



## **RESEARCH OFFICER'S REPORT**

**AUGUST 2000 - FEBRUARY 2002**

**Anna Carina Liljevik**

March 2002

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## INTRODUCTION

This report aims to summarise the main aspects of the monitoring work and scientific studies carried out throughout my term as Research Officer on Aldabra Atoll and UNESCO World Heritage Site from August 2000 through February 2002. Opportunistic field observations made by the Aldabra monitoring team during the aforementioned period have also been documented in the report. Staff and administrative issues are discussed briefly where they relate to the scientific work on Aldabra.

## REPORT LAYOUT

The layout of the report follows more or less that of the previous annual research officer's report by Betts (1999-2000). To summarise, there are four main sections to this report:

- 1. Longterm Monitoring**
- 2. Other Research and Monitoring**
- 3. Conservation and Management**
- 4. Staff and Administration**

**(1) Longterm Monitoring** refers to the mandatory monitoring activities as outlined in the Aldabra Management Plan. These activities currently include tortoise transect counts, sea turtle track counts and tagging, recording of fish catch for subsistence purposes, rail transect counts, monitoring of coccid infestation levels, beach erosion studies along Settlement beach and the ongoing recording of rainfall. Other meteorological observations other than rainfall have also been included in this section, as it was thought more logical to include them here under the same heading.

**(2) Other Research and Monitoring** covers additional non-requisite monitoring work, scientific studies and opportunistic field observations that have not been specified as required work as such in the Aldabra Management plan, but have nonetheless been initiated by SIF staff and/or visiting scientists following the approval of the SIF Scientific Sub-committee.

**(3) Conservation and Management** includes a brief discussion pertaining to some of the main concerns in terms of both existing and potential threats to Aldabra Atoll as an intact ecosystem. Topics covered include cleanup activities, trail clearing and marking, wildlife poaching issues, introduced alien species, some of the currently identified potential anthropogenic threats (such as oil spills and fire hazards) to the atoll ecosystem, as well as a brief discussion addressing the need to enhance the until now somewhat neglected marine aspect of Aldabra Atoll.

**(4) Staff and Administration** addresses some of the main concerns in terms of recruitment needs of Aldabra monitoring staff as well as some logistical necessities required and requested by rangers for efficient monitoring work and their well-being (as expressed by those concerned and myself) on Aldabra Atoll. Other topics covered include some major assets acquired at Aldabra Station during my term as research officer, interactions with the scientific community (i.e. Scientific Workshop hosted by SIF), a brief critique of communication between Aldabra Station and SIF headquarters, as well as an update on the status of our library resources, and an account of the computerisation of collected data during my time here on Aldabra.

## **1. LONGTERM MONITORING**

### **1.1 Meteorological data recording**

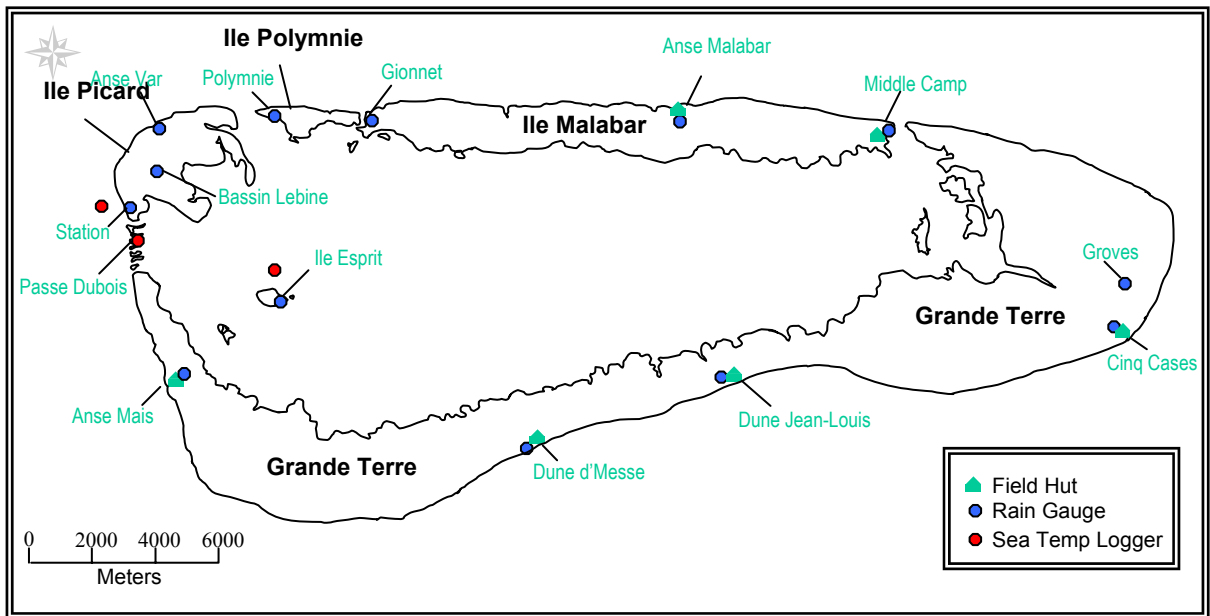
Physical environmental parameters recorded on a regular basis by Aldabra staff include rainfall, air temperature, duration of sunshine (subject to availability of sunshine cards), wind speed and wind direction. The data collected during the period of this report were summarised and forwarded every two months to the National Meteorological Services on Mahé, and also summarised and forwarded monthly or bi-monthly via e-mail to SIF in the Research Officer reports for further circulation to SIF board and Scientific Sub-Committee members.

In addition to the manual recordings, there is an automatic weather station located on Picard, which transfers climate data directly to the National Meteorological Services on Mahé.

Sea temperature loggers were installed by the Aldabra Marine Programme (AMP) group of marine scientists in February 2001. Two loggers (provided by AMP) were installed by Aldabra staff at Passe Dubois in February 2001 and near Ile Esprit inside the lagoon in April 2001 (Fig. 1).

#### **1.1.1 Rainfall**

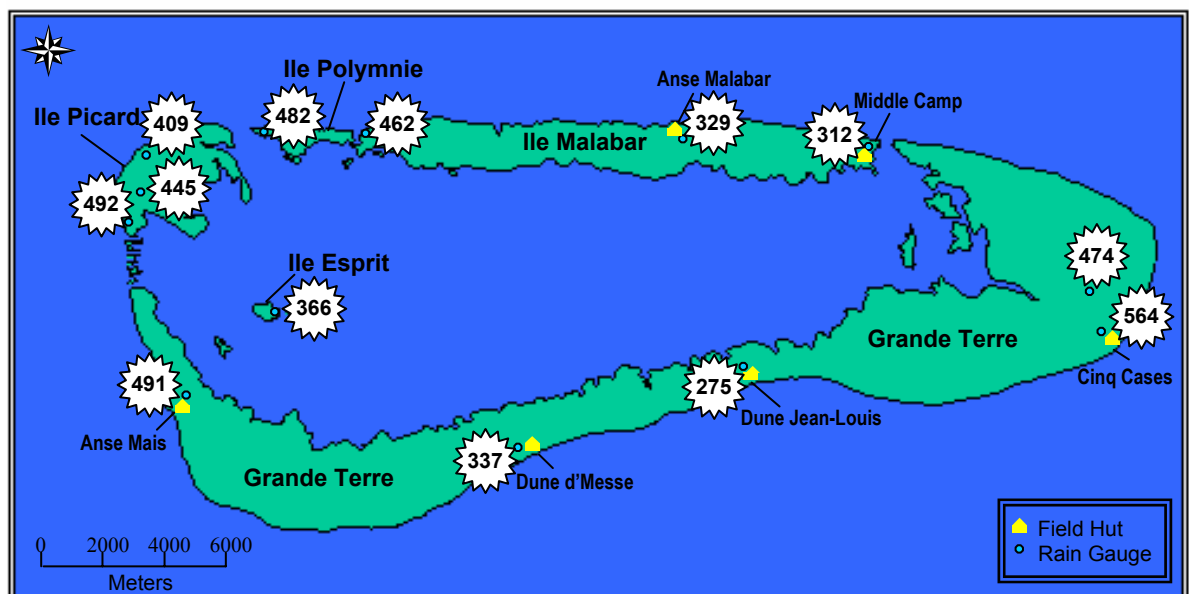
There are 13 rain gauges in total (Fig. 1) positioned around the atoll. Twelve of those were read and emptied on a monthly basis, while the one located at the Station was read and emptied daily. The Anse Var rain gauge, which holds a smaller volume than the other gauges, was emptied once per month during the dry season and more frequently during the rainy season.



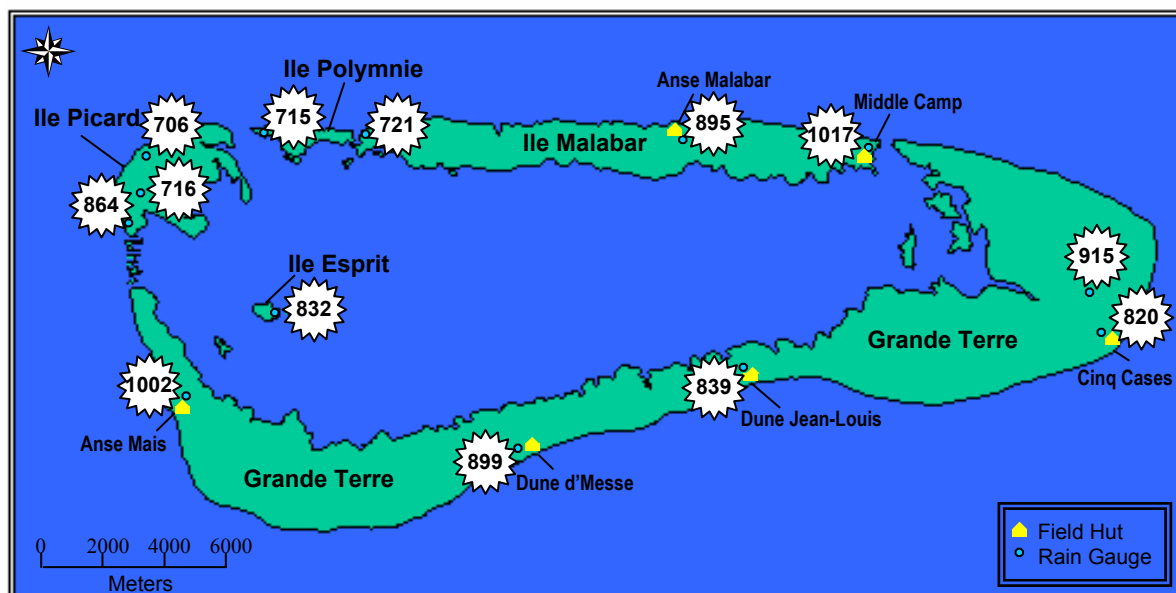
**Figure 1.** Location of rain gauges and sea temperature loggers monitored by SIF staff.

The rain data were entered onto record cards (on file in the Station library) and also computerised on the Station computers located in the Library Block. Monthly or bi-monthly summaries of data were presented in the Research Officer's reports and back-up copies of data have been forwarded to the Executive Director of SIF.

Monthly totals of rain data recorded during the period covered by this report are summarised in Appendix I, and the 2000 and 2001 rainfall totals for the various areas around the atoll have been presented below (Figs. 2-3).



**Figure 2.** Total annual rainfall recorded by region in the year 2000.



**Figure 3.** Total annual rainfall recorded by region in the year 2001.

The amount of annual rainfall recorded at the Station, located on Picard Island, during the period of this report was 492mm in 2000 and 864mm in 2001, respectively. In order to appreciate how these values compare to the past record of annual rainfall on the atoll, the mean rainfall has been calculated for those time periods where rainfall records were available and is presented in Table 1. The table format and 1949-1959 dataset are from Stoddart and Walsh (1979). The 1968-1984 data were obtained from ERGO/SIF (1997), whilst the 1994-2001 records are from Aldabra Station data archives.

It should be noted that there are some large gaps in data recording during the period 1949-2001, most notably prior to 1968 when the number of observations were few and also during the period 1985-1992 for which there are no records available at all according to ERGO/SIF (1997) and 1993, which is also incomplete. Searching through the records available at the Station I have only been able to find original rainfall records for the data collected in 1994-2001.

