations</b>	<b>IDC Island Development Company</b>
	<b>Willingness to engage</b>	Medium-High for those on the Board of Trustees; maybe more would make a contribution if there was more publicity and easier access to the atoll	Low but potentially Medium	Very high; Aldabra is "the jewel in the crown"	High-Very High depending on the organization; two or three have representatives on SIF committees; willingness to engage in research	Medium; there is a willingness on the outer islands to help each other because of the isolation; Assumption also benefits from increased contact with Mahé
	<b>Political / Social Influence</b>	High; promotion of research potential - prestigious institutions can have big influence on Government, SIF and other institutions	Low; foreign shipping agents have influence on tourist numbers to some extent, which can affect SIF revenue	Very High but sometimes too much influence on SIF as an independent body; local media (through films and programs) can influence general public	Low at present, but growing	High; political influence; IDC also has potential to make or break the supply line to Aldabra

	Factor	Overseas Institutions	Tourism Operators / Shipping Agents	Government Ministries and Organisations	Non-Governmental Organisations	IDC Island Development Company
	<b>Organisation of Stakeholders</b>	Low; but potential links if there is a reason	Low; local and foreign TOs and SAs tend to be in competition	High; there is liaison between ministries and bodies to a varied extent	Medium; LUNGOS is an umbrella organization for NGOs but of varying effectiveness	It is a Government Parastatal Organisation
<b>Assessment of Stake-holder Engagement</b>	<b>What opportunities do stakeholders have to contribute to management?</b>	Low; only those that are associated with the Board of Trustees, who get sent minutes of all SIF meetings. More thought needs to be given to alternative opportunities.	None at present (except indirectly through one member of the local management board and one member of the science sub-committee)	Very High; several representatives on SIF local Management Board, etc. Perhaps some bodies should have more representation? (e.g. Coastguard)	Low; few opportunities at the moment except through individual reps associated with SIF; potential for more involvement	High but only indirectly through command of supply boat, plane, etc. which can have an effect on management decisions;

	Factor	Overseas Institutions	Tourism Operators / Shipping Agents	Government Ministries and Organisations	Non-Governmental Organisations	IDC Island Development Company
	What is the level of engagement of the stakeholder?	Medium; some engage relatively little except for Annual General Meeting; others are quite involved (e.g. Aldabra Marine Programme and other scientific work); potential for more involvement	Low; occasional assistance with transport, etc. Potential for re-direction of interest for the benefit of Aldabra	High; some sections perhaps too high, so that the overall balance of influence in local management is too one-sided (e.g. 5 government employees on the local Management Committee compared with 2 NGO reps.	Medium; could be higher - more opportunities needed, but are beginning to happen	Medium; mainly every two months with the supply boat, and at irregular intervals with the plane
Summary	Overall adequacy of stakeholder engagement (Very good, Good, Fair, Poor)	Fair/Good	Poor/Fair (adequate for the current level of tourism)	Very Good	Good (at least for some) Note that there is little "civil society" input (except through NGOs, which is limited to a few people)	Good

## Engagement of “Stakeholders” and “Partners in Management” Worksheet 2

Target/Management Objective: Site for Education and Nature-Conservation Tourism

	Factor	Overseas Institutions	Tourism Operators / Shipping Agents	Government Ministries and Organisations	Non-Governmental Organisations	IDC Island Development Company
<b>Understanding Stakeholders</b>	<b>Economic dependency</b>	None	Low/Medium; depends on what proportion of visitors go to Aldabra as the main attraction	None	None	Low
	<b>Impacts (Negative Impacts)</b>	None	Low; they can choose not to visit Aldabra, so reducing incoming funds to SIF; too many visitors at once (e.g. cruise ship) can put strain on staff resources	Low	None	Low but potentially high; if costs for transport increase, it could have a significant economic impact on SIF for educational trips

	Factor	Overseas Institutions	Tourism Operators / Shipping Agents	Government Ministries and Organisations	Non-Governmental Organisations	IDC Island Development Company
	<b>Impacts (Positive Contribution)</b>	Low; but they can help to "spread the word", especially media organizations that visit for filming; could get more involved, e.g. training for staff, funding for education projects	Medium; most tourists are special-interest groups; their own staff can help with guiding in some cases; some accommodation for school groups; could provide training and experience for potential guides amongst SIF staff	High; emphasis on environmental education in schools. Visit to Aldabra is a prize for certain activities / groups; IDC helps with transport for educational trips	Low; but various NGOs are interested in educational possibilities on Aldabra	Medium; occasional help with visitor travel by plane, for which IDC allows a 50% discount on the charter fee

	<b>Factor</b>	<b>Overseas Institutions</b>	<b>Tourism Operators / Shipping Agents</b>	<b>Government Ministries and Organisations</b>	<b>Non-Governmental Organisations</b>	<b>IDC Island Development Company</b>
	<b>Willingness to engage</b>	Low; (overseas board members only) education and tourism usually are not high on their agenda, (but note that they may not have been approached)	Medium; some cruise ships use their own staff to assist with educational aspects of the visit, or locate local experts to accompany the trips	High; good co-operation from Min. of Education	High; much interest; there is potential for further support from them and perhaps a pool of future workers from amongst members	Medium; usually good cooperation with transport arrangements
	<b>Political / Social Influence</b>	Low; but could be higher if SIF policies changed significantly, e.g. tourism, sale of tortoises	Medium; could influence the educational content of trips to Aldabra; or could push for more trips	Very High; note that government could influence SIF to develop eco-tourism in order to promote greater financial independence	Low-Medium but increasing	High; because of control of much of the transport to Aldabra

	Factor	Overseas Institutions	Tourism Operators / Shipping Agents	Government Ministries and Organisations	Non-Governmental Organisations	IDC Island Development Company
	<b>Organisation of stakeholders</b>	None; but there could be links between them for a particular objective	Low	High; Environment Education Co-ordinating Committee; STAB; inter-ministerial committees	Medium; could be more interaction between NGOs through LUNGOS, the umbrella organisation	It is a Government Parastatal Organisation
<b>Assessment of Stakeholder Engagement</b>	<b>What opportunities do stakeholders have to contribute to management?</b>	Low; Only members of the Board of Trustees	Low; through SIF committee membership; cruise ships only indirectly (and for specific trips)	Very High; through reps on local management board (at least for some Ministries and Organisations)	Medium; mostly through individuals who are reps on SIF committees	Medium; but only indirectly through transport arrangements, which can have an impact on management decisions
	<b>What is the level of engagement of the stakeholder?</b>	Low, except for some Board Members	Medium, but only a small number	Very high (Proportionally too high?)	Medium for certain NGOs and individuals	High, although indirectly

	<b>Factor</b>	<b>Overseas Institutions</b>	<b>Tourism Operators / Shipping Agents</b>	<b>Government Ministries and Organisations</b>	<b>Non-Governmental Organisations</b>	<b>IDC Island Development Company</b>
<b>Summary</b>	<b>Overall adequacy of stakeholder engagement</b> (Very good, Good, Fair, Poor)	<b>Poor/Fair</b> (because not currently involved in this aspect of Aldabra)	<b>Fair</b> (adequate)	<b>Very Good</b>	<b>Fair</b> Note that there is little "civil society" input (except through NGOs, which is limited to a few people)	<b>Fair/Good</b>

### Stakeholder Engagement Summary Table

<b>Focal Management Target / Management Objective</b>	<b>Overseas Institutions</b>	<b>Tourism Operators / Shipping Agents</b>	<b>Government Ministries and Organisations</b>	<b>Non-Governmental Organisations</b>	<b>IDC Island Development Company</b>	<b>Overall Stakeholder Engagement for Target / Objective</b>
Biodiversity and research targets and objectives	Fair/Good	Poor/Fair (adequate)	Very good	Good	Good	Good
Site for education / tourism	Poor/Fair	Fair (adequate)	Very good	Fair	Fair/Good	Fair
<b>Overall Engagement of the stakeholder</b>	<b>Fair/Good</b>	<b>Fair</b>	<b>Very good</b>	<b>Fair/Good</b>	<b>Good</b>	<b>GOOD</b>

## NOTES ABOUT THE STAKEHOLDERS AND PARTNERS:

### **Overseas Institutions** (partners + stakeholders)

At present the institutions are mainly those currently associated with the Board of Trustees (e.g. Royal Society, IUCN); others are research institutions such as universities or media organizations such as TV filmmaking companies.

### **Tourism Operators / Shipping Agents** (stakeholders)

Foreign shipping agents and cruise line operators handle the cruise ships, but liaise with local companies such as Hunt Deltel and Mahé Shipping. Some local live-aboard boats visit Aldabra as part of their itinerary. Local tour operators handle tourists arriving on cruise ships that go to Aldabra (mainly Masons and Travel Services Seychelles (TSS)).

### **Government Ministries and Organisations** (stakeholders and partners)

The Seychelles President is the Patron of SIF. The Government is responsible for Aldabra as a World Heritage Site. Of the Government Ministries, the Ministry of Environment is the main partner; also to some extent the Ministry of Education and the Ministry of Tourism. Five government officials are currently on the Management Committee of SIF. Certain parastatals have smaller roles to play: Marine Parks Authority (MPA) and Seychelles Fishing Authority (SFA). The Port Authority is responsible for registering all boats going to Aldabra. Seychelles Coastguard survey Seychelles territorial waters. Other Government players are the Police and Judiciary, Health and Immigration officials.

### **IDC (Island Development Company)** (stakeholder and partner)

The parastatal organization, Island Development Company (IDC), is a major stakeholder and partner as its supply boats take almost all goods to Aldabra and its aeroplane takes personnel, some visitors and medical evacuees to and from nearby Assumption island, which is administered by IDC.

### **Non-Governmental Organisations (NGOs)** (partners)

The Marine Conservation Society of Seychelles (MCSS), Island Conservation Society (ICS), Nature Protection Trust of Seychelles (NPTS) and BirdLife Seychelles (newly renamed Nature Seychelles) are local partner organizations interested in Aldabra as a World Heritage Site. Wildlife Clubs of Seychelles (WCS) is not directly involved but members are interested and a few have been able to visit on educational trips. The majority of these groups have a participatory role rather than a direct role in management. However, several of the NGOs are represented either on the SIF Management Committee (2 people) or on the Scientific Sub-Committee. NGOs are brought together under an umbrella organization (LUNGOS), which is currently functioning in a rather limited way.

## PLANNING ASSESSMENT

### MANAGEMENT PLANNING ASSESSMENT

List of planning documents for Aldabra.

Name of plan	Year of preparation or most recent review	Level of approval of the plan (L,G,A,S/A,D)*	Year specified for next review of plan
Management Plan	1998	A/G	2005
Operations Manual	1998	A/G	2005

\*L = plan has force of law (usually has been approved by parliament or legal instrument)  
G = plan has been approved at government level but is not a legal instrument  
A = plan has been approved at Head of Agency level  
S/A = plan has been approved at a senior level within the Agency  
D = plan is a draft and has not been formally approved

#### Notes

1. Level of approval is given as A/G to reflect that the plan has been approved at Agency level, by the Board of Trustees of Seychelles Islands Foundation, but the Government appoints the Board and maintains a strong influence over the affairs of the Foundation.
2. Policies on zonation, tourism, research, etc. are to be found within the Management Plan.

#### Adequacy of the Management Plan for Aldabra

In general the Management Plan (including an Operations Manual) for Aldabra is good. It runs for 7 years (1998-2005) and provides most of the directions needed for management of the site. However, some weaknesses were identified:

- The “desired future” for Aldabra has perhaps been considered so obvious (protection of the existing natural situation) that it has not been stated more specifically in terms of “desired outcomes” (although the goals and objectives define them further). This may be because Aldabra is isolated and it has no indigenous population, and therefore has fewer anthropogenic environmental problems than many other World Heritage Sites.
- The Plan does not take into account the needs of certain stakeholders and they were not involved in the production of the Plan.
- Although research priorities are listed, other actions required by Management may not be so clearly prioritised from the point of view of decision makers with respect to allocation of resources.
- The section on budget management is less than adequate.

One of the major findings of the assessment was the lack of awareness of the contents of the Management Plan by many key players, who seemed insufficiently aware of the important role it should be playing in ensuring effective management of Aldabra. There has been little reference to the Plan during management meetings. The staff on Aldabra, on the other hand, were found to be using the Management Plan and the Operations Manual frequently to guide their actions.

#### **GAP**

- **Certain additional relevant environmental information is required to guide future management** (see other sections).
- **A better system is required for monitoring, reviewing and adjusting the Plan during its lifetime.**
- **Better guidance is required for finance and budget management.**

#### **RECOMMENDATIONS**

- **Specific objectives should be more clearly identified in the Plan** (unless they can instead be stated each year in an Annual Work Plan).
- **Certain policies should be updated, particularly for Tourism** (see also other sections).
- **When the Management Plan is due for review, ensure that stakeholders are included in the process.**
- **Ensure that a better system is introduced for reviewing and adjusting the Plan.**

## Adequacy of General Management Plan Data Sheet

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
<b>Decision making framework</b>	1. Plan establishes clear understanding of the desired future for the site (ie. describes the desired outcomes of management in terms that provides a guide to management and decision making by site managers)	<b>Good</b>	<p><i>VG</i> - desired future is clearly and explicitly articulated as a decision making reference point</p> <p><i>G</i> - desired future is clearly articulated</p> <p><i>F</i> - desired future is not clearly articulated but is implied or can be inferred from plan objectives</p> <p><i>P</i> - plan focuses more on present issues and actions and doesn't indicate a desired future for the site</p>	Although the Management Plan does not generally describe the desired <u>outcomes</u> of management in terms that provides a guide to management and decision-making by site managers, it is considered that this is heavily implied. A section headed "Major Policies For Aldabra" covers protection, conservation, research and monitoring, restoration and other priorities. Also, while a desired future for tourism is not articulated, there is an appendix to the Management Plan headed "Alternative Scenarios for the Future of Aldabra". There is also a SWOT analysis within the Plan.
	2. Plan provides sufficient guidance on the desired future for the site for it to act as a decision framework for addressing new issues and opportunities that arise during the life of the plan	<b>Good</b>	<p><i>VG</i> - desired future is expressed in a way that provides clear guidance for addressing new issues and opportunities</p> <p><i>G</i> - desired future is expressed in a way that focuses more on addressing current issues and opportunities</p> <p><i>F</i> - desired future lacks clarity and does not provide an effective decision framework for the future</p> <p><i>P</i> - plan focuses more on present issues and actions and doesn't indicate a desired future for the site</p>	<p>The desired future for Aldabra may not be expressed in a way that provides clear guidance for addressing current or new issues and opportunities. However, the desired future is clearly expressed in terms of maintaining the ecological integrity of Aldabra.</p> <p>There is a need for a redefined Tourism Policy. The Management Plan gives guidelines for tourists but this market has the capacity to evolve beyond the present limits and is in need of review.</p>