Similar to Stoddart and Walsh (1979), a mean annual rainfall was calculated from monthly means for the 17-year period between 1968 and 1984, as well as the 8-year record between 1994 and 2001 (Table 1). An annual mean was also calculated for the entire data set, yielding a mean annual rainfall of 1024mm for Aldabra Station. This figure is indicated by a dotted line (Figure 4) superimposed onto the annual rainfall records available from 1949 to present. Recent records show that rainfall was below average in both 1995 and 1996, and also over the last three years 1999-2001. The year 2000 was particularly dry with a total rainfall of only 492mm. The implications for the atoll's flora and fauna could be significant and warrant serious consideration in terms of their future and conservation.

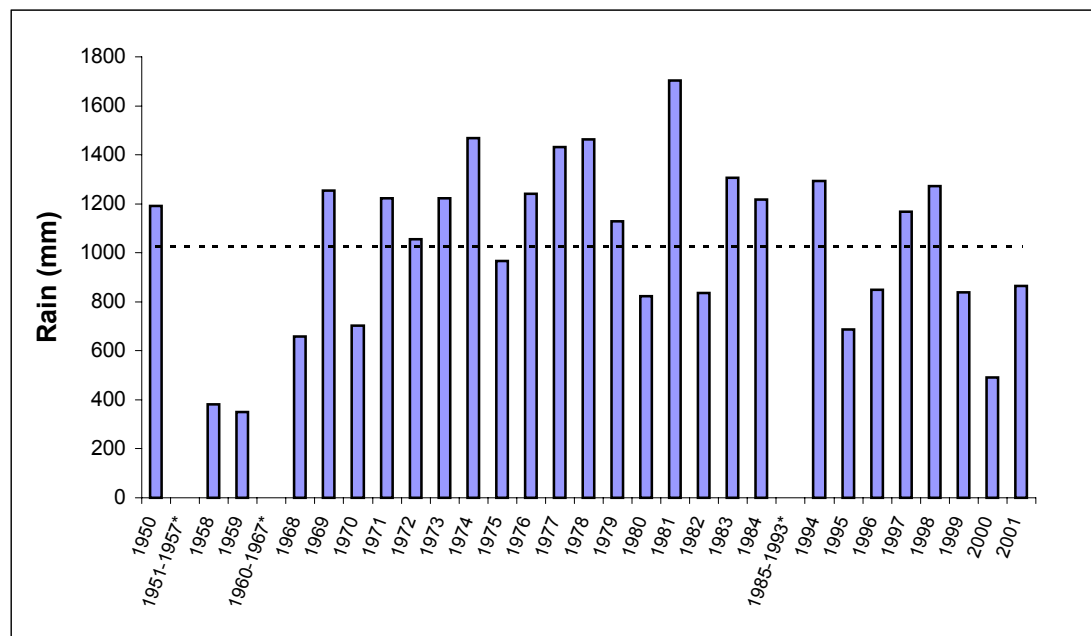


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual*
<b>1949-1959</b>	108	177	110	141	16	14	9	10	9	4	34	44	677
n1	5	5	5	6	6	6	6	6	5	5	5	4	
<b>1968-1984</b>	218	109	194	146	70	53	46	26	12	25	88	172	1159
n2	17	17	17	17	17	17	17	17	17	17	17	17	
<b>1994-2001</b>	169	130	194	75	40	35	24	17	6	46	38	158	933
n3	8	8	8	8	8	8	8	8	8	8	8	8	
<b>1949-2001</b>	186	126	180	127	52	41	33	21	10	27	71	151	1024
n1+n2+n3	30	30	30	31	31	31	31	31	30	30	30	29	

\* indicates annual rainfall calculated from monthly means over the time period

n is the number of observations during the time period

**Table 1.** Mean annual rainfall recorded at Aldabra Station on Picard Island in 1949-1959, 1968-1984 and 1994-2001.



--- annual mean based on all records available

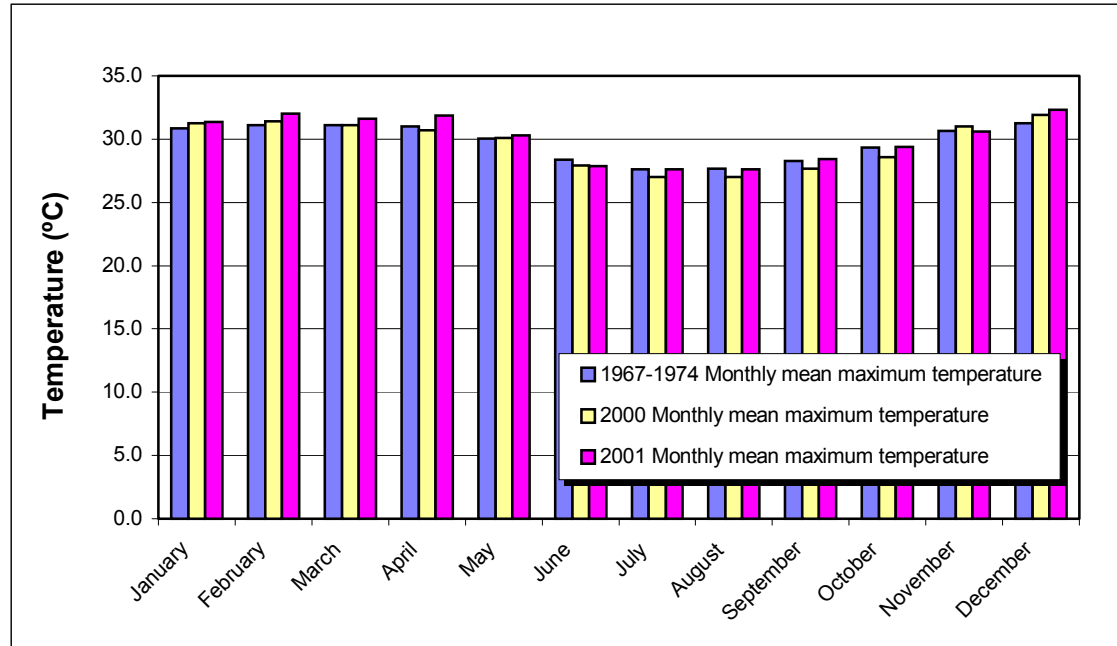
\* discontinuous data or records not available

**Figure 4.** Total annual rainfall recorded at Aldabra Station 1949-2001  
1949-1984 dataset obtained from *Aldabra revisited* (ERGO 1997)  
1994-2001 dataset obtained from Station records on Aldabra

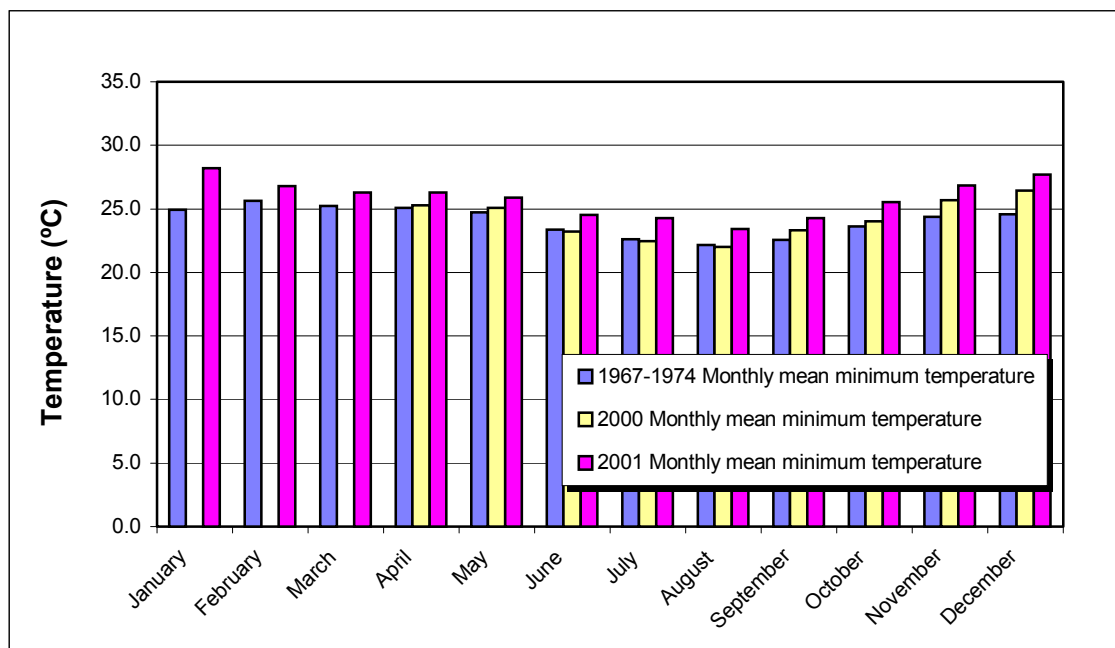
### 1.1.2 Air temperature

Air temperature was read daily at 0400hrs GMT from the thermometers located in the Stevenson Screen at the Station on Picard Island. The data collected include readings from a dry bulb thermometer, a wet bulb thermometer, a maximum temperature thermometer and a minimum temperature thermometer. Maximum and minimum thermometers were reset every 24 hours at the time readings were carried out (i.e. 0400hrs GMT). All data collected were computerised (Appendix II), with copies forwarded to the Meteorological Office on Mahé. Original copies of the data sheets are filed in the Station Library in a ring binder labelled "Meteorological Data".

A comparison between the 1967-1974 dataset presented by Stoddart and Mole (1977) and the mean maximum and minimum monthly temperatures recorded at Aldabra Station by SIF staff in 2000-2001 are shown in Figures 5 and 6, respectively.



**Figure 5.** Mean maximum monthly air temperatures recorded at Aldabra Station in 2000-2001 in comparison to the mean maximum monthly air temperature record for the period 1967-1974.



**Figure 6.** Mean minimum monthly air temperatures recorded at Aldabra Station in 2000-2001 in comparison to the mean minimum monthly air temperature record for the period 1967-1974.

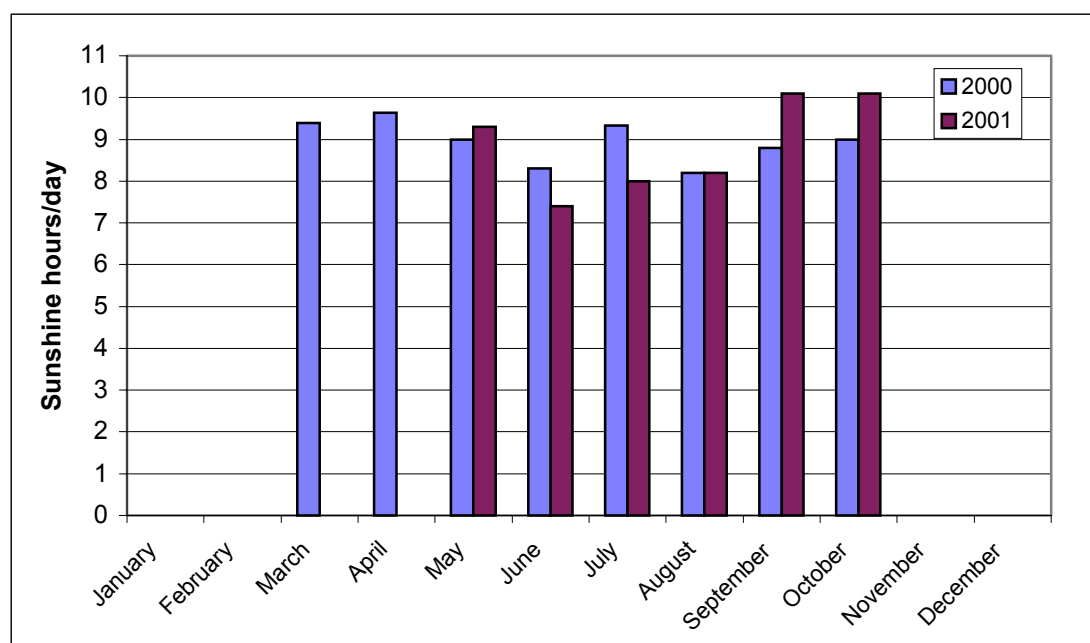
The mean annual maximum temperatures 29.6 °C in 2000 and 30.1 °C in 2001 did not differ greatly from the mean 29.8 °C annual maximum temperature for the period 1967-1974. Nor did the 2000 mean annual minimum temperature of 24.2 °C differ much from the 24.1 °C for the period 1967-1974. The 2001 mean annual minimum temperature of 25.8 °C, however, was a whole 1.7 °C above the corresponding mean for the period 1967-1974. This value appears somewhat extreme and the accuracy of the minimum temperature thermometer may be questionable, as the anomalies appear to have started after October 2000 when a new minimum temperature thermometer replaced an existing thermometer that had become faulty. There is some evidence to suggest that this may be the case as there are a few occasions when the recorded minimum temperature was actually higher than the maximum temperature for the same 24-hour period (Appendix II). In order to ensure that accurate data is collected in the future I would strongly recommend having a meteorological technician inspect the minimum temperature thermometer during his or her next visit to the atoll.