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
	3. Plan provides for a process of monitoring, review and adjustment during the life of the plan.	<b>Good</b>	<p><i>VG</i> - plan provides a clear, explicit and appropriate process for monitoring, review and adjustment</p> <p><i>G</i> - provisions for monitoring, review and adjustment of the plan are present but are incomplete, unclear or inappropriate in some minor respects</p> <p><i>F</i> - need for monitoring, review and adjustment is recognised but is not dealt with in any detail</p> <p><i>P</i> - plan does not address the need for monitoring, review and adjustment</p>	The need for monitoring, review and adjustment is recognised, but it is not dealt with in any detail. The Plan contains a summary table of Strategies and Actions, which is intended as a tool for the annual review of performance and progress during the AGM of SIF, following which a summary of policy changes and amendments relating to this Management Plan should be produced.
<b>Planning context</b>	1. Plan provides an adequate and appropriate policy environment for management of the World Heritage Area	<b>Good</b>	<p><i>VG</i> - Policy requirements for the site are identified and adequate and appropriate policies are established with clear linkages to the desired future for the site</p> <p><i>G</i> - Policy requirements for the site are identified and policies are largely adequate and appropriate</p> <p><i>F</i> - Policies in the plan are inadequate or incomplete in major respects</p> <p><i>P</i> - Plan either doesn't establish policies for the area or the policies are inadequate or inappropriate in major respects</p>	

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
	2. Plan is integrated /linked to other significant national/ regional/sectoral plans that influence management of the World Heritage Area	<b>Good / Fair</b>	<p>VG - Relevant national, regional and sectoral plans that affect the site are identified and specific provisions or mechanisms are included to provide for integration or linkage now and in the future</p> <p>G - Relevant national, regional and sectoral plans that affect the site are identified, their influence on the site is taken into account but there is little attempt at integration</p> <p>F - Some relevant national, regional and sectoral plans are identified but there is no attempt at integration</p> <p>P - No account is taken of other plans affecting the site</p>	<p>Although most of the relevant national, regional and sectoral plans are not specifically identified in the Plan, their influence on the site is taken into account by SIF management, because personnel are aware of such plans.</p> <p>(Needs to be stated in the Management Plan revision due in 2005, perhaps)</p>
<b>Plan content</b>	1. Plan is based on an adequate and relevant information base	<b>Good / Fair</b>	<p>VG - The information base for the plan is adequate in scope and depth and is matched to the key decisions, policies and issues addressed in the plan</p> <p>G - The information base is adequate in scope and depth but may contain some irrelevant information (i.e. a broad compilation of data rather than matching information to the decisions, policies and issues addressed in the plan)</p> <p>F - The information base has inadequacies in scope or depth so that some issues, decisions or policies cannot be placed into context</p>	<p>The information base is generally adequate but it is recognised that more information is needed on marine ecosystems, terrestrial vegetation and the impact of alien species on the terrestrial ecosystem.</p>

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
			P - Very little information relevant to plan decisions is presented	
<b>Plan content</b>	2. Plan addresses the primary issues facing management of the World Heritage Area within the context of the desired future of the site	<b>Good</b>	<p><i>VG</i> - Plan identifies primary issues for the site and deals with them within the context of the desired future for the site (i.e. plan is outcome rather than issues driven)</p> <p><i>G</i> - Plan identifies primary issues for the site but tends to deal with them in isolation or out of context of the desired future for the site</p> <p><i>F</i> - Some significant issues for the site are not addressed in the plan or the issues are not adequately addressed</p> <p><i>P</i> - Many significant issues are not addressed or are inadequately dealt with in the plan</p>	The Plan identifies the main issues, both in terms of policies and in the equivalent of Focal Management Targets. The outcome or desired future is assumed rather than specifically stated. A SWOT analysis is included in the Plan, which helps to identify some of the issues that still need to be tackled. However, the Tourism policy is in need of review and there is no real policy on restoration of habitats.
	3. Objectives and actions specified in the plan represent an adequate and appropriate response to the issues	<b>Good</b>	<p><i>VG</i> - Objectives and actions are adequate and appropriate for all issues</p> <p><i>G</i> - Objectives and actions are adequate and appropriate for most issues</p> <p><i>F</i> - Objectives and actions are frequently inadequate or inappropriate</p> <p><i>P</i> - Objectives and actions in the plan do not represent an adequate or appropriate response to the primary issues</p>	Tourism, habitat restoration, and response to climate change are perhaps the main exceptions at the moment. Specific objectives have to be more clearly defined.

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
	4. Plan takes account of the needs and interests of <u>Seychellois Civil Society</u> .	Fair	<p>VG - Plan identifies the needs and interests of <u>Seychellois Civil Society</u> and has taken these into account in decision making</p> <p>G - Plan identifies the needs and interests of <u>Seychellois Civil Society</u> but it is not apparent that these have been into account in decision making</p> <p>F - There is limited attention given to the needs and interests of <u>Seychellois Civil Society</u> and little account taken of these in decision making</p> <p>P - No apparent attention has been given to the needs and interests of <u>Seychellois Civil Society</u></p>	<p>There is no local or indigenous population on Aldabra. The wider Seychellois community, most of whom have never visited Aldabra, is taken into consideration in the Plan through the Education Policy.</p> <p>Further thought needs to be given to this area of concern.</p>
	5. Plan takes account of the needs and interests of <u>stakeholders other than Government</u> involved in the World Heritage Area	Good / Fair	<p>VG - Plan identifies the needs and interests of other stakeholders and has taken these into account in decision making</p> <p>G - Plan identifies the needs and interests of other stakeholders but it is not apparent that these have been into account in decision making</p> <p>F - There is limited attention given to the needs and interests of other stakeholders and little account taken of these in decision making</p> <p>P - No apparent attention has been given to the needs and interests of other stakeholders</p>	<p>Little is identified in the plan, except for the composition of the Board of Trustees and the Scientific Sub-Committee, and guidelines for tourism management. However, there are relatively few such stakeholders.</p> <p>Further thought needs to be given to this area as there is potential for further involvement of other stakeholders such as NGOs and civil society.</p>

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
Plan implementation	1. Plan provides adequate direction on management actions that should be undertaken in the World Heritage Area	<b>Good</b>	<p>VG - Management actions specified in the plan can be clearly understood and provide a useful basis for developing works programs, budgets and other operational plans and programs</p> <p>G - Management actions specified in the plan can generally be clearly understood and provide an adequate basis for developing works programs, budgets and other operational plans and programs</p> <p>F - Management actions are sometimes unclear or lacking in specificity making it difficult to use the plan as a basis for developing works programs, budgets and other operational plans and programs</p> <p>P - Management actions are often unclear or lacking in specificity making it very difficult to use the plan as a basis for developing works programs, budgets and other operational plans and programs</p>	<p>The Plan provides adequate direction, and is used by staff on Aldabra to guide their actions (as also is the Operations Manual). However, the Plan has not been used enough by the Management Committee during management decisions, even though it actually may provide guidance.</p> <p>If the Plan was used more, then perhaps annual work plans could be made, and the budget would be more useful as a guide to annual spending.</p>

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
	2. Plan identifies the priorities amongst strategies and actions in a way that facilitates work programming and allocation of resources	Fair	<p>VG - Clear priorities are indicated within the plan in a way that supports work programming and allocation of resources</p> <p>G - Priorities are indicated but are sometimes unclear making their use for work programming and resource allocation more difficult</p> <p>F - Priorities are not clearly indicated but may be inferred</p> <p>P - There is no indication of priorities within the plan.</p>	Research priorities are identified. Also the Plan contains a summary Management Strategy and Action Plan, which identifies priority actions. However, it is acknowledged that the current Plan may not be particularly accessible to decision makers from the point of view of allocation of resources.

## PLANNING ASSESSMENT

## DESIGN ASSESSMENT

The whole of Aldabra atoll is protected, including a distance of 1km all around the rim. This is a sufficient size to protect all species and habitats within the atoll. As there is no indigenous community, no areas are set aside for anything other than conservation in its broad sense. The major factor affecting management of the atoll lies less in its design than in its great distance (1000km) from the main island of Mahé, which is where SIF management headquarters is. Most of the relevant points are summarized in the data sheet, and in the text below.

### Zonation Policy

A feature of the design of Aldabra is a zonation policy, the details of which are given in the Management Plan. In summary the zones are as follows:

1. Restricted Zone – Ecologically sensitive areas, activities limited to non-manipulative research and monitoring, alien species removals, and limited controlled photography etc.
2. Protected Zone – The major part of Aldabra, providing opportunities for research and monitoring, photography and filming, and authorized visitors; also alien species removal.
3. Tourist Access Zone – Areas designated for limited educational and nature-conservation tourism; includes the Research Station and Old Settlement (where the cultural heritage is mostly situated).

Certain difficulties with this zonation have become apparent, with tour operators and tourists demanding to enter areas that were accessible before the zonation policy was put in place.

### Extent of Marine Boundary

Aldabra's protected area extends 1km offshore, which is sufficient to protect the coral reef ecosystem. There is a larger exclusion zone for oil tankers (see table below). Management has not been consulted in the establishment of such maritime regulations and is not aware of the logic of the limits chosen, which may or may not be ecologically sound.

### External interactions and Connectivity

Aldabra may act as a source for marine larvae (e.g. corals, prawns, fish) for the whole region. In addition it is a protected refuge for seabirds, turtles, whales and other migratory species. At present there is little information as to how important Aldabra may be in this respect. Although there are no unnatural limitations to marine species and migratory species as a result of site design, such species will be affected by conditions away from Aldabra. Changing the design of the Aldabra site will not improve this. However, a case could be made for including all four islands and atolls of the Aldabra group in some kind of multiple-use protected area (see note below). It might even be possible to envision an even larger clustering, to include Comores and Madagascar, (perhaps Mozambique and Tanzania as well) in order to harmonise certain policies on protected areas, fishing, poaching, etc. through regional co-operation (which is already in place). Both of these possibilities would have political implications.

## **GAP**

- **There is a need to establish a system for measuring the effectiveness of the zonation policy and reviewing it if necessary.**

## **OPPORTUNITIES**

- **Consider the possibility of including all four islands and atolls of the Aldabra group in one cluster with some kind of multiple-use protected status.**
- **Enhance the current regional co-operation initiatives so that protection for the whole region can be coordinated.**

### **Note on the Other Islands of the Aldabra group**

These other islands are managed by the Islands Development Company (IDC), a government parastatal.

1. Assumption. This island has a viable airstrip. A small group of IDC employees live there. It is used as an access point to Aldabra – visitors, staff and SIF Board of Trustees members fly by IDC plane to Assumption before transferring by boat to Aldabra. Assumption was mined in the past for guano and consequently lost much of its vegetation and most of its birds. There is potential for rehabilitation, in which SIF and Aldabra would have a vital role. Another concern for SIF is that Assumption has four alien species of land bird that could threaten the integrity of the avifauna of Aldabra, where there are no introduced bird species.
2. Cosmoledo. This atoll is presently uninhabited and has been subject to recent poaching. A project is being developed by a recently formed NGO (Islands Conservation Society) to protect and rehabilitate the atoll. The Board of Trustees of this NGO includes the Chairman of IDC. There is no doubt that SIF would play a vital role in rehabilitation plans. For example, Cosmoledo five species of land birds that still survive on Aldabra were formerly resident on Cosmoledo. Reintroduction to their former range is ecologically desirable. It could also act as an insurance policy for these species and perhaps relieve tourism pressure on Aldabra.
3. Astove. This atoll was once used for agriculture and is now an excellent dive site for experienced divers. Marine scientists have highlighted the importance of the reef ecosystem, which is worthy of protected area status. Again the case for rehabilitation is strong, and species extinct on Astove survive on Aldabra.

It should be noted that a GEF project has recently been initiated by the Seychelles Government, a component of which focuses on an ecosystem assessment of the outer islands, followed by an assessment of an integrated ecosystem management for the Aldabra group, with particular emphasis on Cosmoledo atoll.

## DESIGN ASSESSMENT: Data Sheet

Design aspect	Strengths of reserve design in relation to this aspect	Weaknesses of reserve design in relation to this aspect
<b>A. Ecological integrity</b>		
<b>Key areas</b>	The majority of key species are either confined to Aldabra or have their stronghold on Aldabra atoll. For a number of species, such as turtles, fish and shorebirds, Aldabra represents a breeding site and feeding area. The isolation and protection of the atoll enhances this aspect.	Absence of other islands of the Aldabra group within the protected area inhibits opportunities to reintroduce species from Aldabra that once occurred on these other islands (e.g. five land birds restricted to Aldabra once also occurred on Cosmoledo).
<b>Size</b>	The site is the world's largest raised atoll. The whole atoll and marine habitats to a distance of 1km around the atoll are protected. Populations of all key species are currently considered viable. Other islands of the Aldabra group are currently under the control of IDC (Islands Development Company), are underutilized and could perhaps be included in a larger multiple-use protected area.	Some species are migratory and will be affected by conditions away from Aldabra, but changing the design of the site will not improve this. Some species could be vulnerable to environmental extremes or human induced catastrophe. Inclusion of other islands in the Aldabra group within a larger protected area (though perhaps difficult to achieve) would increase opportunities to reintroduce Aldabran species, as an insurance policy for those species.
<b>External interactions</b>	There is an exclusion zone around the atoll measuring 61 nautical miles from north to south for oil tankers. Isolation of the atoll acts as a buffer to many human influences, such as pollution.	Human error could result in an oil spill, in spite of the exclusion zone, with possible catastrophic consequences. Intensive tuna fisheries in the area could impact species affected by their removal, e.g. sea birds relying on tuna to bring small fish to the sea surface.

Design aspect	Strengths of reserve design in relation to this aspect	Weaknesses of reserve design in relation to this aspect
		Further development of tourism in the area increases the risk of introducing new alien species, including diseases.
<b>Connectivity</b>	There are no unnatural limitations to marine species and migratory species as a result of site design.	Climate change is likely to affect all islands of the Aldabra group.
<b>B. Community well-being</b>		
<b>Key areas</b>	The distance of Aldabra from the population centres of Seychelles means that key resources have not been readily available to the general Seychelles population, particularly since the site became a Special Reserve.	Previous exploitation by temporary workers (19 <sup>th</sup> and early 20 <sup>th</sup> centuries) had significant effects on giant tortoise, turtle and probably fish populations. Their populations are still recovering. Currently there are few opportunities for Seychellois to visit the atoll for educational purposes.
<b>Size</b>	The small size of the community resident on this atoll means that the provision of ecological services is on a small scale and currently sustainable.	
<b>External interactions</b>	Aldabra's isolation and difficult terrain has protected it to a large extent from human exploitation.	The distance of Aldabra from Mahé (about 1000km) means that management remains troublesome and a real challenge, in spite of improved communication systems. The isolation of the atoll means that medical evacuation is difficult and expensive. The relative isolation and large size of the atoll makes poaching hard to police.

<b>Design aspect</b>	<b>Strengths of reserve design in relation to this aspect</b>	<b>Weaknesses of reserve design in relation to this aspect</b>
<b>Legal status</b>	Legal status is clear and generally well respected.	Seychellois boatmen may regard it their right to take natural resources from Aldabra.
<b>C. Management factors</b>		
<b>Legal status</b>	Legal status is clear.	The large size of Aldabra, the small number of staff and the distance from Mahé make enforcement a problem.
<b>Access points</b>	Access is controlled by SIF, the Port Authority and Immigration Control on Mahé.	Aldabra's distance from Mahé creates problems for would-be visitors from other countries, who may break laws in order to gain access far from the Research Station.
<b>Neighbours</b>	There are no boundary issues. Good relations with IDC, which controls the nearby island of Assumption, should allow for future cooperation on issues such as alien bird eradication, action on poachers, management of shipping movements, etc.	

## INPUT ASSESSMENT

### Staff numbers

Seychelles Islands Foundation has a small staff:

Headquarters on Mahé - Four people (Executive Director, Executive Officer, Assistant EO and Administrative Assistant).

Aldabra atoll - The number of staff fluctuates around 12 people (Warden, Research Officer, Logistics Manager, 2 or 3 Rangers, 1 or 2 Boatmen, Engineer/Mechanic, 2 Field Workers, 1 Cleaner + a number of occasional staff such as a Cook, Carpenter), together with visiting Scientists or Volunteers.

Vallée de Mai (the other WHS managed by SIF) - 9 workers

From the point of view of management, there is an additional Management Committee currently consisting of 7 people who are not paid for their input.

The number of staff currently appears to be more or less adequate, although if there are shortages for one reason or another, this puts additional pressure on the existing staff. This is true for both Aldabra and HQ, and further assessment of the situation may reveal additional requirements. On Aldabra this will be particularly true if the monitoring programme is enlarged or more research is carried out. For HQ it has been suggested that a part-time worker is necessary to assist the AEO when the supply boat is due to leave for Aldabra.

### Staff skills and training

Recruiting well-qualified local staff for Aldabra has never been easy. Some foreign nationals are still contracted for specialized posts that cannot be readily filled locally. The level of skills of staff varies considerably because of the short contracts (6 months to 2 years) made necessary by the extreme isolation of the atoll. Training for staff has therefore been of questionable value except in the short-term (e.g. ranger skills, first aid skills), although some staff do return after a break on Mahé. Short-term staff exchanges and an enhanced volunteer programme can improve skill levels to some extent and increase the dedication of workers. Capacity building can be carried out on the atoll through skill-sharing as well as by means of specific training courses. Perhaps there is also some way in which personal skills could be enhanced, to reduce the likelihood of conflicts. A multiple-skilled work force is to be encouraged.

There is a need for capacity building in HQ on Mahé. Administration skills need to be improved either by outside training or through assistance from a consultant with a broad and flexible approach to administration.

### Funds

The Seychelles Government gives an annual grant of SR100,000 and the Royal Society of London gives an annual grant of £5,000 (however, the latter is thinking of withdrawing this contribution and the amount received in Rupees fluctuates with the exchange rate). Aldabra is able to raise few funds of its own (approximately SR400,000 annually). Most of the revenue for SIF comes from entrance fees for Vallée de Mai, the other World Heritage site managed by SIF. This must be a unique arrangement, whereby one lucrative WHS subsidises another which is basically a scientific site. As long as tourism numbers remain high in Seychelles, this arrangement can work well. However, tourism is a fickle industry and Vallée de Mai requires some major financial input in the near future, so it would be much better for SIF to have a more independent source of funds. There has been a proposal to develop tourism on Aldabra in order to raise significant funds for the WHS, but this would bring into question the current interpretation of the Education Goal. There has been much debate over the issue during the time of this evaluation process, and investigations have been started into an alternative proposal to set up some kind of Trust Fund for Aldabra. This will require outside expertise and assistance. It is estimated that a sum of \$500,000 needs to be raised annually for Aldabra.

## **Budget**

For the past years, funding and income has covered the costs of running Aldabra. The waiving of certain taxes, and subsidies for some transport costs, have assisted in this process. However, the annual budget has often not been closely followed because of emergency purchases or unexpected costs (e.g. purchase of a flying inflatable boat and another inflatable boat without due reference to the priority needs of the site). Now that a maintenance schedule is in place, it may be easier to plan ahead for capital expenditure and supply of spare parts. However, because of the country's problems with foreign exchange, there has to be some flexibility. An annual audit is carried out by an authorized auditor.

## **Equipment and Infrastructure**

Detailed lists exist for all equipment and infrastructure on Aldabra. The Research Station buildings were renovated in 1996. Communication equipment has been significantly improved over the past few years. The Management Plan requires that environmentally friendly technologies should be adopted when possible. Current infrastructure and equipment is sufficient for the everyday running of the site, although improved computer facilities are required.

Tourism facilities are inadequate in terms of educational material and the lack of a proper visitor center, but the number of visitors is under 500 per year and the number of visiting cruise ships has reduced in the past couple of years, so facility improvement had been given lower priority.

## **Allocation of resources**

The assessment revealed that large amounts of time and effort have been put into maintenance and repair (perhaps due to absence previously of a proper maintenance schedule), and that there has been perhaps too great an emphasis on tortoise and turtle monitoring, at the expense of other programmes.

## **GAPS**

- **There is not a good system for identifying input requirements, for prioritizing them and then obtaining the most appropriate equipment etc. within the budget range.**
- **More forward planning is required in all areas (financial/budget/staff requirements).**
- **Staff skills needs to be charted more usefully and continually updated as staff change on Aldabra.**

## **RECOMMENDATIONS**

### **Staffing**

- **Capacity building is required at both HQ on Mahé and on Aldabra.**
- **Staffing adequacy will need reviewing in the light of future plans.**

### **Finance**

- **A proper financial strategy should be developed.**
- **Alternative financing proposals for Aldabra should be pursued.**
- **Ensure the budget is prepared with participation of Aldabra staff.**

### **General**

- **It would be valuable to share information and experience with another remote World Heritage Site or Protected Area with respect to administrative and staff issues.**

## INPUT ASSESSMENT - RESOURCE ALLOCATION COSTS

### Functional Area 1 - Repairs and Maintenance (per annum)

Action	Staff hours		Staff costs (SR)	Materials and Supplies (SR)	
	One off	Recurrent		One off	Recurrent
1. Field huts	480	160	10,240	9,500	
2. General maintenance		720	11,520		87,960
3. Boats		360			60,000
4. Water storage		480	7,680	4,000	
5. Water tower	480		7,680	6,500	
6. Power house		2080	47,840	65,000*	4,500
7. Trail clearing		1080	17,280		800
8. Carpentry/masonry		1816	29,056		2,500
9. Plumbing		1264	20,224	3,200	
10. Cleaning		2080	47,840		2,200
11. Overtime		2500	62,400		
<b>Staff hours: 13,500 Staff Costs: SR261,760 Materials &amp; Supplies Costs: R246,160</b>					

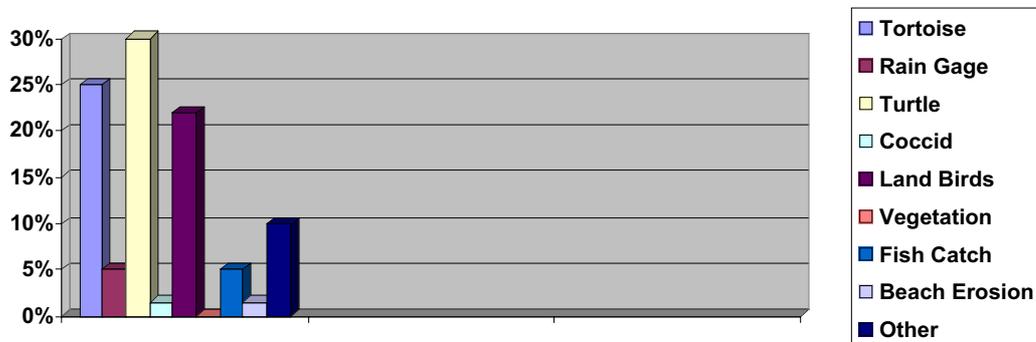
\* New generator

### Functional Area 2 - Monitoring (per annum)

Action	Staff hours	Staff costs (SR)	Materials & Supplies (SR)
1. Rangers	4160	73,080	4,500*
2. Research Officer	2080	84,000	
3. Camps	1800	32,400	25,000
4. Fuel			27,000
<b>Staff hours: 8,040 Staff costs: SR189,480 Materials &amp; Supplies Costs: SR56,500</b>			

\* Inclusive of 1 and 2

#### % Staff Hours



**Functional Area 3 - Natural Resource Management (per annum)**

Action	Staff hours		Staff costs (SR)	Supplies & Materials (SR)	
	One off	Recurrent		One off	Recurrent
1. Fishing		576	9,216		2,800
<b>Staff Hours: 576 Staff Costs: SR9,216 Supplies &amp; Materials Costs: SR2,800</b>					

**Functional Area 4 - Patrols (per annum)**

Action	Staff hours		Staff costs (SR)	Supplies & Materials (SR)	
	One off	Recurrent		One off	Recurrent
1. Outside lagoon		4,160	79,040		
2. Inside lagoon		2,080	39,520		
3. Fuel					54,500
<b>Staff Hours: 6,240 Staff Costs: SR118,560 Supplies &amp; Materials Costs: SR54,500</b>					

**Functional Area 5 - Visitor Contact Management (per annum)**

Action	Staff hours		Staff costs (SR)	Supplies & Materials (SR)	
	One off	Recurrent		One off	Recurrent
1. Visiting yachts		120	2,160		
2. Cruise ships		24	432		
3. Charter		48	864		
4. School kids		60	1,080		
5. Researchers /Film crews		120	2,160		
6. Overtime		93*	3,510		
7. Fuel					6,000
<b>Staff Hours: 372 Staff Costs: SR10,206 Supplies &amp; Materials Costs: SR6,000</b>					

\* Overtime calculation is based on extra costs of staff hours accumulated 1-5

**Functional Area 6 - Research Projects (per annum)**

Action	Staff hours		Staff costs (SR)	Supplies & Materials (SR)	
	One off	Recurrent		One off	Recurrent
1. DOE		304.5	5,481		
2. Rails		304.5	5,481		
3. Marine prog.		20	360		
4. Fuel					12,500
<b>Staff Hours: 629 Staff Costs: SR11,322 Supplies &amp; Materials Costs: SR12,500</b>					

### Functional Area 7 - Administration (per annum)

Action	Staff hours		Staff costs (SR)	Supplies & Materials (SR)	
	One off	Recurrent		One off	Recurrent
1. Managers		6,240*	282,000		
2. Communication					90,000**
3. Purchasing		1,387	36,000		
4. Insurance					35,500
5. Transportation					250,000
6. Staff costs (taxes 10%, training, clothing)					82,963
<b>Staff Hours: 7,627 Staff Costs: SR318,000 Supplies &amp; Materials Costs: SR458,463</b>					

\* Inclusive of 2,5,6

\*\*Mainly by Purchasing Officer (who is the AEO)

### RESOURCE MANAGEMENT TOTAL

Functional Area	Staff hours	Staff costs (SR)	Supplies, Materials, Services (SR)
1. Repairs & Maintenance	13,500	241,860	246,160*
2. Monitoring	8,040	189,480	56,500
3. Natural Resource Mgt.	576	9,216	2,800
4. Patrols	6,240	118,560	54,500
5. Visitor Contact Mgt.	372	10,206	6,000
6. Research Projects	629	11,322	12,500
7. Administration	7,627	318,000	458,463
<b>Totals per annum</b>	<b>33,745</b>	<b>898,644</b>	<b>820,263</b>
<b>Total Costs</b>		<b>SR 1,718,907</b>	

\*Inclusive of equipment upgrading and some capital expenditure

### Summary of HQ (Mahé) Input Totals

These are included in the HQ budget and management totals above, but not reflected in the Aldabra budget. Salaries are based on the percentage of staff input to Aldabra.

Transport	SR 12,000		
Insurance	SR 35,500		
Communications	SR 45,000	<b>Total Cost of HQ Input:</b>	<b>SR 244,700</b>
Purchasing Officer	SR 36,000		
Executive Officer	SR 35,000	<b>Total Input Costs:</b>	<b>SR 1,718,007</b>
Executive Director	SR 65,000		
Secretary	SR 15,200	<b>Aldabra Budget 2001:</b>	<b>SR 1,482,000</b>

## Summary Table of Expenditure 2001 and Budget 2002

ALDABRA		ACTUAL EXPENDITURE 2001				BUDGET 2002
		1 <sup>st</sup> Qrt	2 <sup>nd</sup> Qrt	3 <sup>rd</sup> Qrt	4 <sup>th</sup> Qrt	
Accommodation		2,000.00	2,000.00	2,000.00	2,000.00	2,000.00
Capital Expenditure						85,000.00
Camp visit issues		5,091.13	7,349.60	12,215.11	17,590.44	20,000.00
Cleaning materials		280.00	280.00	370.00	370.00	1,000.00
Fuel and Gas		27,750.00	75,441.00	87,775.60	102,414.75	100,000.00
Office Supplies		9,291.00	10,684.55	12,506.55	12,880.55	10,000.00
Repairs and maintenance		101,054.70	151,088.57	182,630.10	466,694.19	150,000.00
Staff costs		156,772.07	288,990.78	592,773.50	724,466.40	800,000.00
Sundries		72.30	97.55	2,872.00	4,066.15	5,000.00
Telephone, fax and postage		56,713.70	118,101.14	118,101.14	170,019.40	65,000.00
Transportation/ Loading		281,100.00	342,839.00	306,839.00	357,617.00	244,000.00
		<b>640,124.90</b>	<b>996,872.19</b>	<b>1,318,083.00</b>	<b>1,858,118.88</b>	<b>1,482,000.00</b>

## SIF REVENUE FOR 2001 (TOTAL)

### Income from Vallée de Mai

SR 3,136,080 (of which SR 2,679,423 is from entrance fees)

### Income from Aldabra

SR 384,288 (of which SR100,000 is a grant from the Seychelles government and SR42,152 is a grant from the Royal Society of UK)

### Other income

SR 523,152 (of which SR 328,015 is donations)

After all expenditures, SIF had a surplus of SR 562,323 for the year.