### 1.1.3 Sunshine

In March 2000 the sunshine recorder located at the Station was put back into use. Specially designed recording cards (obtained from meteorological offices) are however necessary in order to obtain any data from this card, as a trace is burnt along the card, which is inserted into the sunshine recorder. The

total length of this trace shows the duration of bright sunshine throughout the day.

Unfortunately, we have not always had an adequate supply of the recording cards. The National Meteorological Services on Mahé have kindly supplied us twice with a collection of sunshine recording cards and, whenever available, these cards were changed daily and the traces with total duration of sunshine were read and computerized. Average daily duration of sunshine is shown in Figure 7 for those months when we had a supply of recording cards at the Station and with evident gaps of data for the periods we were out of cards.



**Figure 7.** Average sunshine hours per day for various months in 2000 and 2001.

*Note that sunshine recording cards were unavailable November 2000 – April 2001 and after October 2001.*

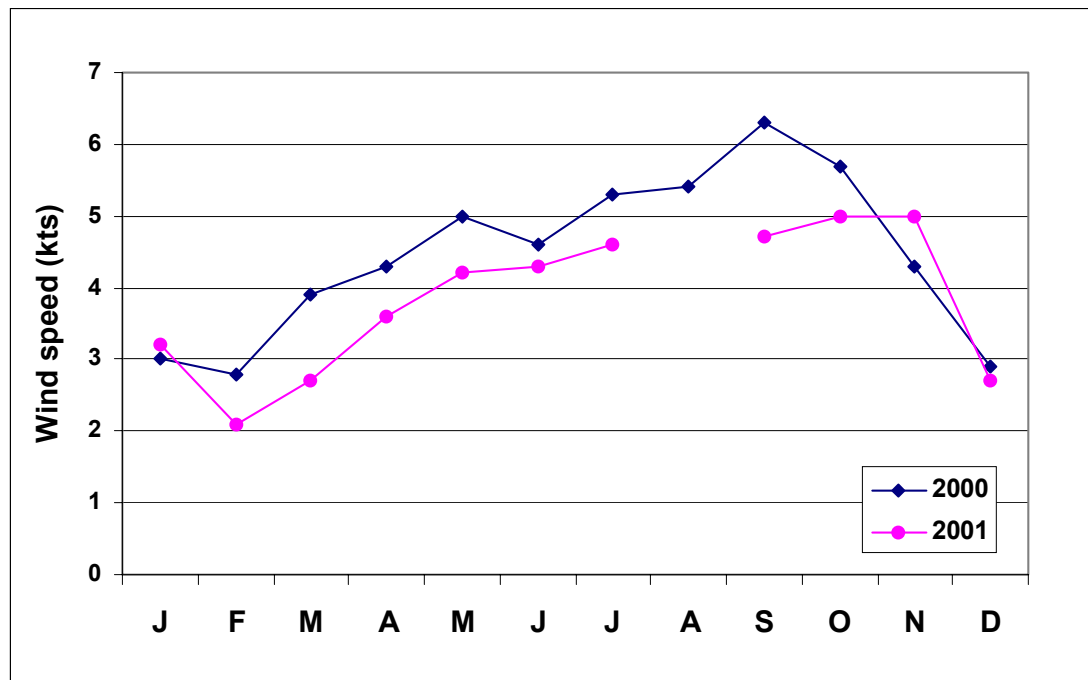
#### 1.1.4 Wind Speed and Direction

An anemometer is connected to the automatic weather station, from which wind speed and direction readings are transferred automatically to the Meteorological Office on Mahé. A manual reading of wind speed and direction is however also carried out during the daily 0400hrs GMT weather reading (Appendix II). Wind speed is recorded as mean and max velocities during a 10-minute period. Mean wind speed at 0400hrs GMT is illustrated in Figure 8, while maximum velocities have been presented in Table 2.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>2000</b>	12	12	11	12	12	13	13	14	19	13	11	9
<i>n</i>	1	1	1	1	2	2	6	1	1	7	1	1
<b>2001</b>	10	11	9	11	12	13	13	-	11	14	9	10
<i>n</i>	3	1	3	2	3	1	1	-	4	2	1	1

**Table 2.** Maximum wind speed recorded at 0400hrs GMT with *n* being the frequency at which that particular wind speed was recorded during each given month.

The weather station was down for the entire month of August 2001, thus the missing data points in Table 2, Figure 8 and Appendix II.



**Figure 8.** Mean wind speed over a 10-min period at 0400hrs GMT.

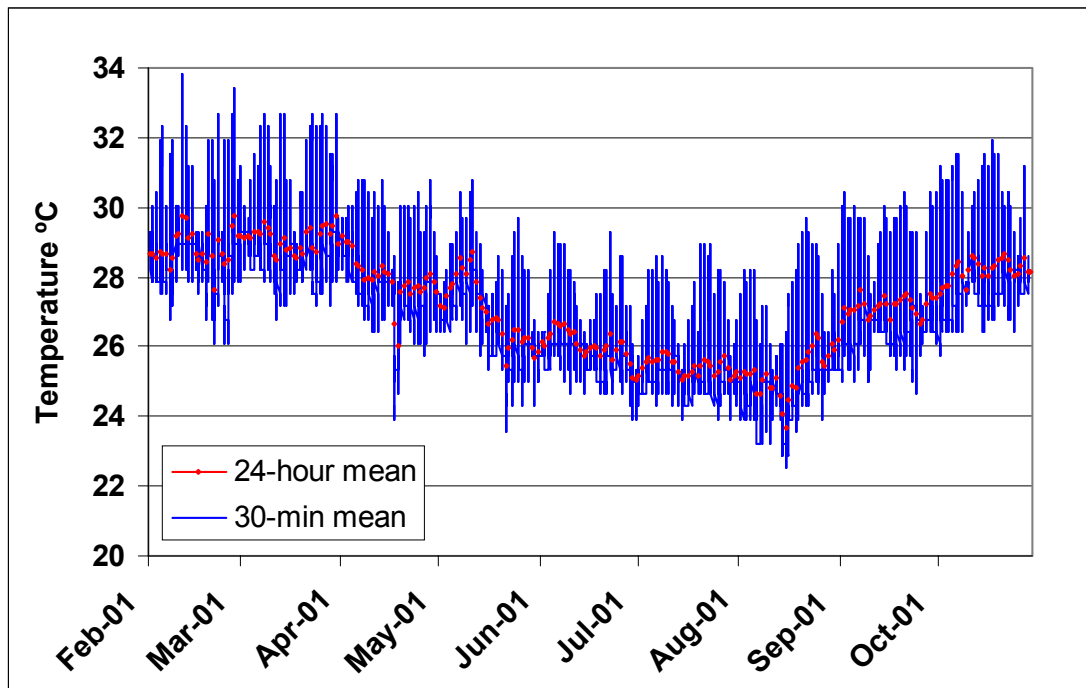
As expected, a rise in wind speed was indeed observed in 2000 and 2001 during the southern hemisphere winter months when the Trade Winds blow southeasterly. This trend has previously been documented for Aldabra (Stoddart and Mole, 1977).

### 1.1.5 Sea Temperature

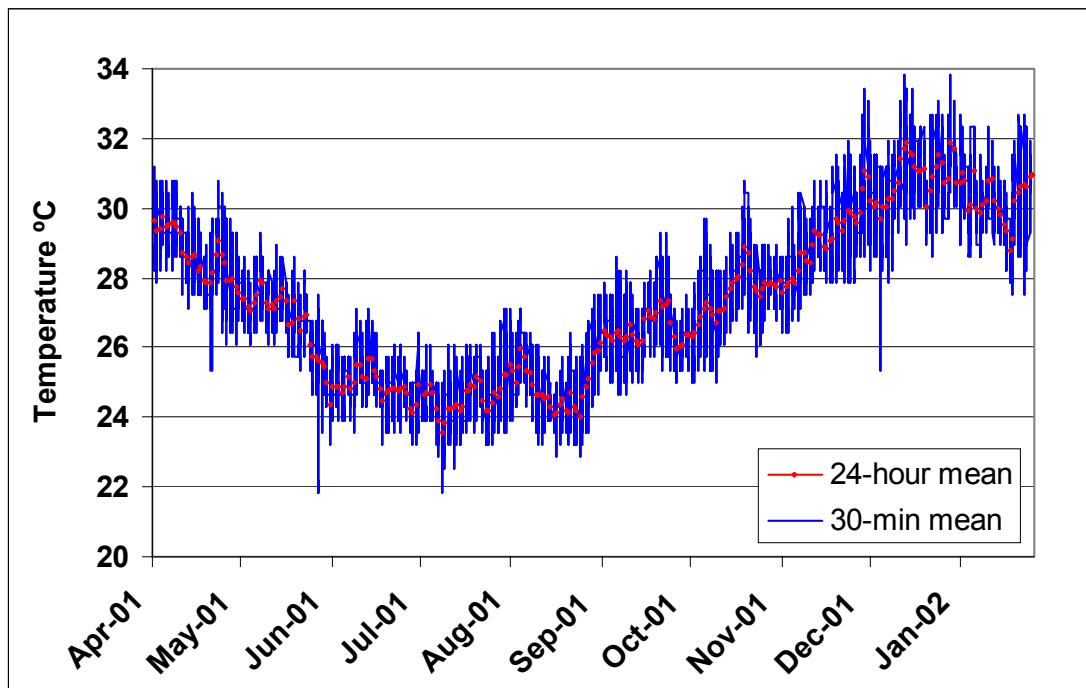
The Aldabra Marine Programme (AMP) group of marine scientists (Cambridge Coastal Research Unit and University of Washington) visited Aldabra during the marine expeditions in February 2001 and 2002. Coral, echinoderm and reef fish communities were resurveyed along previously established permanent transects and some additional sites were set up inside the lagoon, channels and along the south exterior of the atoll. I was fortunate enough to participate in the expeditions, assisting with echinoderm surveys in 2001, as well as coral recruitment surveys in both 2001 and 2002. SIF ranger Tina Dubel also had the opportunity of joining the expedition in 2001.

During the February 2001 expedition a number of automatic temperature loggers were installed along the reef sites by the AMP group of marine scientists and downloaded again during the February 2002 expedition. Additionally, AMP provided two loggers for Aldabra staff to place inside one of the channels and inside the lagoon. Passe Dubois was chosen as the channel site (S 9° 23.752'; E 46° 12.269'), while an area just north of Ile Esprit (S 9° 25.024'; E 46° 15.159') was selected as the location of the lagoon site. Both loggers were deployed at a depth of 3 meters and set to record temperatures at 30-minute intervals. A metal stake was attached to the substrate at each location with a plastic mesh cage attached to it, holding the temperature loggers in place. David Rowat assisted Aldabra staff with the installation of the Passe Dubois logger in February 2001, while Aldabra research officer and rangers deployed the lagoon logger in April 2001. The software *Boxcar Pro 4.0*, necessary for downloading and viewing the temperature data, was installed by AMP on the Station computer and Aldabra research officer and rangers have been downloading data from the Ile Esprit and Passe Dubois temperature loggers every 2-3 months over the past year. Upon the request of AMP we also downloaded data from one of the AMP site loggers located at 10m depth along the Settlement Reef transect (S 9° 24.1005'; E 46° 12.0425') and forwarded data electronically on a regular basis to the AMP group. The approximate location of the loggers downloaded by Aldabra monitoring staff is shown in Figure 1.

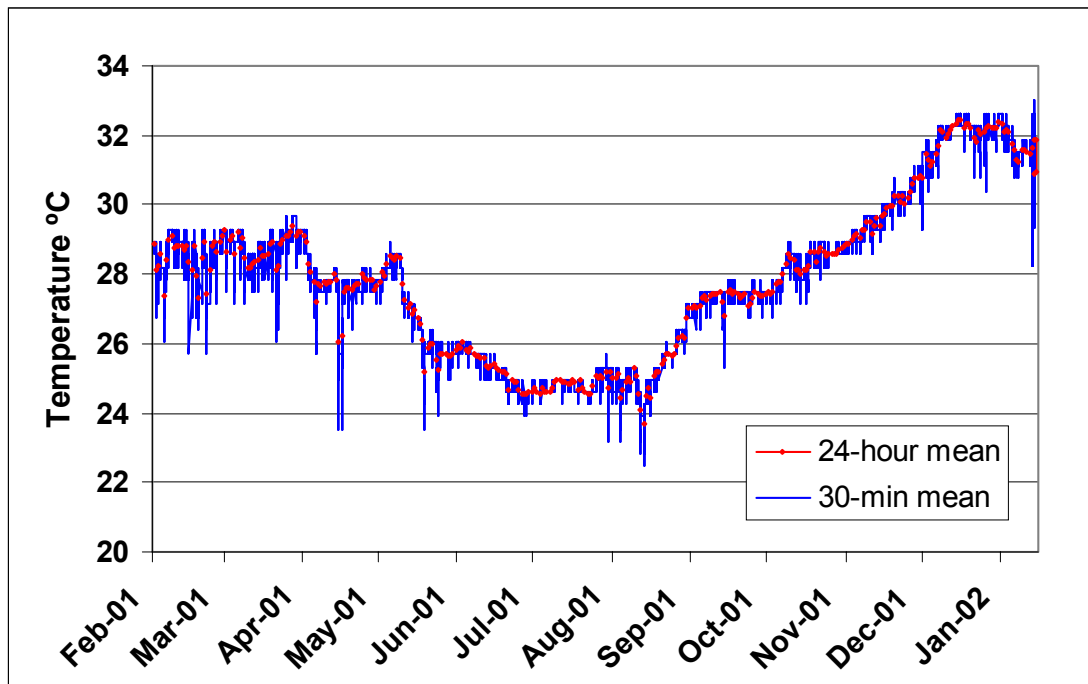
Temperature data recorded by the individual loggers located at Passe Dubois, Ile Esprit and Settlement reef can be viewed in figures 9-11. The 30-minute interval temperature data set is shown in blue, while a 24-hour mean is illustrated in red. Monthly averages were calculated for the data sets at all three locations and are shown in figure 12. The raw data has been stored on the Station computers with back-up floppies of data forwarded to SIF and AMP and also held at Aldabra station. The data points are too numerous to attach as an appendix to this report.



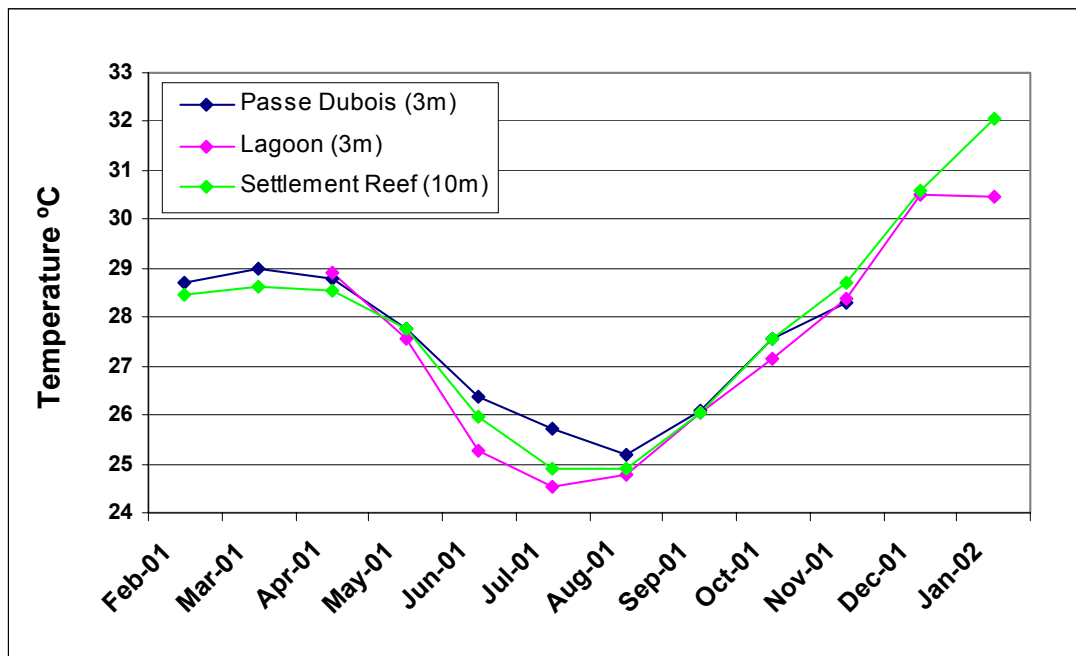
**Figure 9.** Sea temperature data logger at 3m depth at Passe Dubois, Aldabra atoll.



**Figure 10.** Sea temperature data logger at 3m depth inside lagoon near Ile Esprit, Aldabra atoll.



**Figure 11.** Sea temperature data logger at 10m depth on Settlement Reef (AMP Site 1), Aldabra atoll.



**Figure 12.** Average monthly sea temperatures recorded at Passe Dubois, Ile Esprit and Settlement Reef.



## 1.2 Aldabran Giant Tortoise *Dipsochelys elephantina*

The frequency of tortoise monitoring, or transect counts, has been once per month since 1997. During the period covered by this report, every effort was made to carry out the transect counts on a monthly basis, as recommended in the Aldabra Management Plan (Operations Manual section 6.3.3.). For the most part this could be achieved without major problems, although on a few occasions we were unable to reach transect locations due to a lack of monitoring staff, failure of outboards, cases of illness, or staff being unavailable for monitoring work during times of increased visitor activity.

Carrying out the counts on a monthly basis is not overly time-consuming in itself, but increases the need for a sufficient number of rangers on Aldabra at all times if other aspects of the monitoring programme are not to suffer. This is due to the fact that each transect must be carried out between 07:00 and 09:00 in the morning, which coincides with the timing of most other monitoring activities on Aldabra, and also due to the requirement of a **minimum** of 2 recorders per transect (Operations Manual 6.3.4.). Over the years, the methodology has been compromised (in terms of the number of recorders per transect) at times in order to complete the transect counts each month with the numbers of staff available. The problem was brought to the attention of the SIF scientific sub-committee in the RO November 2000 report and was also the focus of discussions between Dr. Bourn and the research officer. It was confirmed that there must *at all times* be at least two observers per transect, and if this could not be achieved on a monthly basis it would be better to carry out the transect count less frequently (bi-monthly or quarterly) without compromising the number of recorders per transect. As pointed out by Dr. Bourn and also as evident from Figures 13-24, there is a considerable degree of “noise” in the data collected. For this reason it is recommended that every effort should be made to conduct the transect counts every month if possible with the number of rangers available. Since these discussions and up to the end of my contract in February 2002, there have been at least two observers per transect, or the transect count has not been carried out at all that month.

Other data recorded along the transects, in addition to numbers of tortoises, include details on measurements of third dorsal scute, male/female characteristics, and any encounters with dead or tagged tortoises. All data collected were computerised with copies forwarded to SIF and original data recording sheets filed in the Station library. Prior to 2001, all tortoise data were computerised in MS Works. In January 2001, however, the software used for data entry was replaced by MS Excel.

In order to facilitate regular analysis and reporting of tortoise data collected by rangers on Aldabra atoll, a menu-driven database management system has also been proposed by ERGO. If eventually acquired by SIF and truly user-friendly, this automated system could prove to be helpful in promoting regular reporting on the results from transect-counts by SIF rangers.

The tortoise transect counts conducted during the period of this report have been summarised in Table 2., while tortoise densities (i.e. number of tortoises per hectare) based on the transect count data since 1996/1997 and up to December 2001 are presented in Figures 13-24. A trend line has been superimposed over the data points and the statistical significance of any changes summarised in Table 3.

All Cinq Cases transects continue to show a highly statistically significant decline in tortoise numbers, as previously indicated by Bourn (2001) and also found during the last tortoise census by ERGO (1997). Other statistically significant changes include a decrease in tortoise abundance along the Anse Var and Dune d'Messe Inland transects, while the coastal transect on Picard indicates an increase in tortoise numbers.

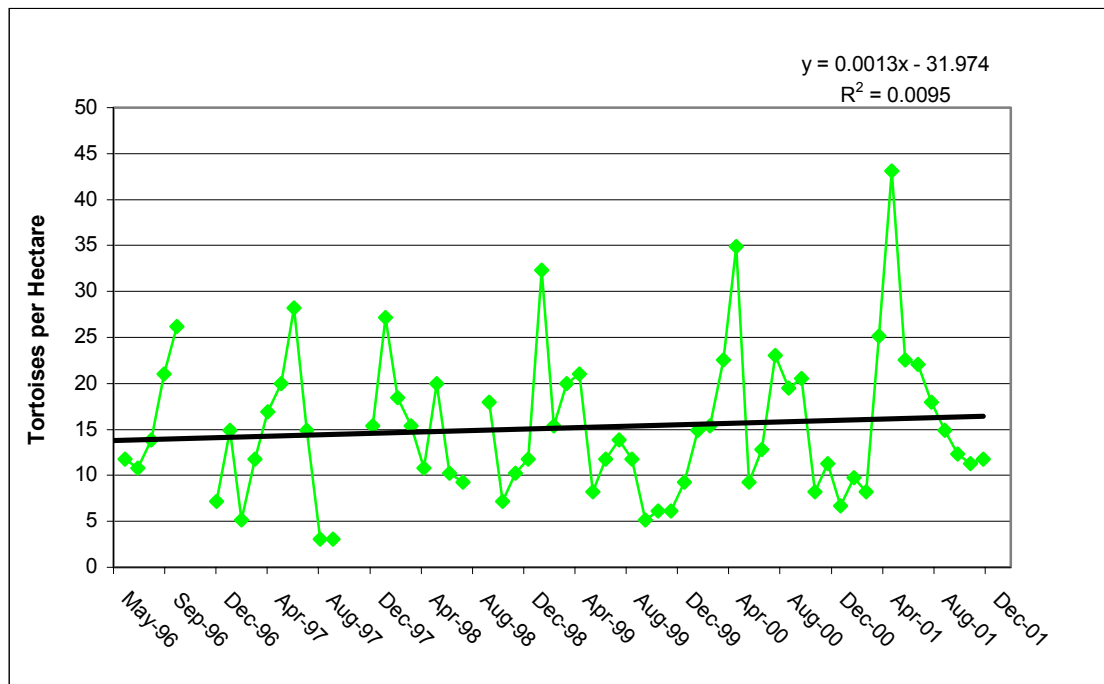
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	<i>XII</i>
<b>Aug-00</b>	45	19	2	36	21	6	31	41	28	16*	14*	36*
<b>Sep-00</b>	38	73	12	41	28	1	18	34	21	8	23	22
<b>Oct-00</b>	40	55	3	55	48	1	9	41	21	8	16	18
<b>Nov-00</b>	16	114	19	24	41	0	22	27	20	23	31	25
<b>Dec-00</b>	22	73	x	x	x	X	x	x	33	15	13	42
<b>Jan-01</b>	13	25	12	40	11	16	17	41	53	11	13	127
<b>Feb-01</b>	19	55	15	x	x	X	20	85	55	27	14	123
<b>Mar-01</b>	16	31	12	34	21	14	33	83	54	22	10	166
<b>Apr-01</b>	49	47	12	33	37	20	24	94	53	x	x	x
<b>May-01</b>	84	12	12	21	20	10	12	92	37	29	15	45
<b>Jun-01</b>	44	6	14	9	21	16	x	x	x	30	9	48
<b>Jul-01</b>	43	x	6	x	20	11	14	27	33	17	11	21
<b>Aug-01</b>	35	35	9	27	21	3	31	27	20	16	15	18
<b>Sep-01</b>	29	59	7	45	29	7	30	54	x	x	x	x
<b>Oct-01</b>	24	106	17	67	25	6	20	35	36	28	20	25
<b>Nov-01</b>	22	89	6	31	21	5	26	27	19	22	8	58
<b>Dec-01</b>	23	97	11	x	x	X	22	27	57	12	21	80
<b>Jan-02</b>	18	70		28	35		25	91	43	23	16	114

**Location of transects I-XII:** I, Station Backpath; II, Station Coastal; III, Anse Var; IV, Anse Malabar; V, Middle Camp Inland Traverse; VI, Middle Camp Coastal; VII, Cinq Cases Groves; VIII, Cinq Cases Coco; IX, Cinq Cases Coastal; X, Dune Jean Louis; XI, Dune d'Messe Inland; XII, Dune d'Messe Coastal.