## STAFF SKILLS REGISTER FOR EARLY 2002

Note that the competence rating will vary considerably over the year, due to staff change-overs.

### Staff members on Aldabra

Management Level: Warden, Logistics Manager, Research Officer

Field Staff: Rangers x 2, Boatmen x 2

Maintenance Staff: Mechanic, Labourers x 2, Cleaner

	<u>Competence Rating</u>
<b>Small Engine Maintenance</b>	
- Mechanic	Excellent
- Boatmen	Good
<b>Vessel Operation</b>	
- Boatmen	Excellent
- Warden	Excellent
<b>First Aid</b>	
- Warden	Excellent
- Logistics Manager	Satisfactory
- Research Officer	Good
<b>Computer Literacy</b>	
- Warden	Satisfactory
- Rangers	Satisfactory - Poor
- Logistic Manger	Excellent
- Research Officer	Excellent
<b>Monitoring Techniques</b>	
- Research Officer	Excellent
- Warden	Satisfactory
- Logistics Manager	Satisfactory
- Rangers	Good
<b>Visitor Management</b>	
- Research Officer	Good
- Warden	Excellent
- Logistics Manager	Excellent
- Rangers	Good

**NOTE** It has been suggested that for future use a further column could be added, giving details of personality qualities or problems, which might also affect the smooth running of Aldabra.

## PROCESS ASSESSMENT

### RATING SYSTEM FOR PROCESS INDICATORS

There were difficulties with the preparation of this part of the assessment and it is therefore not complete. However, the basic assessment of Process as judged by the Process Assessment Summary Table is that several areas of importance are being managed at effectiveness levels of about 60% or more. These relate to Legal Status, Information Availability and Planning, Ecosystem Management and Visitor Management.

Throughout the whole evaluation process however, it was apparent that there are major difficulties with administering a World Heritage Site which is very distant from the administration headquarters. The whole administration process is in need of considerable review if the situation is to be improved. However, it is felt that prescriptions for good management practices as applied to "normal" situations may not work for Seychelles Islands Foundation / Aldabra. A more flexible approach is required, but without compromising good management. Some broad and open-minded assistance will be required, and perhaps exchange of experiences with other agencies that have to manage very remote bases. At the same time one has to bear in mind the very small population of Seychelles (80,000) from which human resources are drawn.

Another major issue is Financial Sustainability and Budget Control, which are in great need of review. The process is already underway with the current Management (SIF). There are areas where assistance and/or exchange of ideas with other Protected Areas will be beneficial.

Areas which are in need of improvement are:

- Law enforcement
- Certain ecosystem information (see other sections)
- The research programme
- Contingency plans for threats to the atoll
- Overall administration (personnel, staffing, communications, etc.)
- Annual work plans
- Budget formulation
- Partnerships

#### GAPS

- **There are still some gaps in the data table with respect to Management Systems, Finance and Ecosystem Management** (which have been subdivided to enable better analysis of processes within them)

#### RECOMMENDATIONS

- **Devise a series of standards by which to assess current and future performance in the 'Gap' areas mentioned above (and elaborated in the data table).**
- **Following this, it will be easier then to see where improvements can be made to the following:**
  - **Management Systems** (Facility development, Staffing and staff training, Personnel management, Communications)
  - **Finance** (Financial sustainability, Budget control)
  - **Ecosystem Management** (Monitoring and Evaluation, Research, Restoration)
- **Secure the advice of a suitable management expert for capacity building.**
- **Exchange experiences with other agencies managing remote locations.**
- **Others of the improvements mentioned above are dealt with in other sections.**

## Rating System for Process Indicators Worksheet

Criteria	Rating	Comments	Actual score
<b>Issues: LEGAL STATUS</b>			
<b>1. Legislation</b> a. Problems with legislation or regulations represent a major barrier to achieving management objectives. b. Problems with legislation or regulations are a significant but not major barrier to achieving management objectives. c. Problems with legislation or regulations are not a barrier to achieving management objectives. d. Legislation or regulations are particularly effective in achieving management objectives.	Poor  Fair  <u>Good</u>  Very good	<b>Out of management control:</b> Laws and major regulations are laid down by Government. They are basically sufficient to allow management objectives to be achieved. Specific laws relating to the environment and biodiversity can also be brought into play. <b>Possible actions:</b> <ul style="list-style-type: none"> <li>• The absence of a lease for Aldabra is being followed up.</li> <li>• Some environmental laws need updating; more specific legislation might enhance the effectiveness of achieving management objectives. SIF could play a role in this process, through participation where this is possible.</li> <li>• Ensure that all regulations are followed by all staff and all visitors.</li> </ul>	<b>GOOD</b>
<b>2. Law enforcement</b> a. There is no effective capacity to enforce protected area legislation and regulations. b. There are major deficiencies in law enforcement capacity c. Law enforcement capacity is acceptable but some deficiencies are evident. d. Law enforcement capacity is excellent.	Poor  <u>Fair</u>  <u>Good</u>  Very good	Although the current level of poaching is relatively low, isolation and the large size of the atoll make law enforcement difficult in some cases (e.g. boats seen poaching), including collection of evidence. Lack of capacity to run regular boat patrols. Warden is the only law enforcer on the atoll, so that much depends on his/her attitude and knowledge of the law. <b>Management initiatives:</b> Obtaining a rapid-response boat; but there are continuing problems with its suitability, efficiency and use. <b>Possible actions:</b>	<b>FAIR / GOOD</b>

Criteria	Rating	Comments	Actual score
		<ul style="list-style-type: none"> <li>• Increase the capacity to run regular boat patrols (acquire a boat and trained staff for this). Note that this requires considerable financial commitment.</li> <li>• Better contingency plans, and/or international co-operation.</li> </ul>	
<b>Issues: INFORMATION AVAILABILITY and PLANNING ABILITY</b>			
<b>3. Planning system</b> a. There is no management plan for the protected area. b. A management plan is being prepared or has been prepared but is not being implemented. c. An approved management plan exists but it is only being partially implemented because of funding constraints or other problems. d. An approved management plan exists and is being implemented.	Poor  Fair  <u>Good</u>  Very good	Management Plan 1998-2005 is approved and in place, including an Operations Manual. It is being more or less implemented, but is not referred to enough when decisions are being made and there is a lack of continuity. It needs more clearly identified objectives for the future. The plan contains a means of reviewing progress annually but this has been only partially implemented. Also, Aldabra seems to lurch from one crisis to another and this means time, money and effort sometimes go into immediate problem-solving rather than furthering the plans. <b>Possible actions:</b> <ul style="list-style-type: none"> <li>• Deal with the situations which give rise to crises.</li> <li>• Prepare <u>annual work plans</u> and budgets.</li> <li>• Ensure reviewing process takes place annually.</li> <li>• Revise Management Plan ready for 2005 (or before).</li> </ul>	<b>GOOD</b>
<b>4. Ecosystem inventory</b> a. There is little or no information available on the natural/cultural resources of the area. b. Information on the natural/cultural resources is not sufficient to support planning and decision making.	Poor  Fair	Much research has been carried out on Aldabra and there has been a regular monitoring programme in place for many years. This is used to guide management decisions. There are still some gaps with respect to invasive aliens, marine and coastal habitats, and also vegetation. <b>Possible actions:</b>	<b>GOOD</b>

Criteria	Rating	Comments	Actual score
<p>c. Information on natural/cultural resources is sufficient for key areas of planning / decision making or this information is being rapidly acquired.</p> <p>d. Information concerning natural /cultural resources is sufficient to support most or all areas of planning and decision making.</p>	<p><u>Good</u></p> <p>Very good</p>	<ul style="list-style-type: none"> <li>• Further research and monitoring of marine habitats, in particular, should be carried out.</li> <li>• Further studies of the impact of alien species.</li> <li>• Improved vegetation studies + initiation of monitoring programme.</li> <li>• Such studies will need to be prioritized.</li> </ul>	
<b>Issues: ECOSYSTEM MANAGEMENT and VULNERABILITY CONTROL</b>			
<p><b>5. Ecosystem management</b></p> <p>a. Requirements for active management of natural and cultural resources (e.g. fire mgt, feral animal control, cultural sites) have not been assessed.</p> <p>b. Requirements for active management of natural and cultural resources are known but are not being addressed.</p> <p>c. Requirements for active management of natural and cultural resources are only being partially addressed.</p> <p>d. Requirements for active management of natural and cultural resources are being fully or substantially addressed.</p> <p><b>Note: This section will need expanding into 3 parts: Monitoring and Evaluation; Research; Restoration</b></p>	<p>Poor</p> <p>Fair</p> <p><u>Good</u></p> <p>Very good</p>	<p><b>Out of management control:</b> Most effects of climate change are outside management control. To some extent, unwanted introductions can be reduced through good precautionary practices, but diseases, pests or aliens brought in by wind (for example) are difficult to stop.</p> <p><b>Management initiatives:</b> A number of monitoring programmes have been in place for a substantial period of time.</p> <p>Goats have been eradicated from two islands but some remain on the largest island of Grande Terre. There is an opportunity to go for total eradication but it is difficult and expensive.</p> <p><b>Possible actions:</b></p> <ul style="list-style-type: none"> <li>• Monitoring programmes need to be re-evaluated.</li> <li>• Research programme needs revamping.</li> <li>• Maintain vigilance with respect to new alien species entering.</li> <li>• Devise contingency plan for any new invasion.</li> <li>• Cats, rats and alien plant species need further study.</li> <li>• Contingency plan for fire.</li> <li>• Contingency plan for oil spill.</li> </ul>	<p><b>GOOD</b></p>

Criteria	Rating	Comments	Actual score
		<ul style="list-style-type: none"> <li>• Devise plans for Old Settlement and other historical sites.</li> <li>• Devise policy for restoration of natural areas.</li> </ul>	
<p><b>6. Control over access/use of the protected area</b> (<i>see also Visitor access</i>)</p> <p>a. Protection systems (patrols, permits, etc.) are ineffective in controlling access or use of the reserve in accordance with designated objectives.</p> <p>b. Protection systems are only partially effective in controlling access or use of the reserve in accordance with designated objectives.</p> <p>c. Protection systems are moderately effective in controlling access or use of the reserve in accordance with designated objectives.</p> <p>d. Protection systems are largely or wholly effective in controlling access or use of the reserve in accordance with designated objectives.</p>	<p>Poor</p> <p><u>Fair</u></p> <p><u>Good</u></p> <p>Very good</p>	<p>Protection systems with respect to patrols are not 100% effective but are about as good as they can be under the circumstances.</p> <p>At the moment incidents of infringement are not regular.</p> <p><b>Possible action:</b></p> <ul style="list-style-type: none"> <li>• Improve the ability to patrol the atoll.</li> <li>• Upgrade within-atoll communication so that any boat spotted in a distant part of the atoll can be reported at once.</li> <li>• Look into possibilities for regional co-operation on control of boats in the region.</li> <li>• Use the Flying Inflatable Boat for patrolling.</li> <li>• Assistance from "live aboard" boats in patrol work.</li> <li>• Install radar system to spot intruding boats.</li> </ul>	<p><b>FAIR / GOOD</b></p>
<b>Issues: MANAGEMENT SYSTEMS</b>			
<p><b>Management systems</b> (<i>this needs to be expanded into different sections if it is to be useful to SIF - SEE SUGGESTIONS BELOW</i>)</p> <p>a. Problems with management systems (e.g. budgeting, office procedure, staff training) significantly constrain management effectiveness.</p>	<p>Poor</p>	<p>The distance between Aldabra and Mahe creates a whole set of problems which are difficult to resolve. The distance is out of management control. However, it affects staffing, communications, support and supply systems, maintenance, training, etc.. It contributes to rapid changeover of staff, difficulty in recruitment of suitably qualified staff, and difficulty with solving staff problems on Aldabra.</p>	<p><b>FAIR</b></p>

Criteria	Rating	Comments	Actual score
b. Problems with management systems partially constrain management effectiveness. c. Management systems provide basic support to managers. d. Management systems provide active and effective support to managers.	Fair  Good  Very good	The number of staff in HQ on Mahe is limited. <b>Possible action:</b> Perhaps a creative re-thinking of the way SIF management works is necessary. This should be part of the management effectiveness programme, and could include a training element or capacity building for management staff.	
<b>7. Facility development</b> This issue will need to be expanded as part of the next phase of the project.		SIF should be slowly introducing more sustainable, environmentally friendly technology to Aldabra. Certain buildings and camps require renovation and other facilities require updating.	
<b>8. Maintenance</b> a. Little or no maintenance of equipment / facilities is undertaken. b. Maintenance is only undertaken when equipment/facilities are in need of repair. c. Most equipment/facilities are regularly maintained. d. All equipment/facilities are regularly maintained.	Poor  Fair  Good  Very good	Maintenance of equipment and facilities occupies a large proportion of staff time and costs. Problems with obtaining good quality equipment and supplies, and foreign exchange difficulties in the country (out of management control), together with lack of staff competence (in some cases) lead to difficulties in keeping up regular maintenance to a more than adequate standard. <b>Management initiatives:</b> A regular maintenance schedule has recently been introduced. <b>Possible actions:</b> <ul style="list-style-type: none"> <li>• Provide training for staff to equip them with maintenance skills.</li> <li>• Look into low maintenance and/or appropriate technology alternatives?</li> </ul>	<b>FAIR / GOOD</b>

Criteria	Rating	Comments	Actual score
<p><b>9. Staffing and staff training</b> This issue will need to be expanded as part of the next phase of the project.</p>		<p>There are problems with recruiting suitable staff, retaining them (there is lack of continuity), training them (e.g. for emergency situations) and providing suitable skill improvement opportunities. A multiskilled workforce is best. The mandatory orientation programme for all new staff requires implementation. The volunteer programme needs to be developed further.</p>	
<p><b>10. Personnel management</b> This issue will need to be expanded as part of the next phase of the project.</p>		<p>Fostering a cooperative approach (team building) is essential. So much depends on the chemistry of the mix of people on Aldabra at any one time. Having a good warden can make a big difference in overcoming and managing inter-personal conflicts. People have to be aware that negative behaviour affects the future of Aldabra as a protected area, whereas cooperation ensures that everyone makes a positive contribution. Bottom-up as well as top-down approach is useful to management.</p>	
<p><b>11. Communication</b> This issue will need to be expanded as part of the next phase of the project.</p>		<p>Communication needs to be improved at all levels and in all situations. Also, good communication systems are vital to the proper running of a distant protected area, both between Aldabra and HQ, and within the large atoll itself.</p>	
<b>Issues: FINANCE AND BUDGETS</b>			
<p><b>12. Financial sustainability</b> This issue will need to be expanded as part of the next phase of the project.</p>		<p>Aldabra needs to become more self-sustaining financially. Various initiatives are in the pipeline. There are possibilities for small-scale fund-raising as well as large scale.</p>	
<p><b>13. Budget control and record keeping</b> This issue will need to be expanded as part</p>		<p>More consultation is needed in the formulation of the annual</p>	

Criteria	Rating	Comments	Actual score
of the next phase of the project.		budget and allocation of money. Better control is required over spending and a different system is needed for purchasing.	
<b>Issues: PARTNERSHIPS</b>			
<b>14. Communication with stakeholders /partners</b> a. There is little or no communication between managers and stakeholders involved in the protected area. b. There is communication between managers and stakeholders but this is ad hoc and not part of a planned communication programme. c. There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders but implementation is limited. d. There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders.	Poor  <u>Fair</u>  <u>Good</u>  Very good	All overseas and local Board members are provided with minutes of local management meeting minutes, and Aldabra manager's and Research Officer's monthly and annual reports. Members of NGOs who sit on the Board or on the Science Sub-Committee are also made aware of issues pertaining to management and the science programme. There is limited but planned communication between SIF managers and some partners and stakeholders, e.g. IDC and the Port Authorities, tourism operators. There is also regular communication with other protected areas in Seychelles. <b>Management initiatives:</b> <ul style="list-style-type: none"> <li>• A website has been developed for Aldabra.</li> <li>• A newsletter is published twice a year.</li> <li>• Several films have been made which can increase awareness and support both locally and abroad.</li> </ul> <b>Possible actions:</b> Improve efficiency of communication. Foster a cooperative approach wherever possible. Generate further support from current and potential stakeholders, particularly regional and international ones.	<b>FAIR / GOOD</b>
<b>15. Communication with neighbours</b> a. There is no contact between managers and individuals or groups who own or manage neighbouring lands and seas.	Poor	Note that there is no permanent indigenous community in the area. All residents are temporary. There is regular communication with the neighbouring island of	<b>FAIR / GOOD</b>

Criteria	Rating	Comments	Actual score
<p>b. There is limited contact between managers and individuals or groups who own or manage neighbouring lands and seas.</p> <p>c. There is regular contact between managers and neighbours but limited cooperation on issues of mutual concern.</p> <p>d. There is regular contact between managers and neighbours and issues of mutual concern are cooperatively addressed.</p>	<p><u>Fair</u></p> <p>Good</p> <p>Very good</p>	<p>Assumption, which is approximately 30km from the site. Although there are few issues of mutual concern (as Assumption has different priorities), cooperation is very good.</p> <p>At the Aldabra site, Seychelles EEZ is relatively close to that of Tanzania, Comores and Madagascar. The only communication about issues of mutual concern (e.g. movement of major oil shipments, fisheries) is through regional initiatives and agreements.</p> <p><b>Possible actions:</b></p> <p>Assumption staff may be able to help with the tracking of poachers.</p> <p>Regional cooperation should be improved with respect to EEZ issues, protected area management and poaching issues.</p>	
<p><b>16. Benefits to Seychellois community</b></p> <p>a. There are no benefits to Seychellois from the reserve.</p> <p>b. There is some indirect benefit to Seychellois from the reserve, but this is very limited.</p> <p>c. Some Seychellois benefit from the reserve by obtaining work on the atoll or visiting it in some capacity. Others receive only indirect benefit.</p> <p>d. A greater number of Seychellois are able to benefit from the reserve, either on a temporary basis through work exchanges, volunteering or easier access. There is greater involvement of civil society, however indirectly.</p>	<p>Poor</p> <p><u>Fair</u></p> <p><u>Good</u></p> <p>Very good</p>	<p>Seychellois are employed as far as possible in all posts.</p> <p>There is little <u>direct</u> economic benefit to the country as a whole, but indirectly the country gets much recognition from having two World Heritage Sites, and some economic benefit comes through cruise ships (for example) calling in also at Mahe and other islands.</p> <p><b>Management initiatives:</b></p> <ul style="list-style-type: none"> <li>• A limited number of school children now have visits to the reserve as prizes for achievements in environmental fields.</li> <li>• There is some exchange of rangers with other organizations.</li> </ul> <p><b>Possible actions:</b></p> <p>Look for ways in which to encourage further involvement by civil society, e.g. in financing the reserve.</p> <p>Find ways of making it easier and cheaper for Seychellois to visit Aldabra (suitably supervised), perhaps when it becomes easier to</p>	<p><b>FAIR / GOOD</b></p>

Criteria	Rating	Comments	Actual score
		visit <u>all</u> outer islands.	
<b>Issues: VISITOR MANAGEMENT</b>			
<p><b>17. Control over visitor access</b> (<i>This may be duplicating No. 5 - Vulnerability control</i>)</p> <p>a. Visitor access to the reserve is not controlled.</p> <p>b. Visitor access to the reserve is controlled by permits, but unauthorized vessels are also allowed to land.</p> <p>c. Visitor access to the reserve is controlled by permits, and unauthorized vessels are not allowed to land.</p> <p>d. Visitor access to the reserve is strictly controlled by all means possible.</p>	<p>Poor</p> <p>Fair</p> <p><u>Good</u></p> <p>Very good</p>	<p>System for permits is in satisfactory order with respect to visitors, cruise ships and yachts.</p> <p>All visiting vessels are required to obtain prior authorisation from Mahe. This creates problems for vessels travelling from Comores, Madagascar or the African mainland.</p> <p>Currently, unauthorised yachts (often in supposed distress) request permission to land but are only allowed access to ascertain the problem.</p> <p><b>Possible action:</b> Ensure that information about the permit system is on the website and available to all likely visitors (e.g Yacht Club notice board).</p>	<b>GOOD</b>
<p><b>18. Visitor opportunities</b></p> <p>a. No consideration has been given to the provision of visitor opportunities in terms of access to areas of the park or the diversity of available experiences.</p> <p>b. Some consideration has been given to the provision of visitor opportunities in terms of access to areas of the park or the diversity of available experiences but little or no action has been taken in this regard.</p> <p>c. Consideration has been given to the provision of visitor opportunities in</p>	<p>Poor</p> <p>Fair</p> <p><u>Good</u></p>	<p>Tourism guidelines and policies are laid out in the Management Plan.</p> <p><b>Management initiatives:</b> A zonation policy has been introduced, restricting visitor access to certain areas. These areas have been chosen to give visitors a diversity of experiences (which have been based on informal research of visitors' wants). The Aldabra rail has been successfully translocated to the island of main visitation, allowing viewing without requiring access to other islands.</p> <p>Options to extend visitor activities have been discussed at Board level and a travel expert has visited the atoll to assess the</p>	<b>GOOD</b>

Criteria	Rating	Comments	Actual score
<p>terms of access to areas of the park and the diversity of available experiences. Policies and programs to enhance visitor opportunities have been implemented.</p> <p>d. Management of visitor opportunities is based on research into visitor's needs and wants. Plans to optimize visitor opportunities have been implemented.</p>	Very good	<p>possibilities, but no concrete plans have yet been taken up. Some programmes have been implemented to provide for an annual school visit.</p> <p><b>Possible actions:</b></p> <ul style="list-style-type: none"> <li>The zonation policy may need to be revised, but with great care not to compromise biodiversity objectives.</li> <li>Visitor satisfaction monitoring should be introduced.</li> </ul>	
<p><b>19. Visitor facilities</b></p> <p>a. Visitor facilities and services are grossly inadequate (either do not meet the needs of most visitors or visitor use is seriously damaging resources)</p> <p>b. Visitor facilities and services are inadequate (either do not meet the needs of most visitors or visitor use is seriously damaging resources).</p> <p>c. Visitor facilities and services are adequate for current levels of visitation.</p> <p>d. Visitor facilities and services are excellent for current level of visitation.</p>	<p>Poor</p> <p><u>Fair</u></p> <p><u>Good</u></p> <p>Very good</p>	<p>Although facilities are adequate, certain improvement measures can be taken. When a large cruise ship visits, there is pressure on staff and it can interfere with monitoring work.</p> <p><b>Possible actions:</b></p> <ul style="list-style-type: none"> <li>Provide uniforms and training for staff who are guiding visitors.</li> <li>An information center with educational displays should be made a reality.</li> <li>If tourist numbers increase, more staff may be required and special training initiated.</li> </ul>	<b>FAIR / GOOD</b>

**Note: With respect to IUCN Protected Area Categories, Aldabra belongs to CATEGORY Ia (Strict Nature Reserve) but Category II is also relevant (ecosystem + recreation = National Park) because it is used for controlled educational tourism.**

## Process Assessment Summary Table

Main Issues	Criteria	Maximum score	Current score	Effectiveness (percentage)
Legal status	1. Legislation	3	2	67%
	2. Law enforcement	3	1.5	50%
		<b>6</b>	<b>3.5</b>	<b>59%</b>
Information availability and Planning ability	3. Planning system	3	2	67%
	4. Ecosystem inventory	3	2	67%
		<b>6</b>	<b>4</b>	<b>67%</b>
Ecosystem management and Vulnerability control	5. Ecosystem management a. Monitoring & Evaluation b. Research c. Restoration	3	2	67%
	6. Control over access/use of Aldabra	3	1.5	50%
		<b>6</b>	<b>4</b>	<b>59%</b>
Management systems	7. Facility development			
	8. Maintenance			
	9. Staffing and staff training			
	10. Personnel management			
	11. Communication			
	<b>At the moment:</b>	<b>3</b>	<b>1</b>	<b>33%</b>
Finance and budgets	12. Financial sustainability			
	13. Budget control and record keeping			
				<b>?</b>
Partnership	14. Communication with stakeholders / partners	3	1.5	50%
	15. Communication with neighbours	3	1.5	50%
	16. Benefits to Seychellois community	3	1.5	50%
		<b>9</b>	<b>4</b>	<b>50%</b>
Visitors and nature-conservation tourism	17. Control over visitor access	3	2	67%
	18. Visitor opportunities	3	2	67%
	19. Visitor facilities	3	1.5	50%
		<b>9</b>	<b>5.5</b>	<b>61%</b>

## OUTPUT ASSESSMENT

### MANAGEMENT PLAN IMPLEMENTATION DATABASE

#### Current system of assessing implementation of Management Plan

As noted in the Management Plan Assessment, there is already a table summarizing the Management Strategy and Action Plan within the Management Plan for Aldabra. However, at the Annual General Meeting of SIF, this has been used only in a general way to guide decisions about actions for positive change, rather than as a tool for monitoring annual performance and progress.

It groups Management Actions as follows:

1. Administration
  - a. SIF Annual General Meeting
  - b. SIF on Mahé
  - c. SIF on Aldabra
2. Policy Development
3. Finance
4. Staffing
5. Tourism
6. Research
7. Monitoring
8. Environmental Protection Measures

As shown in the example below, actions are listed in the table, with priority Management Actions highlighted in bold. References are made to the appropriate section of the Management Plan containing further information.

#### Example of current implementation review tool from the Aldabra Management Plan

#### 7. MONITORING

*Management objective: to improve the quality of the monitoring programme.*

Actions	1998-1999	2000-2001	2002-2005
• <b>Reassess the value of each monitoring programme and review the methodology</b> (Operations Manual Part 6 & 7)	++	+	+
• Improve the standard of entry and capacity of the Rangers (see above, No. 4)	+	+	+
• Re-activate the beach erosion and accretion monitoring programme (3.2.3(d))	++	+	+
• Establish a vegetation monitoring system (3.1.1c(a))		++	+

++ Initiation of action

+ Continuation of action

Priority actions are in **bold**

It is felt that this approach is a useful basis for developing a future assessment system for Management Plan Implementation, but a major requirement is for SIF to develop annual work plans, with targets where appropriate, so that more specific information regarding progress can be demonstrated.

#### Assessment of Management Plan Implementation (2002)

A brief assessment of the present situation is shown in the tables which follow. They show that four years into the current Management Plan (1998-2005), 60% of the actions have reached at least the planning stage. Of these, 15% have been completed (or the policy or action has become part of normal management practice), and 17% have made substantial progress in all areas. 40% of actions have not yet commenced or response to the action has been ad hoc rather than to a set plan.

Positive progress can therefore be reported, with some major actions in the Administration category having been completed. Areas in which actions have proceeded less than satisfactorily are Tourism, Research Promotion and certain Policy Developments (particularly with respect to Finance). Lack of progress on some actions may be due to the difficulty of allocating extra staff time or Management Committee time because there are other pressing management needs. This is acknowledged as an area of concern.

Bearing in mind that this current World Heritage evaluation will lead to additional actions for implementation, the following list is suggested for future assessments:

1. Administration
  - a. SIF Annual General Meeting
  - b. SIF on Mahé (HQ)
  - c. SIF on Aldabra
  - d. Communications
2. Policy Development and planning
3. Finance and budget
4. Staffing
5. Infrastructure
  - a. Station
  - b. Camps
  - c. Cultural heritage
6. Research
7. Monitoring
8. Environmental Protection Measures
  - a. Patrols
  - b. Alien species
  - c. Other
9. Tourism and visitor management

#### **GAPS**

- **Absence of annual work plans.**
- **Absence of a quantitative reporting system (database) for progress on implementation of the Management Plan.**

#### **RECOMMENDATIONS**

- **Somehow find/allocate time for planning for the future** (it may be necessary to look into staffing issues and Management Committee issues, as well as time management issues)
- **Develop annual work plans for Aldabra** (including targets where appropriate)
- **Set up a system for annual assessment of progress on implementation of the Management Plan** (a possible method is shown in the database on the next page, but it will need reviewing).

## Summary Assessment of Current Management Plan Implementation

Management actions summarized below are those taken from the "Management Strategy and Action Plan" in the Management Plan for Aldabra.

Management action	Status of action 1 - 7	Status 1/2	Status 3-5	Status 6/7
1. Administration		62%	23%	15%
a. SIF Annual General Meeting (2 actions)	3,5			
b. SIF on Mahé (5 actions)	3,1,2,2,7			
c. SIF on Aldabra (6 actions)	1,1,1,1,2,6			
2. Policy Development (8 actions)	6,1,5,1,1,7,7,6	38%	12%	15%
3. Finance (3 actions)	6,6,2	33%	-	67%
4. Staffing (7 actions)	2,6,2,3,2,6,6	43%	14%	43%
5. Tourism (6 actions)	7,2,7,7,7,7	17%	-	83%
6. Research (7 actions)	6,6,3,6,5,5,5	-	57%	43%
7. Monitoring (4 actions)	5,3,3,7	-	75%	25%
8. Environmental Protection mechanisms (11 actions)	1,2,6,5,3,5,2,3,7,7,6	27%	36%	36%

**Note** - Status Codes are as follows:

1. Action has been completed or policy is in place and adhered to.
2. Action is making substantial progress in all areas.
3. Some work has commenced in all or some areas.
4. Policy and/or planning stages are complete but have not been implemented.
5. Planning is in progress.
6. Work is only reactive and not to a set plan.
7. Action has not commenced.