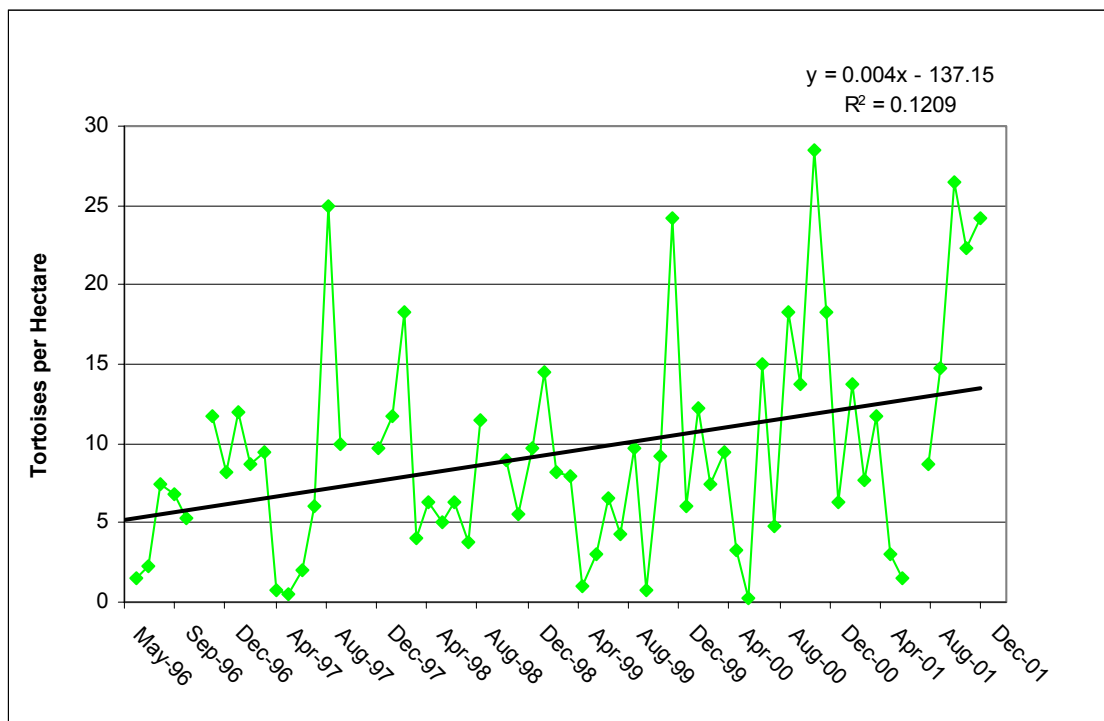
\* *Mean of two monthly counts*

x *No count carried out*

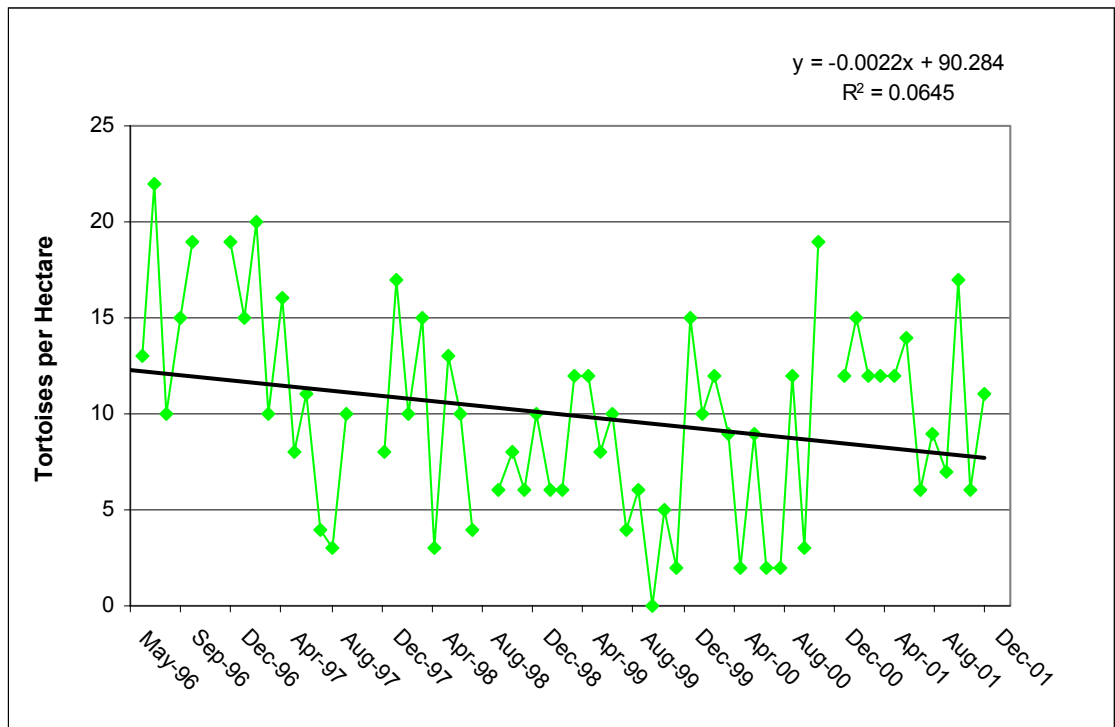
**Table 2.** Numbers of tortoises counted within each transect August 2000-January 2002.



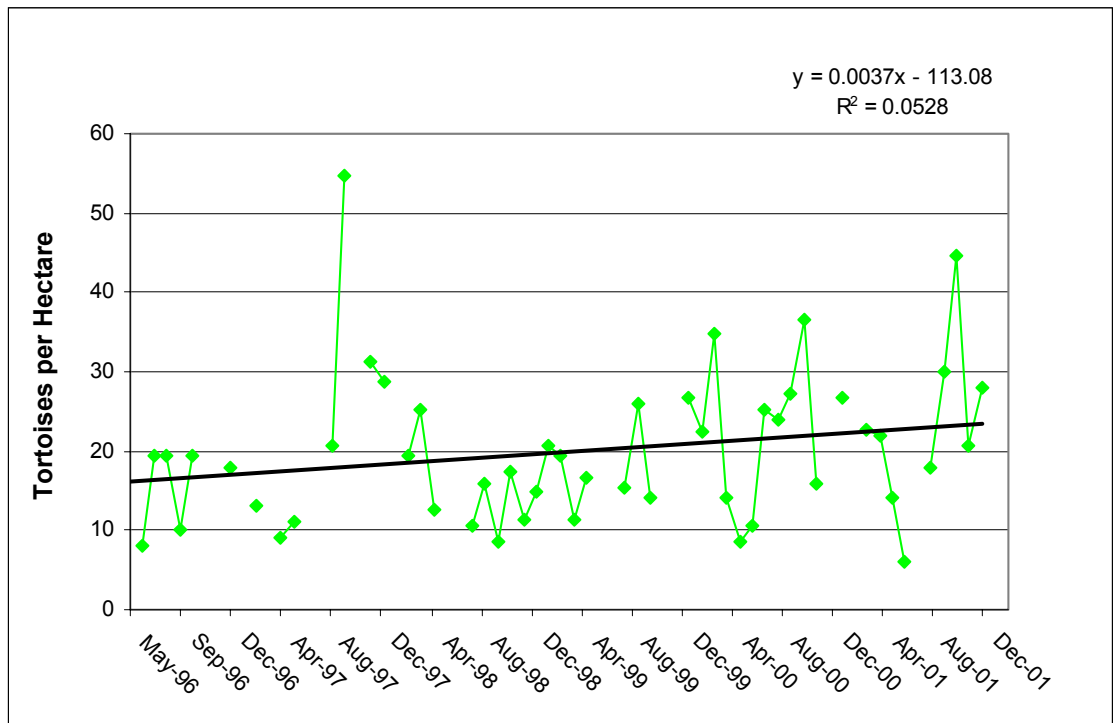
**Figure 13.** Tortoise density along Station backpath transect, Picard Island, June 1996-December 2001.



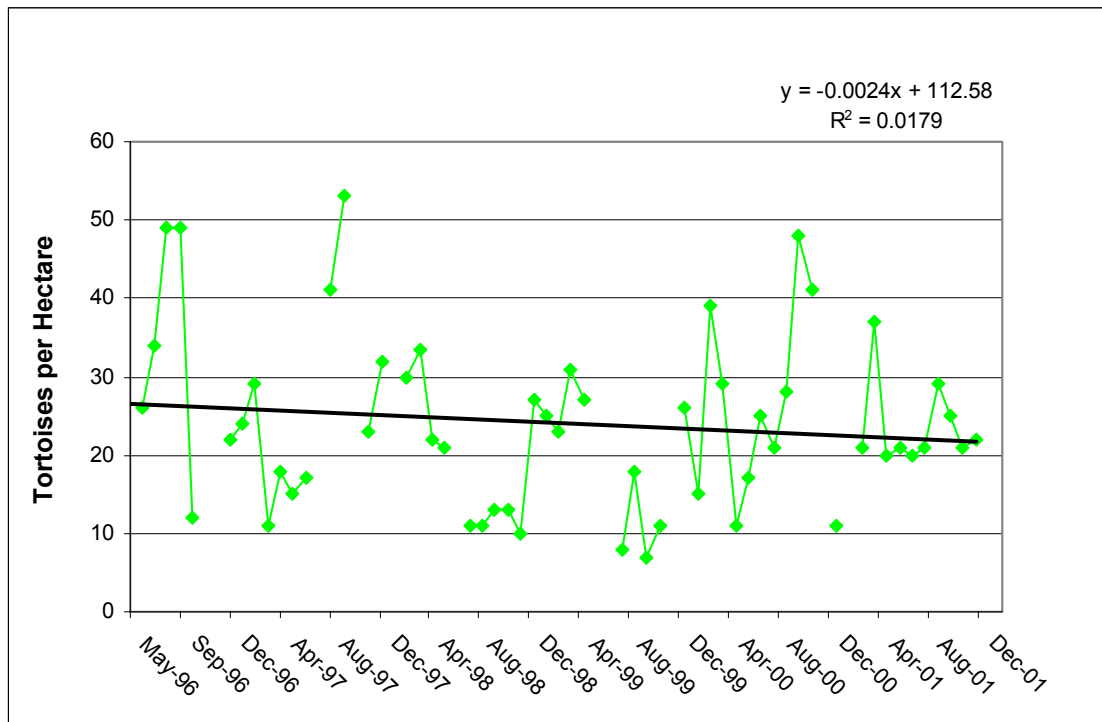
**Figure 14.** Tortoise density along Station coastal transect, Picard Island, June 1996-December 2001.



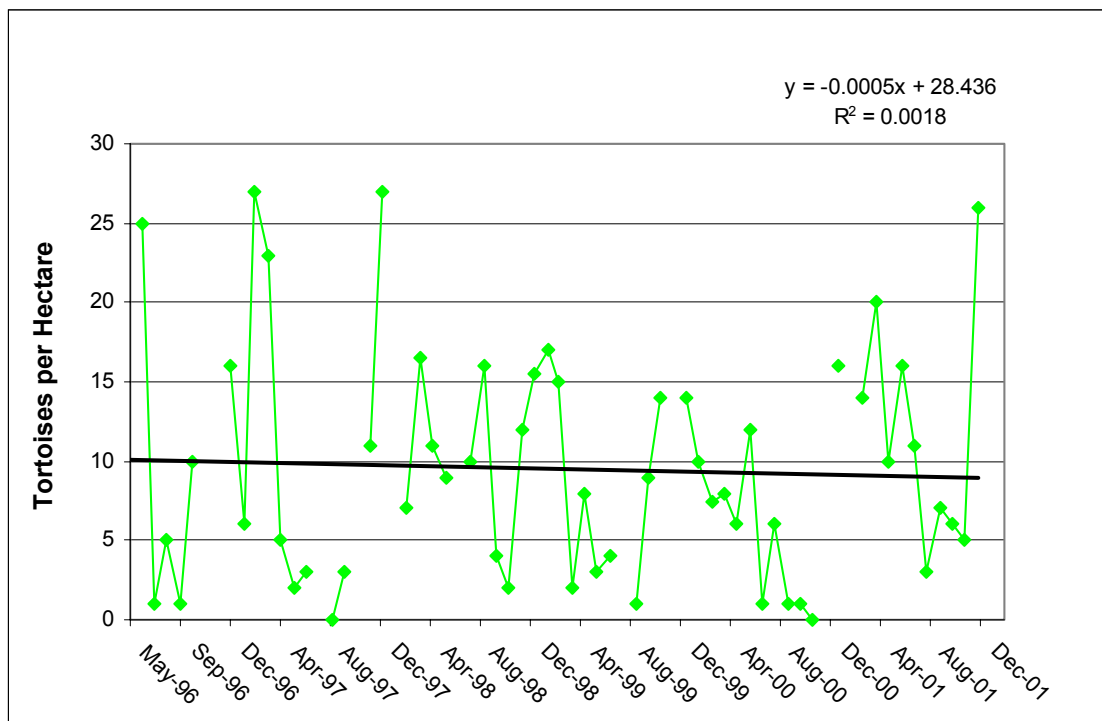
**Figure 15.** Tortoise density along Anse Var transect, Picard Island, June 1996-December 2001.