### Percentage of actions at the various status codes

1	2	3	4	5	6	7
15%	17%	14%	0%	14%	22%	18%
<b>60%</b>					<b>40%</b>	

## COMMENTS ON USE OF WORKBOOK METHODOLOGY

**Note that the Management Plan Implementation Database was omitted completely by mistake in the original assessment, and was not therefore reviewed by the Management Board at the AGM. It is presented here for the first time.**

The assessment of each action was carried out with the help of management.

The Status Code categories may be a bit sophisticated for SIF use or have slightly different meanings. It was found difficult to assess the status code of some actions because of the implications for staff time and fund allocation, so that in the end it proved easier to ignore the words in brackets (given in the descriptions on page 59 of Book 2 of the Toolkit). The main reason for this is that within SIF there has often been little option to actually allocate staff time – things have to be fitted in when possible. Stages 3 and 4 are often almost the same, in that planning and implementation are done more or less at the same time. This reveals that planning for implementation has often been on an ad hoc basis!

## OUTPUT ASSESSMENT

### WORK / SITE OUTPUT INDICATORS

Monthly reports and annual reports from management and research staff on Aldabra currently give some indication of outputs, but these are mostly descriptive rather than specifically quantified (see examples given below). There is currently no system of annual work programme targets for Aldabra. It has been necessary, therefore, to devise some appropriate indicators for the site.

The Performance Indicators suggested on the next page will need to be refined in the light of further developments in management strategy resulting from the World Heritage assessment. They will need to be selected according to the following criteria:

- They reflect the overall objectives for Aldabra,
- They involve considerable management time and/or expense,
- They are specific, measurable and consistent,
- They become part of the annual reporting requirements (if they are not already).

It will also be necessary to create tables or some other format for recording output indicators annually.

#### **GAP**

- **Absence of Annual Work Plans for Aldabra, including targets for work output. These would help to define Output Indicators that are measurable.**

#### **RECOMMENDATION**

- **Devise an Annual Work Plan for Aldabra (and for HQ) for 2003.**
- **Review the suggested Performance Indicators given on the next page, set up a system for recording results, and trial them during 2003.**

## SUGGESTED OUTPUT PERFORMANCE INDICATORS

These proposed indicators are grouped according to the four major policies for Aldabra, followed by other relevant management areas. They are based to some extent on what is being reported on a regular basis already, together with additional indicators.

### 1. PROTECTION AND CONSERVATION

- Numbers of illegal boats/ships seen around Aldabra or in the lagoon - details + action taken.
- Numbers of yachts visiting without advance permission from SIF - details + reason for attempted visit/stay + action taken.
- Number of patrol boat trips per month.
- Number of major infringements of Aldabra protection policy (see Operations Manual) - details + action taken.
- Number of major infringements of zonation policy - details + action taken.
- Outcomes of any prosecutions. (see example 1 below)
- **Conservation** - once Biodiversity Health monitoring programmes for all Focal Management Targets are decided (part of the Outcomes Assessment), then the performance indicator will be whether these programmes have been monitored fully and all analyses carried out (e.g. whether ALL tortoise transects are done each year + their analysis for various purposes).

### 2. RESEARCH AND MONITORING

- Number of significant research projects + state of progress - details + time spent on Aldabra + relevance to management (on a scale of 1 to 3) + whether report received.
- Number of visiting scientific individuals or groups - details + time spent on Aldabra + relevance to management + whether report received if appropriate. (see example 2 below)
- Amount of staff time spent on each of the monitoring programmes. (see Conservation above)

### 3. RESTORATION

- Numbers of specific alien species killed (e.g. goats shot, cats shot or trapped, rats trapped) + details.
- Areas of specific alien plant species cleared (e.g. sisal, 'zepi ble') + details.

**GAP:** At present SIF has no detailed restoration policy for Aldabra. The creation of such a policy might highlight other useful indicators.

### 4. EDUCATION

- Numbers of film crews/journalists/etc. visiting + details + time spent on Aldabra + whether copies of film or articles received.
- Number of tourists on educational visits + details + time spent on Aldabra.
- Number of Seychellois on educational visits + details + time spent on Aldabra.
- Number of local staff undergoing training + details + length of training.
- Percentage of targets met for newsletter production, website updates, media items, new publications, etc.
- Level of visitor satisfaction.

## 5. ADMINISTRATION

- Number and level of staff on Aldabra and on Mahé.
- Number of Aldabra staff changeovers + length of stay.
- Number of staff exchanges (e.g. rangers) with Government or partner organisations + details + length of stay.
- Percentage of required reports written and circulated within SIF.
- Extent to which budget expenditure is within defined acceptable limits.

Note: these indicators are mostly linked with the Input Assessment.

## 6. SITE MANAGEMENT

- Percentage of targets met for maintenance of Research Station facilities.
- Percentage of targets met for maintenance of Camp facilities and Trails.
- Percentage of targets met for maintenance of cultural sites (buildings, etc.).
- Amounts of natural resources used/stored for subsistence needs (e.g. water, fish, coconuts, mangrove poles, sand).

Note: Would it be worth recording personnel figures such as numbers of accidents, illnesses, conflicts, to help monitor the human situation on Aldabra?

### Examples of output indicators already being reported from Aldabra

1. In 2002, SIF successfully prosecuted a case involving the poaching of around 10 baby giant tortoises on Aldabra in December 1998. A former SIF field worker and a former employee on board a charter boat were each fined R1,000. This was the maximum fine under legislation in force at the time of the offence.
2. Scientific visits of note (partial list only):
  - Feb. 2001, staff from Shoals of Capricorn visited to conduct marine studies (+ list of 7 participants),
  - March 2001, Dr Jeanne Mortimer, international turtle expert, sea turtle ecology studies,
  - Nov. 2001, Dr Gerard Rocamora, Seychelles government ornithologist, visited to collect Aldabra Turtle Dove DNA samples,
  - Dec. 2001, Mr Bernard Devaux, Village de Tortues (SOPTOM) and Miss Sally Cersosimo, herpetologist, Atlanta Zoo, giant tortoise studies.
3. Educational visits of note:
  - May 2001, Ms Jeannette Larue and Mrs Susanne Charles, Ministry of Education accompanied visiting school children.

# OUTCOMES ASSESSMENT

## BIODIVERSITY HEALTH ASSESSMENT

It should be noted that the major goal of management is to protect and conserve the existing excellent natural ecological situation of Aldabra. Many of the factors (threats) affecting Aldabra are out of management control. As a result, it was felt that the “Acceptable Range of Variation or Acceptable State” of the various Focal Management Targets was not easily applied because most Targets already have a Very Good status. For those targets that only have a Good status, the intention of management is often that natural processes of recovery should be allowed to operate. So instead, a different measure of variation was used - “Indicators of Key Changes to the Focal Management Target” by which it would be possible to perceive any deterioration of the Focal Management Target. However, it is true that there are some Focal Management Targets where management actions could have a significant impact on a recovery processes.

Some of the proposed monitoring methods are still open to debate, because within the Seychelles there is a lack of technical expertise and also there is no institute of higher learning (such as a university) and no proper research institute. Links will have to be made with suitable institutions in order to improve this situation.

The main biodiversity assessment tables give an indication of the value of current monitoring and highlight some serious gaps where new monitoring programmes will need to be introduced (most of these are underlined in the tables). It should be noted that the current Coccid monitoring programme has been omitted from the tables because it has become of questionable value and perhaps should be discontinued, unless there are significant signs of further deterioration of the plant species affected or new species become affected.

The Monitoring Plan Template Table is very incomplete because there are many gaps to fill with respect to proposed monitoring techniques and financing of the programmes.

**Note:** The importance of Aldabra is as a natural ecosystem with which to compare others. Therefore if important changes that are out of management control (e.g. rainfall, temperature, sea level rise) occur on Aldabra, the atoll can be used as a “control” site, with respect to measuring the effects of these changes in other areas of the world.

### GAPS

- **There is a lack of information on most marine and some coastal habitats on the atoll.**
- **Vegetation monitoring is insufficient to use as a proper base for decision-making.**
- **There remains a lack of expertise on the most suitable monitoring techniques for the atoll.**
- **There is no well-defined policy on restoration of Aldabra habitats that may be affected for example by the presence of alien species.**

### RECOMMENDATIONS

- **Some assistance may be required in prioritising proposed monitoring programmes.**
- **Major assistance is needed to set up and finance monitoring programmes, particularly for:**
  - **Marine monitoring**
  - **Long-term monitoring of changes related to climate change.**
- **Links should be made with organisations and agencies that could assist with this.**
- **Devise a policy on climate change in relation to Aldabra:** A policy statement is required if Aldabra is to be monitored as a natural site (‘living laboratory’) where climate change is allowed to have its full effects. Otherwise a policy statement should state to what extent management would go to mitigate the effects of climate change on the atoll, e.g. coral reef restoration.

- **There is a need for capacity building in scientific monitoring within SIF.**
- **The staffing implications and financial implications of an increased monitoring programme must be properly assessed.**
- **There should be a complete review of the environmental conditions and ecological state of Aldabra over the last 23 years, since the management came into the hands of Seychelles Islands Foundation.**

## Biodiversity Health Outcomes Data Sheets

### Focal Management Target: Giant tortoise population

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Size	Population has been recovering since c.1870 on Grande Terre, and since some time later on Picard and Malabar. Natural recovery process is ongoing. ( <i>Bourn et al. 1997</i> )	Currently numbers tend to be density dependent. 1997 figures: Grande Terre 94,000, decreasing; Malabar 4,000, increasing; Picard 2,000, increasing. Preferred state - more stable populations on all three islands, at highest theoretical carrying capacity. Warning sign: persistent downward trend in population.	Regular tortoise transects + <u>analysis of data to show population trends</u> ; ?periodic census (20-40 years)?	Y	-	N	GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Condition	Population structure: Proportion of males/ females/unsexed + recruitment + mortality	Warning signs for changing conditions: Any major change from current island population structure figures; Absence or paucity of recruits; Increase in mortality rate.	Regular tortoise transects + <u>regular analysis of population structure</u> (size classes, sex, recruits, deaths)	y	-	Y? (ex. GT)	GOOD
	Size of individuals	Depends on growth rate - currently largest tortoises are found on Malabar, smallest at S.E. Grande Terre. Preferred state = increased size of Grande Terre individuals.	Regular tortoise transects (third scute width + <u>analysis of growth rate</u> )	y	-	y (ex. GT)	
	Nesting sites (soil of at least 25cm depth + some shade)	No exact records of extent of areas. Shortage of nest sites will affect recruitment. = GAP	<u>Incidental recording of flooding or other changes in known nest sites.</u>	y	-	y	

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
	Minimum competition from goats	Preferred status = total eradication of goats from Aldabra. Failing eradication on Grande Terre, continued opportunistic culling of goats will be necessary.	Monitor all sightings + number of individuals seen. Record all goats killed.	y	-	y (ex. GT)	
Landscape Context	Sufficient suitable vegetation to provide food and shade.	Warning signs: Major changes in vegetation cover, e.g, tortoise turf, <i>Sporobolus</i> grass, open and closed mixed scrub, spread of non-food species; Major loss of shade trees/shrubs.	<u>Assessment of changes to vegetation distribution since 1960</u> (using aerial photos and new GIS information); <u>Resampling of vegetation transects in S.E. Grande Terre in rainy season.</u>	y	-	y	GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
	Rainfall (affecting primary productivity and availability of drinking water)	Rainfall is critical for the survival of both vegetation and tortoises. Protracted periods of below average rainfall, or extended dry seasons, will have cumulative and potentially catastrophic impacts.	Regular monthly rainfall data throughout the atoll. <u>Highlight any major deviations from long-term means.</u>	y	-	y	

**Focal Management Target: Terrestrial habitats**

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Size	The atoll has a fixed size and natural ecological processes are ongoing.	There is no likelihood of change in size of the terrestrial area (except through sea level rise).	None				
	Vegetation, and therefore habitat types, are affected by rainfall, dispersal, herbivory, alien species.	Cover by various vegetation types could change in area. Warning signs: noticeable expansion of e.g. casuarina, sisal, coconut areas; noticeable reduction in area of any specific vegetation type, especially Tortoise Turf and other herbaceous types.	<u>Aerial survey data, in conjunction with ground truthing and vegetation transects.</u> ?Monitoring of key species?	Y	-	Y	VERY GOOD
	Endemic taxa (especially fauna) rely ultimately on the state of the vegetation. (Rainfall is important).	Loss or reduction of minor habitats might result in loss of associated endemic species. Warning signs: significant reduction in population size of any vertebrate species.	Regular survey of key species, e.g. Aldabra rail (transects); butterflies; biennial bird nesting success rate survey.	Y	-	Y	VERY GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Condition	Vegetation, and therefore habitat quality, are related to rainfall, dispersal, pollination, herbivory, alien species.	Warning signs: major changes <u>within</u> a vegetation type (e.g. loss of key species within a habitat); noticeable increase in alien species population, e.g. rats; presence of new alien plant species, pest or disease. Land crabs play a key role.....	?Satellite imagery for primary productivity on Aldabra? Vegetation surveys of key habitats? Should we be monitoring land crabs? Incidental reporting of unusual disease, etc.	Y	Y?	N	GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
	Endemic faunal taxa are affected by rainfall, habitat types, food supply, alien competitors and predators.	Warning signs: Any detected decline or sudden increase in indigenous or endemic taxa resulting from e.g. vegetation / habitat degradation or removal of medicinal species; poor breeding success in key bird species; appearance of any new alien species (e.g. crazy ants) ? are there rapid assessment methods for inverts? Note that there are no rails on Grande Terre.	Reporting of any unusual sightings (that could be a new alien species). Should we be monitoring key bird species e.g. insectivore, fructivore, seed eater, predator? ?Key insect or other invert species? (e.g. leaf litter invertebrates, butterflies)	Y	-	Y	VERY GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Landscape Context	Rainfall is the major factor affecting terrestrial habitats. Dispersal/migration of all land species, given unfavorable conditions, is difficult because of the isolation of the atoll.	If there are changes in rainfall patterns, all habitats and species may be affected to some extent, but this is out of management control. The atoll should be big enough for normal dispersal, barring a major catastrophe affecting more or less the whole atoll.	Monthly rainfall measurements at all stations on Aldabra. <u>Analysis of GIS data.</u>	Y	-	Y	VERY GOOD