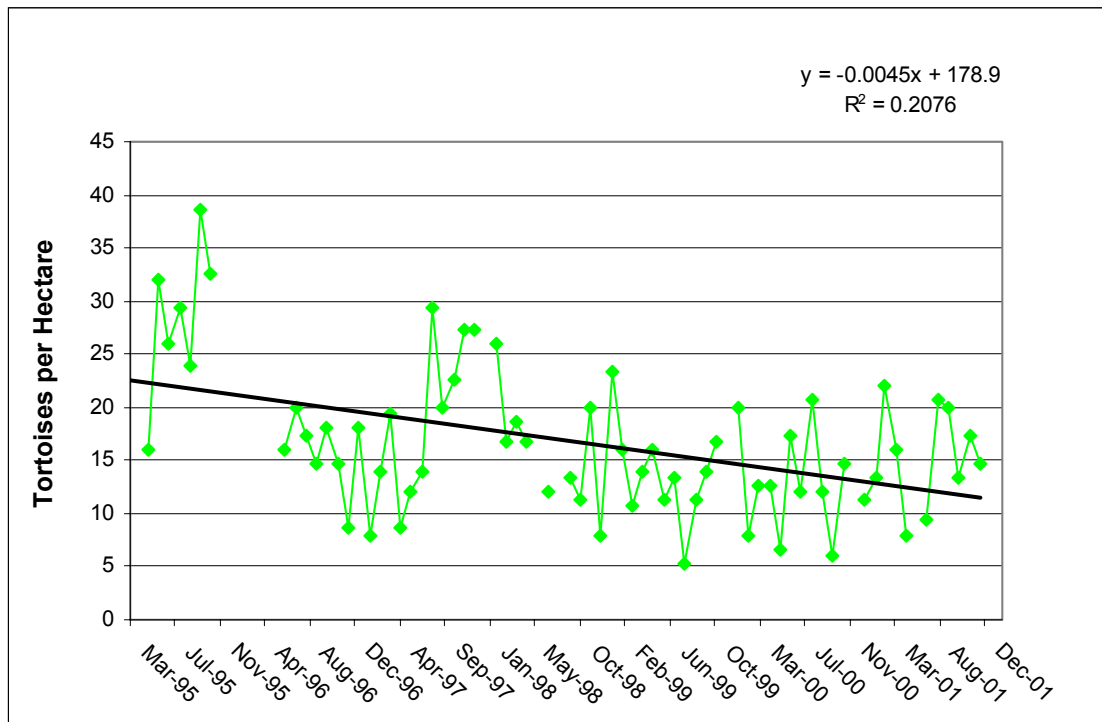
**Figure 16.** Tortoise density along Anse Malabar transect, Malabar Island, June 1996-December 2001.



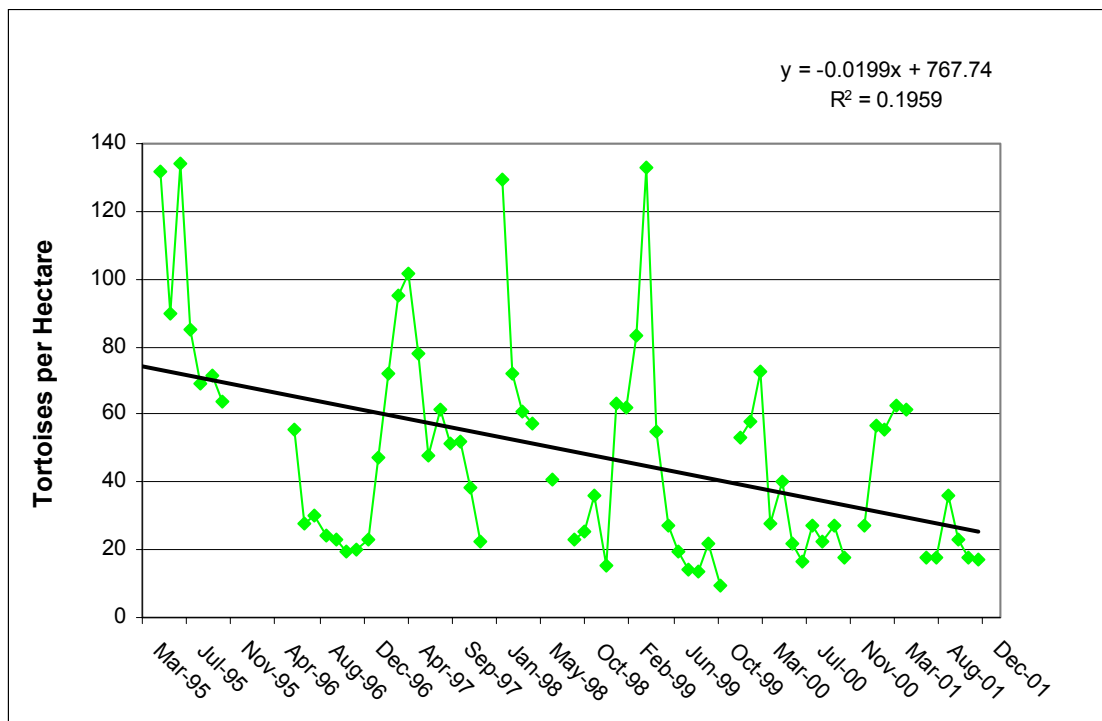
**Figure 17.** Tortoise density along Middle Camp Inland Traverse transect, Malabar Island, June 1996-December 2001.



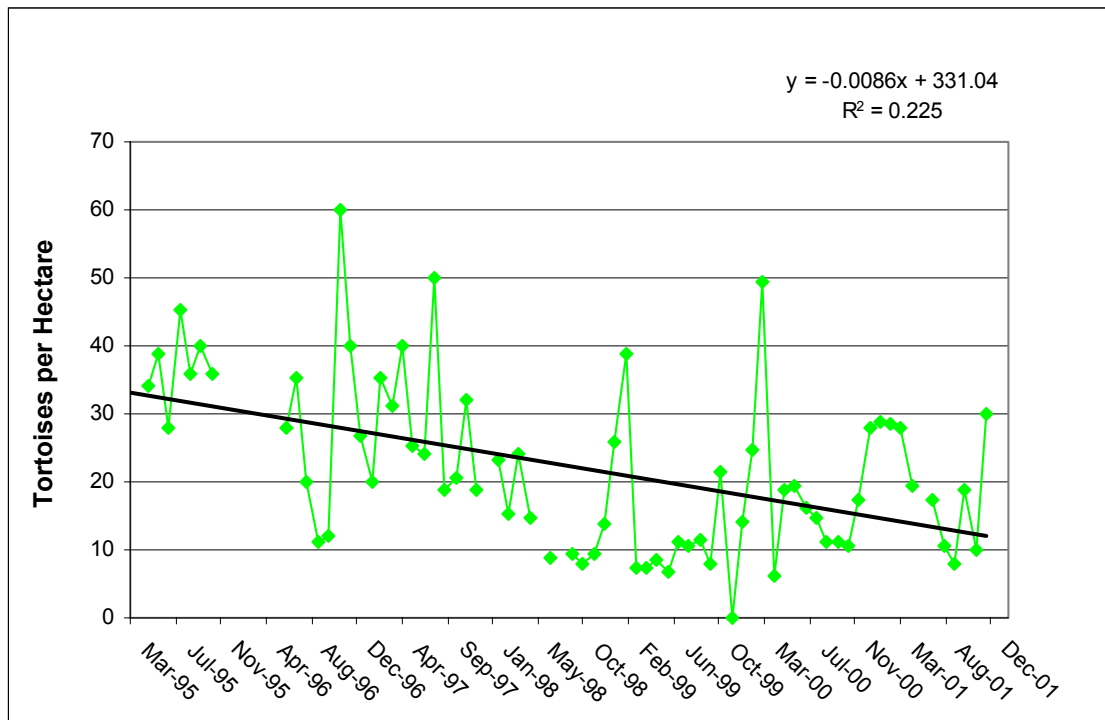
**Figure 18.** Tortoise density along Middle Camp Coastal transect, Malabar Island, June 1996-December 2001.



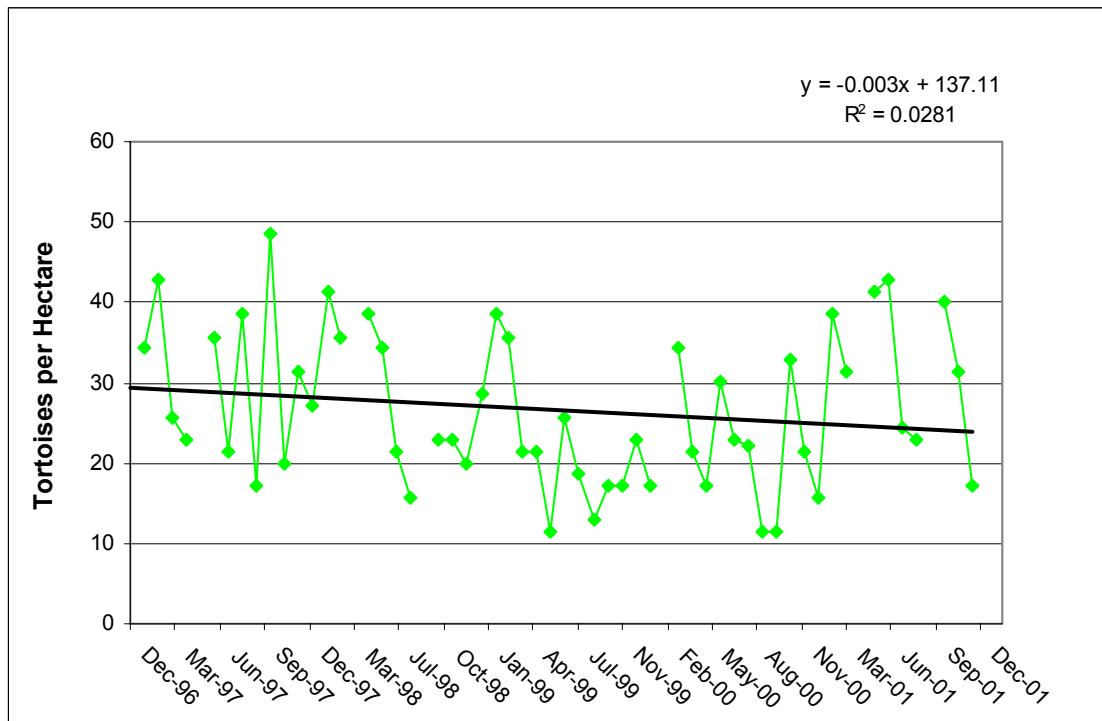
**Figure 19.** Tortoise density along Cinq Cases Groves transect, Grand Terre, May 1995-December 2001.



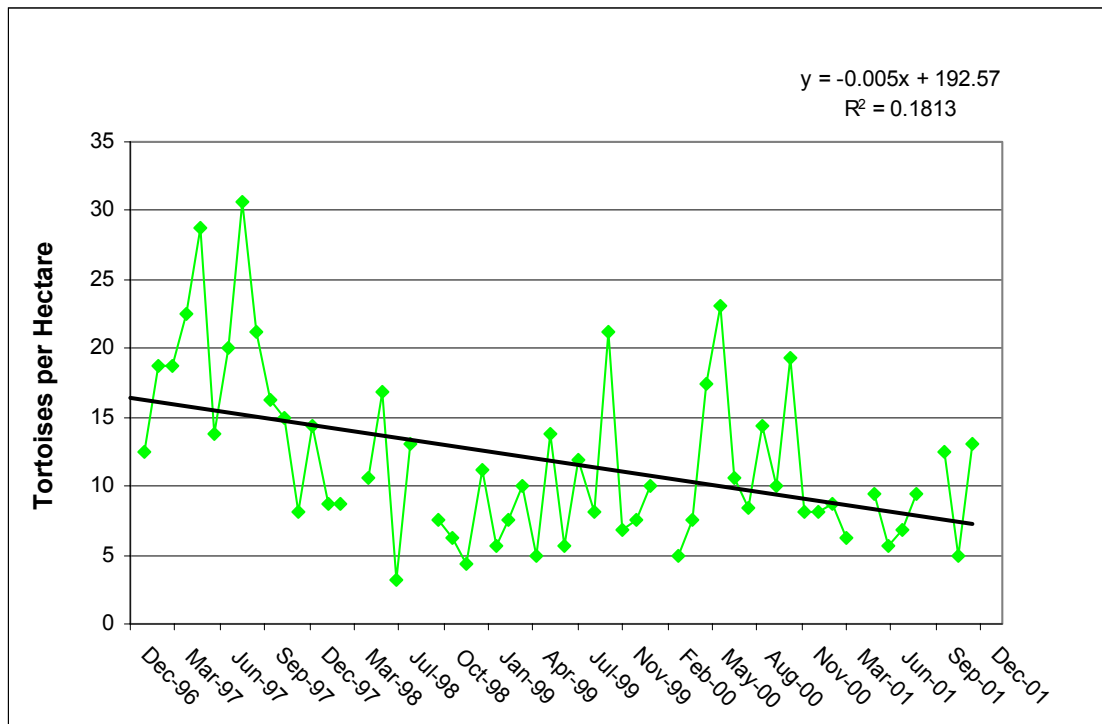
**Figure 20.** Tortoise density along Cinq Cases Coco transect, Grand Terre, May 1995-December 2001.



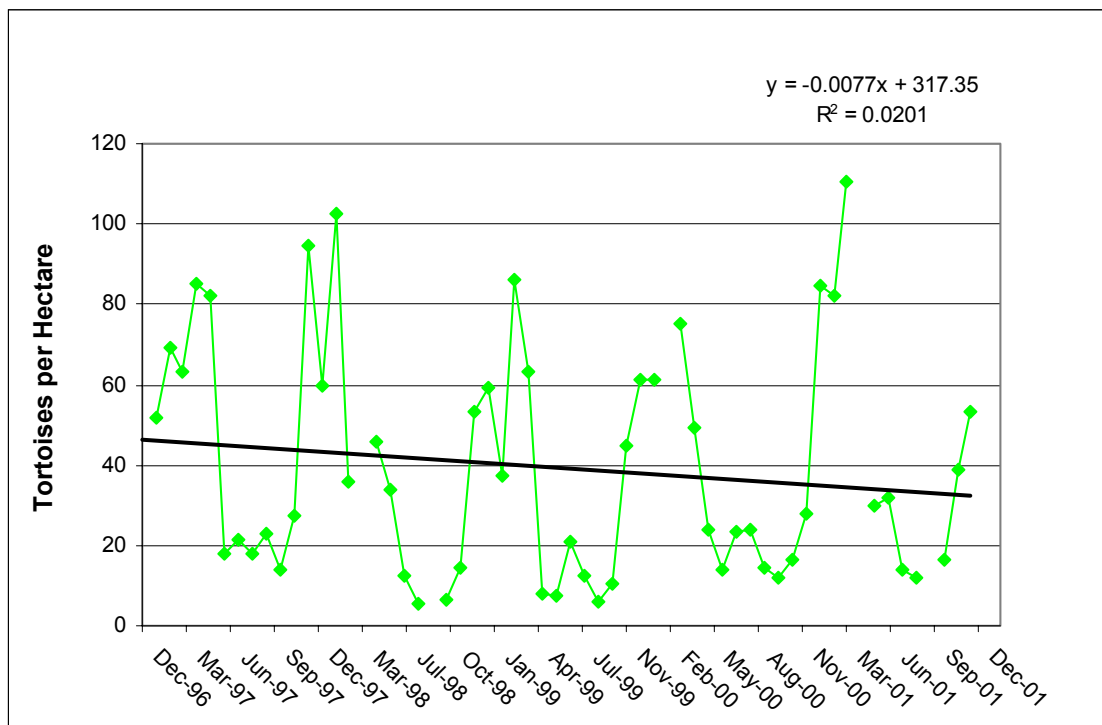
**Figure 21.** Tortoise density along Cinq Cases Coastal transect, Grand Terre, May 1995-December 2001.



**Figure 22.** Tortoise density along Dune Jean-Louis Inland transect, Grand Terre, January 1997-December 2001.



**Figure 23.** Tortoise density along Dune d'Messe Inland transect, Grand Terre, January 1997-December 2001.



**Figure 24.** Tortoise density along Dune d'Messe Coastal transect, Grand Terre, January 1997-December 2001.



	$r^2$	$df_1$	$df_2$	F	Probability	Significance
<b>Station Backpath</b>	0.0095	1	60	0.58	0.45106	no
<b>Station Coastal</b>	0.1209	1	60	8.25	0.00562	yes
<b>Anse Var</b>	0.0645	1	59	4.07	0.04826	yes
<b>Anse Malabar</b>	0.0528	1	48	2.68	0.10843	no
<b>Middle Camp Inland</b>	0.0179	1	54	0.98	0.32558	no
<b>Middle Camp Coastal</b>	0.0018	1	55	0.10	0.75401	no
<b>Cinq Cases Groves</b>	0.2076	1	66	17.29	0.00009	yes
<b>Cinq Cases Coco</b>	0.1959	1	66	16.08	0.00016	yes
<b>Cinq Cases Coastal</b>	0.2250	1	67	19.45	0.00004	yes
<b>Dune Jean-Louis</b>	0.0281	1	52	1.50	0.22567	no
<b>Dune d'Messe Inland</b>	0.1813	1	53	11.74	0.00119	yes
<b>Dune d'Messe Coastal</b>	0.0201	1	53	1.09	0.30184	no

**Table 3.** Results from F test statistic and summary of linear regression coefficient of determination ( $r^2$ ) for the various transect counts.

While analysing these data, a discrepancy was discovered between the Station Coastal transect length stated in the Aldabra Management Plan (Operations Manual, section 6.3.6.) and the actual transect length. There are 40 markers (spaced 50-m apart) along the Station coastal transect and not 30 markers as stated in the Operations Manual, making the total length of the transect 2000m rather than 1500m. This inconsistency needs to be corrected since the difference in transect length changes the total area surveyed and consequently also the results for anyone attempting to look at the density of tortoises within a given transect. Also, it needs to be established whether the transect length was ever increased since the printing of the Management Plan or if this is simply a typing error in the document itself.

### 1.3 Sea Turtles *Chelonia mydas* and *Eretmochelys imbricata*

The current long-term turtle monitoring programme around Aldabra, which has been set up by Dr. Jeanne Mortimer, involves (1.) regular beach surveys upon which the number of tracks made by nesting turtles are counted, (2.) night-time tagging of nesting turtles, and (3.) studies of immature turtles inside the lagoon.

Some 49 external beaches were surveyed (Figure 25), with *Chelonia mydas* being the main nesting turtle along the exterior of the atoll. Though considerably less frequent, there is *some* nesting activity by *Eretmochelys imbricata* on beaches inside the lagoon, and beach surveys have therefore included areas within the lagoon (Figure 27) whenever possible.

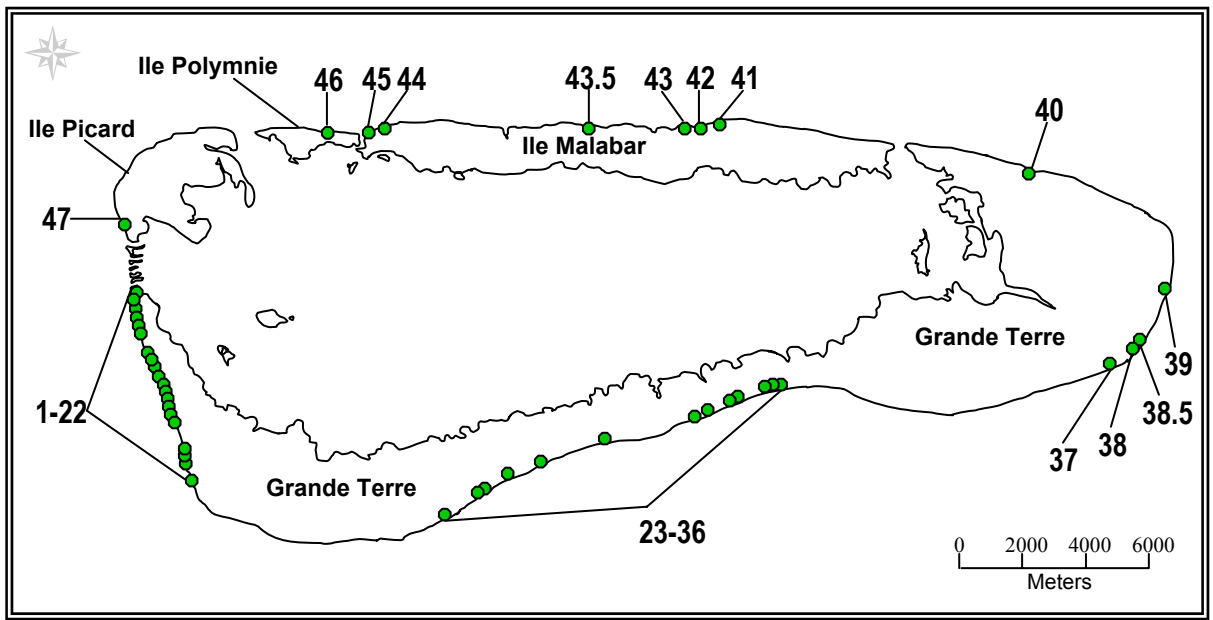
Night-time tagging of nesting *C. mydas* was carried out in conjunction with scheduled monthly monitoring visits to the various field camps around the atoll and also opportunistically along Settlement beach (#47) in front of the Station.

Immature turtles, captured mainly around Ile Esprit and Ile Moustique, as well as Passe Hoareau area, were tagged, measured, weighed and sampled for DNA before their release back to their foraging grounds.

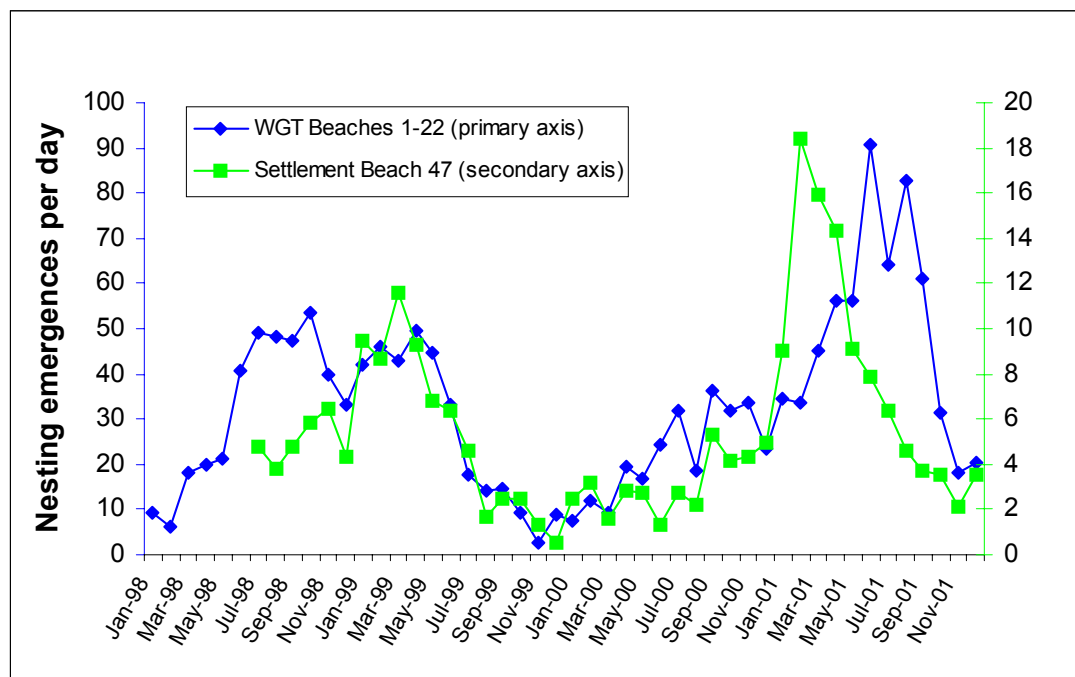
#### 1.3.1 Track Counts along External Beaches

Settlement Beach #47 and the 'index beaches' #1-22 (Figure 25), by far the most active turtle nesting beaches around Aldabra, were surveyed more frequently than the remaining beaches. We aimed to visit beaches 1-22 at least 4 times per month, and more often if possible. The most regular and frequent beach surveys were carried out along Settlement Beach (47) due to its easy access from the Station. Most other beaches were surveyed approximately once per month, usually in conjunction with field camp visits, depending on numbers of staff available and if we were able to reach the area in question. Beach 40 was usually difficult to reach due to rough seas, as was beach 23 due to time constraints and conflicts with other monitoring activities during field camp visits.