**Focal Management Target: Coastal / Intertidal habitats**

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Size	Geographical coverage of habitat types affected by sea level, salinity, weather patterns.	These factors are out of our control. <u>Satellite imagery (1999) of lagoon habitats needs ground-truthing, to give better baseline data for biotopes.</u>	<u>Aerial maps and GIS info - could be looked at regularly (biennially?)</u>	Y	-	Y	VERY GOOD
	Breeding turtle populations affected by numbers caught outside of Aldabra, beach availability, and predation by feral cats.	Numbers caught outside of Aldabra are out of our control. Number of nesting turtles hasn't reached maximum capacity yet. Warning signs: long-term trends over 5-10 years show decline rather than increase; loss of beaches through erosion.	Regular monitoring of nesting turtles + analysis of population trends. <u>Monitor beach area available for turtle nesting.</u>	Y	-	Y/N	GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
	Breeding seabirds affected by food availability and predation-free nest site availability (e.g. lagoon islets).	Most food is caught outside of Aldabra in the open sea and would reflect conditions there. Warning signs: reduction in area of mangrove; decreasing nesting success (this is difficult to measure because of the disturbance factor)	Occasional population surveys of breeding sea birds. <u>Initiate methods from the new locally produced Seabird Monitoring Handbook</u>	Y	-	Y	VERY GOOD
	Migrant birds affected by weather conditions, food supply	Numbers arriving reflect environmental conditions outside of Aldabra. Food supply on the atoll should remain OK if intertidal habitats OK.	Incidental observations ?possible inclusion in the African waterbird census programme (2x per year)	-	-	-	-
Condition and Landscape	All intertidal habitat types are affected by sea level, salinity, weather patterns.	Condition is mainly out of our control. Note: sea current patterns in the region are being monitored by NOAA.	<u>GAP: proper tide tables for Aldabra itself.</u> <u>Tide gauge and monitoring programme urgently needed.</u>	Y	-	Y	VERY GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
	Mangrove species distribution depends on substrate factors, salinity and sea level	Condition is out of our control (affects breeding seabirds)	<u>To be monitored as part of a general vegetation survey</u> - using satellite imagery, FIB (flying inflatable boat) and/or transects.	Y	-	Y	VERY GOOD
	Beaches affected by presence/absence of fringe vegetation, weather conditions, and sea current patterns.	Except for maintaining beach fringe vegetation if possible, these things are out of our control. Warning signs: severe erosion of any beaches (affects turtle nesting)	Monitoring of beach profiles ( <u>improved methodology needed</u> ).	Y	-	Y	GOOD (may be worsening)
	Lagoon islets affected by rainfall and presence/absence of rats	Condition is mostly out of our control, except for rats and maybe alien plant species	Incidental observation (and as part of vegetation monitoring?); <u>rat study and ?control programme</u> ; occasional seabird nesting surveys.	Y	-	Y	VERY GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
	Intertidal habitats such as mud flats affected by sea level, salinity, sea current patterns, substrate deposition.	Condition is out of our control (affects migratory waterbird feeding.	?mudflat changes monitored, e.g. using FIB (flying inflatable boat) - also useful for mangrove habitat changes.	Y	-	Y	VERY GOOD

**Focal Management Target: Aquatic habitats**

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Size	Marine habitats: Tide levels, salinity, sea temperature, weather patterns, sea current patterns	GAP! We do not know enough about the extent of different habitats, but they are natural. Warning signs: changes in distribution and size of specific habitat types, particularly coral reef; Factors are basically out of our control.	<u>Satellite imagery (1999)</u> <u>needs ground-truthing to give better baseline data;</u> then regularly updated every x years (and/or transects?) GAP: Should be monitoring more of the key factors. (See Intertidal Habitats for some proposals)	Y	-	Y	VERY GOOD
	Pools: Rainfall, evaporation rate, tide levels	Out of our control. Natural variation to be allowed.	Incidental observation + meteorology records	Y	-	Y	VERY GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Condition	Marine habitats: All the factors mentioned above under 'Size' + nutrient supply + larval supply + inter-action between habitats (especially coral reefs and the rest)	Coral reefs:- Warning signs: further coral bleaching events (GAP: a protocol is needed for follow-up action)	Aldabra Marine Programme currently measures coral recruitment annually; maybe should be <u>monitoring re-growth</u> as well; <u>perhaps set up regular monitoring of permanent transects in lagoon and inner reef, using COI regional methodology, with special protocol for Aldabra</u>	y	-	y (except coral reefs)	GOOD
		Fish diversity:- Warning signs: change in species diversity, distribution; changes in population age structure could be useful.	Aldabra Marine Programme currently monitors diversity. ?Fish otoliths sampled from regular subsistence fishing could be sent to SFA for analysis	y	-	y	VERY GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
		Seagrass communities:- Warning signs: changes in species distribution or biodiversity.	Growth of juvenile turtles?; Are there rapid assessment methods being used in the region?	Y	-	Y	PRESUMED VERY GOOD
		Marine mammals:- Out of our control, but warning sign could be lack of sightings or beachings	Incidental monitoring only? Maybe scope for more organized monitoring. NB 2002 cetacean study in region	-	-	-	UNKNOWN
	Pools: All the factors mentioned above under 'Size' + surrounding vegetation + bottom substrate	Out of our control Warning signs could be changes in individual pools, especially increase in salinity	Monitoring of representative pools of each of the 3/5 main types - e.g. depth, salinity, temperature, nutrient levels, surrounding vegetation, bottom substrate, key species?	Y	-	Y	VERY GOOD

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)]  Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement  ( <u>underlined are proposed indicators</u> )	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Landscape Context	Marine habitats: All the above + Population levels of organisms outside of Aldabra; tidal flows in and out of the lagoon	Out of our control - reflecting climate change An interesting research project might be looking at productivity outside lagoon and inside lagoon (unusual because of high bird faecal deposition)	Sea temperature loggers; maybe need CTD (conductivity /temperature/depth) monitoring; ?internet/satellite info. on regional current speeds, sea temp., sea level, plankton levels; but would need ground-truthing, and would only be useful as an overview; ?tidal flow?	-	-	-	Assumed GOOD / VERY GOOD
	Pools: Underground connections through the porous limestone	Out of our control - reflecting climate change		-	-	-	Assumed GOOD / VERY GOOD

## Biodiversity Health Summary for Aldabra

Focal Management Target	Size rating	Condition rating	Landscape context rating	Overall Biodiversity Health Rating
Giant tortoise population	Good	Good	Good	Good
Terrestrial habitats	Very good	Good	Very good	Very good
Coastal / Intertidal habitats	Very good, except turtles, which are good (improving)	Very good, except beaches, which may be worsening		Very good (with the exception of turtles and beaches)
Aquatic habitats	Very good	Very good, except coral reefs which have been affected by coral bleaching	Assumed to be Good or Very Good at present (but another El Nino event is forecast)	Probably Very good (except coral reefs)

## MONITORING PLAN TEMPLATE (tentative only)

Focal Management Target	Indicator to be Measured	Key Factor / Biodiversity Health Category Informed	Methods to be Employed	Frequency	Timing	Who will Measure	Cost	Funding Source
Giant tortoise population	Tortoise transects	Population structure and trends, growth rates, etc.	Transect sampling (x12) + measuring	1 x month	Before 9am	SIF rangers		SIF
	Flooding or other changes	Nest site changes	Incidental recording	-	-	SIF rangers		SIF
	Goat numbers	Competition	Sightings and goats killed	-	-	SIF staff		SIF until larger project
	Vegetation changes	Sufficient food and shade	Vegetation transects					
	Rainfall	Primary productivity	13 rain gauges	1 x month	-	SIF staff		SIF
Terrestrial habitats	Vegetation area changes	Vegetation cover	Aerial maps + ground truthing					

Focal Management Target	Indicator to be Measured	Key Factor / Biodiversity Health Category Informed	Methods to be Employed	Frequency	Timing	Who will Measure	Cost	Funding Source
	Key species	Endemic taxa integrity	Regular surveys of key species (which ones still to be decided)	Rails: 1 x month, Butterflies 1 x week, Bird nesting, etc.	Rails after 4pm,	SIF rangers		SIF
	Alien species	Ecosystem integrity	To be decided					
	Rainfall	Primary productivity	13 rain gauges	1 x month	-	SIF staff		SIF
Coastal / Intertidal habitats	Lagoon intertidal habitat areas	Vegetation cover/ ecosystem integrity	Aerial maps + ground truthing + vegetation transects					
	Key data relating to the sea	Changing habitat conditions	Tide gauges, salinity and temperature					
	Turtle nesting	Turtle population trends	Beach track counts + tagging	1 x month + 4 x month for some	Tracks: am, Tagging: night	SIF rangers		SIF

Focal Management Target	Indicator to be Measured	Key Factor / Biodiversity Health Category Informed	Methods to be Employed	Frequency	Timing	Who will Measure	Cost	Funding Source
	Beach area	Turtle nest sites, habitat integrity	Beach area & profiles			SIF rangers		SIF
	Juvenile turtles	Turtle population trends and growth rates	Tagging and measuring			SIF rangers		SIF
	Sea birds	Population trends	Population survey of breeding birds	Occasional				
	Migrant birds	Population trends?	To be decided					
Aquatic habitats	Aquatic habitat areas	Ecosystem changes	Aerial maps + ground truthing + transects					
	Coral reefs	Changes in coral reef ecology	Coral recruitment, others to be decided	1 x year		Aldabra Marine Programme + SIF		

<b>Focal Management Target</b>	<b>Indicator to be Measured</b>	<b>Key Factor / Biodiversity Health Category Informed</b>	<b>Methods to be Employed</b>	<b>Frequency</b>	<b>Timing</b>	<b>Who will Measure</b>	<b>Cost</b>	<b>Funding Source</b>
	Fish diversity	Ecological changes	Coral reef fish diversity, fish catches + fish otoliths?			Aldabra Marine Programme + SIF		
	Seagrass community	Ecological changes	To be decided					
	Marine mammals	Ecosystem changes	To be decided	Incidental?				
	Key data relating to the sea	Changing habitat conditions	Tide gauge, salinity and temperature (CTD)					
	Significant characteristics of pools	Inland pool ecological changes	To be decided					

# OUTCOMES ASSESSMENT

## ASSESSMENT OF THREAT STATUS

### Current Threats

Stresses are defined as the types of destruction or degradation affecting conservation targets. Two current stresses have been identified:

1. Interruption to ecological processes
2. Disturbance to or loss of habitats, species and species integrity.

Aldabra is unique in that it is an entire ecosystem isolated from almost all human contact. It has no native population that exploits its resources and the nearest neighbouring island is Assumption, some 35 kilometres away. Assumption has a tiny population of contract workers who have no land rights and other than logistic support have no influence on Aldabra.

The atoll is therefore not subject to the threats encountered on continental World Heritage sites with common boundaries, neighbours and pastoralists using the site. The threats to Aldabra are those which endanger its ecological processes and the natural environment. The source of these threats lies to a great extent beyond the control of Seychelles Islands Foundation. The major threat comes from an assumed change of climate driven by global warming. While it is possible to make basic models to predict the impact, there are too many variables to make this a management prospect. It would, in the long run, be wiser to continue to manage Aldabra as a site where all ecological processes are allowed to proceed without intervention, even if these processes are driven by human induced climate change caused elsewhere.

### Stress ranking

The ranking related to the threat from climate change is based on those factors of which we are currently aware. Firstly, beach erosion appears to be occurring in many areas. This could be cyclical, but is in any case being monitored. It poses a potentially serious threat to turtle nesting beaches. Secondly, the dry seasons appear to be increasing in severity and length, which will have an impact on vegetation and consequently on the giant tortoise population and all other taxa. Thirdly, a major coral bleaching event (1997/1998) has destroyed much of the coral in the Indian Ocean, including Aldabra's reefs. Although there has been some regeneration, further damage has been reported in 2002.

The ranking of the stress "**Interruption to Ecological Processes**" is considered **high** because phenomena related to climate change have seriously degraded the coral and are likely to have a severe impact on other focal management targets.

Stress ranking related to "**Disturbance to or Loss of Habitats etc.**" is considered **low** because there has been little discernible change recorded (except for coccid damage to plants) in the previous 30 years.

### Source of Stress Ranking

Based on the assumption that **climate change** is the primary source of current threats to the ecological processes and will be the main contributor to species and ecosystem loss, the source ranking is considered **high** for most Focal Management Targets.

Source ranking for **alien species** is considered **low to medium**. There is a lack of data for current impacts, some of which may not be so obvious.

**Human disturbance**, caused by poorly supervised visitors, research activities, poachers, dive boats and yachts, has only a localised impact but is considered a likely contributor. It is therefore ranked **low**.

### Potential threats

Potential threats are defined as those stresses on the horizon that are pending, but not currently taking place. The potential stresses identified are similar to current stresses but viewed as a longer-term threat.

In addition to **climate change**, which has been discussed above and is given a **high** ranking, there are **human induced threats**:

- Unintentional introduction of additional **alien species**, including disease organisms, could have huge but unpredictable impacts, particularly on **terrestrial ecosystems**, and is thus given a **medium** ranking for that Focal Management Target. There is increased likelihood of new introductions with increased visitation and increased visitor access because there are so many possible ways of entry – through species being attached to clothing or shoes, ‘hitching a ride’ on a boat, in goods being unloaded from boats, import of vegetables or fruit - even if regulations are tightened. Also alien marine species can arrive on boat bottoms, in bilge water etc..
- The possibility of **fire** or a tanker **oil-spill** are not considered a threat to the entire atoll, as they are likely to be localised and the damage would not persist beyond the 10 year window being considered. Caveats: i. No data exists for Aldabra on fire damage or scrub recovery; ii. Recent evidence suggests that long-term effects of oil spills are more serious than originally expected.)
- **Tourism**, if expanded to include residential accommodation on Aldabra, could have significant impacts in certain areas.
- Also considered are possible impacts on historical heritage due to a variety of factors.

### RECOMMENDATIONS

Gaps and recommendations have been considered in the section on Stresses and Threats in the Context Review.

It is difficult to manage for the unpredictable effects of climate change. However, other threats can be managed to some degree (alien species, human disturbance) - avoided if possible by appropriate actions, and limited through special contingency plans. **It will be necessary to concentrate on those threats that management CAN do something about through appropriate action. But it will also be important not to neglect the monitoring of those effects that management can do little about, so that Aldabra can act as a “living laboratory” for the world.**

Fire and oil spill risks are both addressed to some extent in the Aldabra Management Plan 1998-2005. However, even if there is a low probability of a tanker oil-spill, such an event could cause extensive damage to coastal and marine habitats, depending on the amount of oil, the distance from Aldabra, the wind direction, etc.. Improving defensive actions and contingency plans should be a priority.

Action on current aliens is a priority but it is important to introduce further preventive actions to reduced the risk of new introductions. It is also necessary to devise contingency plans in case of a new introduction.

## Ranking stresses and sources of stress worksheet

### Focal Management Target: Giant Tortoise Population

Stresses	Interruption to ecological processes		Disturbance to/loss of habitats, ecosystems, etc.		Justification	Overall Threat Rank to Target
Stress rank	High		Low			
Source of Stresses	Source rank	Stress / Source rank	Source rank	Stress / Source rank		
Climate change	Medium	Medium	Low	-	Increasing drought reduces food resources and shade. Loss of habitat due to over-grazing.	Low
Alien species	Low	Low	Low	-	Competition with goats for food resources. Reduced recruitment due to predation by cats.	Low
Human disturbance	Low	Low	Low	-	Humans have little impact on tortoises, but poaching of juveniles could upset the population structure.	Low

**Focal Management Target: Terrestrial Habitats**

Stresses	Interruption to ecological processes		Disturbance to or loss of habitats, ecosystems etc.		Justification	Overall Threat Rank to Target
Stress rank	High		Low			
Source of Stresses	Source rank	Stress / Source rank	Source rank	Stress / Source rank		
Climate change	High	High	High	Low	Loss of species, habitats and eco-systems.	High
Alien species	Medium	Medium	Medium	Medium	Species integrity threatened. Changes in species composition.	Medium
Human disturbance	Low	Low	Low	Low	Disturbance and damage to vegetation during visits or research. Introduction of new alien spp.	Low

**Focal Management Target: Coastal / Inter-Tidal Habitats**

Stresses	Interruption to ecological processes		Disturbance to or loss of habitats, ecosystems etc.			
Stress rank	High		Low			Overall Threat Rank to Target
Source of Stresses	Source rank	Stress / Source rank	Source rank	Stress / Source rank	Justification	
Climate change	High	High	High	Low	Loss of turtle nesting beaches, islets and shore bird feeding grounds.	High
Alien species	Low	Low	Low	-	Threats to species composition on islets and in mangrove.	Low
Human disturbance	Low	Low	Low	-	Damage to reef flats by human traffic. Disturbance by researchers on islets to timid taxa.	Low

**Focal Management Target: Aquatic Habitats**

Stresses	Interruption to ecological processes		Disturbance to or loss of habitats, ecosystems etc.		Justification	Overall Threat Rank to Target
Stress rank	High		Low			
Source of Stresses	Source rank	Stress / Source rank	Source rank	Stress / Source rank		
Climate change	High	High	High	Low	Severe damage to corals & reef integrity. Loss of turtle & bird feeding grounds.	High
Alien species	Low	Low	Low	-		Low
Human disturbance	Low	Low	Low	-	Damage to coral from boat anchor chains (localised).	Low

**Focal Management Target: Other Natural Values**

Stresses	Interruption to ecological processes		Disturbance to or loss of habitats, ecosystems etc.			Overall Threat Rank to Target
Stress rank	High		Low			
Source of Stresses	Source rank	Stress / Source rank	Source rank	Stress / Source rank	Justification	
Climate change	High	High	High	Low	Some erosion of edge of atoll recorded.	High
Alien species	Low	Low	Low	Low	Integrity threatened by alien species.	Low
Human disturbance	Low	Low	Low	-		Low

**Focal Management Target: Cultural/Social values - Relics of old human settlement**

Stresses	Interruption to ecological processes		Disturbance to or loss of habitats, ecosystems etc.			Overall Threat Rank to Target
Stress rank	Low		Low			
Source of Stresses	Source rank	Stress / Source rank	Source rank	Stress / Source rank	Justification	
Climate change	High	Low			Erosion threatening station buildings, old settlement & cemetery.	Medium
Alien species						
Human disturbance			Medium	Medium	Neglect of cultural heritage could result in collapse and loss of structures.	Low

**Current Threat-to-Target Summary Table**

<b>Sources of Current Threats</b>	<i>Giant tortoise population</i>	Terrestria l habitats	Coastal / Intertidal habitats	Aquatic habitats	Other natural values	Relics of human settle-ment	<b>Overall Threat Rank to Targets and Site</b>
Climate change	Low	High	High	High	High	Medium	Very high
Alien species	Low	Medium	Low	Low	Low	-	Medium
Human disturbance	Low	Low	Low	Low	Low	Low	Low
Overall Threat Rank for Site	Medium	High	High	High	High	Medium	Very high

## Identification and Ranking of Potential Threats

<b>Focal Management Target</b>	Interruption to ecological processes etc. caused by climate change	Disturbance due to tourism, trail cutting, etc	Disturbance caused by alien species	Disturbance caused by oil spill pollution	Loss of natural / cultural heritage due to fire, theft, poaching or cyclone
Giant Tortoises	High	Low	Low	Low	Low
Terrestrial habitats	High	Medium	Medium/High	Low	Low
Coastal/Inter-tidal habitats	High	Low	Low	Medium	Low
Aquatic habitats	High	Low	Low	Medium	Low
Other natural values	High	Low	Low	Low	Low
Relics of old human settlement	-	-	-	Low	Medium

## OUTCOME ASSESSMENT

### ACHIEVEMENT OF MANAGEMENT OBJECTIVES

As mentioned in the Management Plan assessment in this report, management objectives are not clearly stated in any detail, and there was some confusion as to what objectives are to be included here and how to establish a monitoring system for their outcomes. So the first attempt at preparing the data table produced a set of objectives based on the four “Overall Goals and Objectives” in the Management Plan. The first of these goals and objectives deals with preservation and protection of Aldabra’s ecosystems, so clearly is covered in the Biodiversity Heath Assessment. The other three relate to research and monitoring, education and nature-conservation tourism, and increasing environmental awareness of staff.

The tables produced for these three objectives are included below, for reference. It is realized that some of the performance indicators are actually Outputs rather than Outcomes, e.g. number of staff talks to be shown in Warden’s annual report.

The choice of specific objectives and the completion of these tables is therefore to be considered a Gap in this assessment, and help may be needed to better understand what is to be measured.

Nevertheless, one of these objectives has been attempted again, in the light of further thought, and is also presented for comment, to see whether it is more along the lines of what is required.

#### **GAP**

- **The assessment has not been completed because of the current lack of clearly stated management objectives of the type required.**

#### **RECOMMENDATION**

- **Ensure that management objectives are in line with requirements for the evaluation process, then re-devise a monitoring system.**

## ACHIEVEMENT OF MANAGEMENT OBJECTIVES ASSESSMENT: DATA SHEET (first attempt)

(Social, cultural and other objectives)

**1. Plan Objective:** To advance and facilitate scientific research and monitoring  
**Plan**

- Increase level of scientific research

**Outcomes:**

- Sustain monitoring programmes
- Establish new monitoring programmes (as a result of this evaluation)

Performance assessment	Performance indicators	Data and methods of collection
Increase level of scientific research	Increased scientific interest and priority research projects, including research publications	Research projects and results to be presented in report by Executive Director to AGM
Sustain monitoring programmes	All existing monitoring to be shown in Research Officer reports and incorporated in Management Plan	Existing monitoring to be reported in full by Research Officer in annual report to AGM
New monitoring established by this assessment process	Priorities established pursuant to this assessment and procedure agreed by all staff	Management priorities monitored and reported to AGM by Executive Officer

**2. Plan Objective:** Purpose of tourism is conservation education

- Plan Outcomes:**
- Visitors' center
  - To present an informative display
  - To improve visitor experience
  - Conservation education
  - Preserve cultural features

<b>Performance assessment</b>	<b>Performance indicator</b>	<b>Data and method of collection</b>
Establish a permanent Visitors' Centre	Building in good condition with adequate facilities	State of Centre to be maintained and reported on annually to AGM by Warden
Information on display to be relevant to Aldabra	Displays with clear interpretation, and conservation bias established	Gather data on visitor appraisal by survey form for each group. Submit annual report to AGM by Warden and staff
Improve visitor experience	Staff trained to guide visitors and to explain natural history in a clear and friendly manner	Visitor survey after guided tour. Submit annual report to AGM by Warden
Conservation education	TV features and more easily understood publications	Increased awareness of conservation aims of Aldabra by Seychellois - how to assess?
Preserve cultural features	All cultural features up-graded and maintained. Some declared National Monuments	Survey buildings and plan restoration. Submit report on restoration progress by Warden. Formal request and acceptance by National Heritage Board

**3. Plan Objective:** Increase environmental awareness of Aldabra staff

- Plan Outcomes:**
- A conservation motivated staff
  - A better educated non-managerial staff

Performance assessment	Performance indicator	Data and method of collection
Staff aware of conservation objectives and their role	Regular talks by Warden, Research Officer and visiting scientists to raise awareness	Number of staff talks to be shown in Warden's annual report
Improved education of rangers and other staff	Rangers to have science or biology at minimum 'O'-level or above. Other staff encouraged to improve education level, follow courses. Enhance ranger exchange programme	CVs to be submitted before employment. Reports on all education improvements and ranger exchanges to form part of Executive Officer's annual report

## DATA SHEET (some other possibilities) (Social, cultural and other objectives)

### Possible Management Objectives

- Increase scientific research on and around Aldabra
- Improved quality of rangers and other Aldabra staff
- Improve visitor facilities and visitor experience\*
- Increase the number of Seychellois visiting Aldabra
- Obtain official recognition of the significance of cultural heritage
- Collection of information about former settlement on Aldabra
- Rehabilitation of relics of previous settlement

Then, taking as an example, one of the above\*:

**Management Objective:** Improved visitor facilities and visitor experience.

**Management Outcome:** By or before 2005, have a basic visitor center with educational material on display, a range of Aldabra souvenirs for sale, personnel trained as guides, and a visitor survey mechanism in place.

Performance assessment	Performance indicator	Data and method of collection
Visitor center to be prepared or erected	Visitor center physically in place and functioning	Photographs of building in use by visitors
Displays, with clear interpretation to be prepared	Extent of use by visitors?	Visitor survey of the displays
A range of souvenirs to be prepared and sent to Aldabra, (and Vallée de Mai and outlets on Mahé)	Aldabra postcards, T-shirts, books, etc. in place	Revenue collected from sale of souvenirs
Short-term local training for Aldabra personnel	Certificates and inclusion of information in skills register	Visitor survey of quality of guides
Visitor survey mechanism to be devised	System to be in place and used for each group of visitors	Results of visitor surveys to be included in Warden's reports

Please note that these are possibilities only and may not be appropriate in the real situation.

## GAPS, RECOMMENDATIONS AND CONCLUSIONS

The following points provide a summary of a) the main requirements for completion of the evaluation process, b) actions that have priority within the second year of the “Enhancing our Heritage” programme, c) recommendations for future larger-scale actions, and d) concluding overall remarks about the major aspects of Seychelles Islands Foundation Management that require change.

Note: Actions that may require assistance from the “Enhancing our Heritage” programme are marked thus: #

### GAPS

#### Data table gaps

There are certain data tables which are incomplete:

- Input Assessment, which may need additional estimates for inputs for planned management activities.
- Process Assessment, which needs the additional issues to be completed and rated according to criteria that are still to be determined.
- Outcomes Assessment – Achievement of Management Objectives, where the objectives need to be more clearly defined before performance indicators can be suggested.

**The completion of these data tables is a priority in Stage 2. #**

#### Gaps in knowledge base

- Management Committee and executive staff need to become more familiar with the contents of the Management Plan. = **priority**
- More information is required on vegetation, marine ecosystems (#) and some intertidal habitats.
- More information is needed on the impact of alien mammals, particularly rats, on terrestrial habitats. #
- Research on the history of previous settlement on the atoll is already underway.
- Inland water pools require re-surveying. #
- Lack of expertise with respect to certain types of monitoring. #

The latter points will need to be prioritized.

#### Management Gaps that can be filled within Stage 2 of the Enhancing our Heritage programme

- Time should be set aside (allocated) by management for planning and policy making activities, such as those below. = **priority**
- Capacity building for executive management staff (perhaps through the medium of an expert with a broad, flexible and creative approach). #
- Annual Work plans should be constructed for both SIF HQ and Aldabra, including targets, and budget / staffing allocations needed to meet those targets. All progress will then be easier to assess, through performance indicators.
- A better system should be devised for monitoring and reviewing the Management Plan.
- Contingency plans for a number of issues can be enhanced or devised, particularly oil spill, fire, emergency evacuation, scuba diving accidents, armed poachers, preventing new alien species arrival, and cyclone. These should be prioritized so that at least some are dealt with in Stage 2.
- The absence of a formal lease arrangement between government and SIF is already being followed up.
- Ensure communications at all levels are as efficient as possible.
- The next budget formulation should be done in conjunction with senior Aldabra staff.

## **RECOMMENDATIONS**

### **Longer term actions that are necessary and will need prioritizing**

- New Management Policies written for Finance, Tourism, Management/Administration (if required), Restoration of habitats and settlement relics, Climate change responses, Alien species (new introduction) responses. #
- Share management experiences with others who manage remote protected areas. #
- Further development of the whole Monitoring Programme on Aldabra. #
- Further develop the research programme on Aldabra. #
- Devise programmes for research and control of alien invasive species. #

## **CONCLUSIONS**

### **Major requirements**

1. ALDABRA NEEDS TO BECOME MORE FINANCIALLY SELF-SUSTAINING.
  - Alternative financing proposals will require thorough analysis before any decision is made.
2. THE WHOLE STRUCTURE OF SEYCHELLES ISLANDS FOUNDATION REQUIRES RE-THINKING IN A POSITIVE AND CREATIVE WAY.
  - In particular, the role of government within SIF should be re-assessed.
3. MANAGEMENT SYSTEMS AND PROCESSES MUST IMPROVE.
  - Management needs to become proactive rather than reactive, in particular towards major policy development, staffing, budget control, atoll management, and law enforcement.
  - Management will need to prioritise actions. (When the Process Assessment has been completed, this will become easier).
4. NEW FORMS OF PARTNERSHIP NEED TO BE DEVELOPED.
  - Current partnerships should be re-assessed and new partnerships should be fostered.
  - Stakeholder participation should be encouraged.
  - If more of the outer islands of the Aldabra group should become linked in some way, with more people and more facilities, there could be an opportunity for the development of partnerships.
  - Regional co-operation should be fostered in areas which benefit Aldabra.

# *Enhancing our* HERITAGE

monitoring and managing for success in natural world heritage sites



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