Average numbers of emergences per day for a given month were calculated for the beaches surveyed. This was done by adding up the number of 'very fresh' tracks (i.e. tracks less than 24 hours old) recorded during a month and dividing this figure by the number of observations or surveys carried out that same month. The resulting number of emergences per day along beaches 1-22 and 47 are illustrated in Figure 26. Please note the secondary axis and difference in scale for the two data sets.



**Figure 25.** Locations of beaches along the exterior of Aldabra atoll.



**Figure 26.** Average number of nesting emergences per day along Settlement Beach (47) and West Grand Terre 'index beaches' (1-22), 1998-2001. Note secondary axis and difference in scale for the two data sets.

The average monthly track counts along the remaining beaches are summarised in Tables 4 and 5.

	South Beaches													
	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Aug-00	0	0	0	0.5	0	0	0	2	0	3	2.3	2	0.3	0.7
Sep-00	x	0	0	0	0	0	0	1	0	1.5	0	1	0	1
Oct-00	X	0	0	0	0	0	0	1	0	2	1	0	1	0
Nov-00	x	0	0	0	0	0	0	0	0	1	0	0	0	0
Dec-00	x	x	x	2	0	0	2	0	0	1	x	x	x	x
Jan-01	x	x	0	0.5	1	0	1	9	1	1	1	4	2.5	x
Feb-01	x	0	0	0	x	x	1	1	0	2.5	2	5	0	3
Mar-01	0	0	0	1	x	x	x	x	x	8	3	2	2	0
Apr-01	x	x	x	x	x	x	x	x	x	x	x	x	x	x
May-01	0	0	0	0	0	0	4	4	1	11	0	6	0	0
Jun-01	0	0	0	0	0	0	5	4	1	13	0	2	0	0
Jul-01	0	0	0	0	0	0	3	0	3	6	0	0	0	0
Aug-01	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sep-01	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Oct-01	4	0	0	0	0	1	0	2	1	1	0	2	0	0
Nov-01	x	0	0	0	x	x	x	x	2	2.5	2	0.5	0	0
Dec-01	0	0	0	1	x	x	1	2	0	3	1	1	0	1

**Table 4.** Average number of tracks observed each month along beaches 23-36.

South-East Beaches					North Beaches							
	37	38	38.5	39	40	41	42	43	43.5	44	45	46
Aug-00	0	0	0	0	x	0	4	3	0	x	x	x
Sep-00	0	0	0	0	x	1	4.5	4.5	1	1	0	0
Oct-00	0	0	0	0	x	3	5	2.5	x	x	x	x
Nov-00	x	x	x	x	x	1	2	1	x	x	x	x
Dec-00	x	x	x	x	3	x	x	x	x	x	x	x
Jan-01	0	2	0	0	x	2	1	1	x	x	2	x
Feb-01	0	0	7.5	0	1	x	5	x	x	x	1	x
Mar-01	0	0	0	0	4	4	2	1	x	x	1	x
Apr-01	0	0	0	0	x	4	8	3	x	x	x	x
May-01	0	0	0	0	x	4	3	1	x	x	0	x
Jun-01	x	x	x	x	x	3	8	1	x	x	0	x
Jul-01	x	x	x	x	x	x	x	x	x	x	x	x
Aug-01	x	x	x	x	x	4	1	2	x	x	x	x
Sep-01	x	0	0	0	x	1	0	2	x	x	0	x
Oct-01	0	0	0	0	x	0.3	2.5	2	0	1	0.5	5
Nov-01	0	0	0	0	x	2	2.5	0.5	x	1.5	0	3
Dec-01	0	0	0	0	x	0	2	1	0	1.7	0	1.3

**Table 5.** Average number of tracks observed each month along beaches 37-46.

### 1.3.2 Recommendations for survey procedure along the “Index Beaches”

Throughout the course of my appointment as RO on Aldabra, it became increasingly apparent that beach surveys by boat were not suitable along the West Grand Terre ‘Index Beaches’ 1-22. As the sun rises in the East and track counts are carried out between 07:00 and 09:00 in the morning, the sun glare is quite intense in the mornings if facing these beaches (situated along the Western rim of the atoll) from the sea. It was at times extremely frustrating and challenging to distinguish fresh tracks (less than 24 hours old) from ‘old’ tracks.

A few times we compared ‘fresh’ track counts (first made from the boat) with the actual tracks counted after going ashore, and the difference was at times very significant and therefore raised some major concerns in terms of the quality of data collected. The same exercise was also carried out together with Dr. Mortimer, during one of her visits on Aldabra in 2001, and the results confirmed that going ashore for track counts produces far more reliable data.

I recommend that it is essential to go ashore on each and every beach along West Grand Terre to carry out the track count ‘by foot’. Counts made from the boat will not produce reliable data. During rough seas (which is quite frequent around Aldabra) it is not always easy to land on all of the 22 beaches along West Grand Terre.

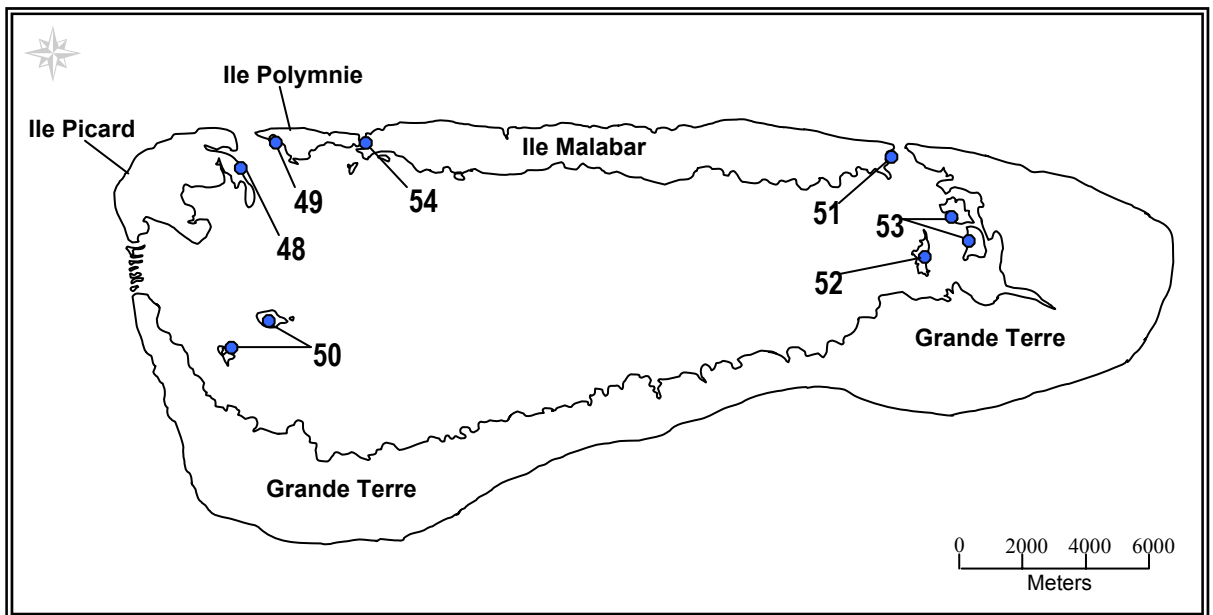
Along the Index Beaches this problem can be solved in either one of the two following ways:

- (1) Scheduling more frequent overnight visits to Anse Mais field hut (beach 15) with turtle tagging in the evenings and morning track counts by foot before returning to the Station the next day. This requires only two landings on one beach during times of rough seas.
- (2) Another successful approach, without involving overnight camping at Anse Mais field hut, is to drop off one monitoring staff on beach 3 (easy access) and another monitoring staff on beach 21 (relatively easy access) at 07:00 in the morning and then to pick up both monitoring staff members on beach 15 (around 09:30) after having surveyed beaches 1-14 and 15-22, respectively, by foot.
  - **Drop off personnel at Beach #3 and #21; pick up staff members at Beach #15.**

### 1.3.3 Track Counts along Lagoon Beaches

Track counts inside the lagoon were scheduled according to conditions of the tide and carried out whenever possible, with greater emphasis from August through March during the Hawksbill nesting season.

The main beaches surveyed within the lagoon, shown in Figure 27, are located around the Main Channel (48-49), Ile Esprit, Ile Sylvestre and Ile Moustiques area (50), Passe Hoareau (51), Ile Michel (52), Ile Aux Cedres (53) and Passe Gionnet (54). Track counts recorded in 2000 and 2001 and number of surveys carried out in each area are summarised in Tables 6-8. In the year 2000 a total of 3 'very fresh' and 14 'fairly fresh' Hawksbill tracks were recorded, while a total of 2 'very fresh' and 43 'fairly fresh' tracks were observed in 2001. The monitoring intensity differed somewhat with a total of 186 surveys in 2001, compared to the 119 surveys made in 2000.



**Figure 27.** Locations of beaches inside the lagoon of Aldabra atoll.

	<b>48a</b>	<b>48b</b>	<b>48c</b>	<b>48d</b>	<b>49a</b>	<b>49b</b>	<b>49c</b>	<b>49d</b>	<b>48-49</b>
<b>VF Tracks 2001</b>	0	0	0	0	1	0	0	0	1
n	16	14	16	16	18	13	13	14	120
<b>FF Tracks 2001</b>	15	0	6	3	9	3	7	0	43
n	15	14	14	15	16	11	12	12	109
<b>VF Tracks 2000</b>	1	0	0	1	1	0	0	0	3
n	11	11	11	11	15	10	6	8	83
<b>FF Tracks 2000</b>	4	0	0	0	7	1	2	0	14
n	11	11	11	11	15	10	6	9	84

n is the number of observations made at each location during the time period 2000 and 2001.

**Table 6.** Numbers of ‘very fresh’ (less than 24 hours old) and ‘fairly fresh’ (greater than 24 hours old) tracks counted on beaches along the Main Channel area (48-49) in 2000 and 2001.

	<b>50a</b>	<b>50b</b>	<b>50c</b>	<b>50d</b>	<b>50e</b>	<b>50a-e</b>
<b>VF Tracks 2001</b>	0	1	0	0	0	1
n	10	9	12	4	4	39
<b>FF Tracks 2001</b>	3	4	5	0	0	12
n	9	9	12	4	2	36
<b>VF Tracks 2000</b>	0	0	0	0	0	0
n	7	7	4	4	2	24
<b>FF Tracks 2000</b>	0	0	0	0	0	0
n	7	7	4	4	2	24

n is the number of observations made at each location during the time period 2000 and 2001.

**Table 7.** Numbers of ‘very fresh’ (less than 24 hours old) and ‘fairly fresh’ (greater than 24 hours old) tracks counted on beaches around the islands located in the Western area of Aldabra lagoon (50) in 2000 and 2001.

	51	52	53	54	51-54
<b>VF Tracks 2001</b>	0	0	0	0	0
n	12	7	4	4	27
<b>FF Tracks 2001</b>	0	0	0	0	0
n	12	7	5	4	28
<b>VF Tracks 2000</b>	0	0	0	0	0
n	2	7	3	0	12
<b>FF Tracks 2000</b>	0	0	0	0	0
n	2	7	3	0	12

n is the number of observations made at each location during the time period 2000 and 2001.

**Table 8.** Numbers of ‘very fresh’ (less than 24 hours old) and ‘fairly fresh’ (greater than 24 hours old) tracks counted on beaches around Passe Hoareau (51), the islands located in the Eastern area of Aldabra lagoon (52-53), and the Eastern side of Passe Gionnet (54) in 2000 and 2001.

Most Hawksbill tracks were observed along beaches in the Main Channel area, although these were also the most intensively monitored beaches due to ease of access from the Station. In the RO report 1999-2000, it was mentioned that Polymnie beaches I – VI (i.e. 49c) had shown no activity. These beaches were not considered suitable for nesting and therefore excluded from the monthly surveys as a ‘time-saving measure’. Even so, during my appointment as RO, I opted to include these beaches during lagoon surveys due to their proximity to other beaches being surveyed in the area and the track counts made in 2000-2001 actually did indicate that nesting had occurred within Polymnie beaches I – VI. I have observed evidence of nesting activity along these ‘pseudo’ beaches myself and results from surveys have in fact revealed that a total of 7 fairly fresh tracks (12% of all tracks recorded during the year) were recorded in this particular area in 2001. The ‘beaches’ do appear very inhospitable with champignon for the turtles to cross before reaching nesting grounds (though less of a problem during spring high tides), but as recent track count data have shown, they I would recommend them worth including in the lagoon beach surveys after all.

#### 1.3.4 Tagging of Nesting *Chelonia mydas*

A total of 371 nesting green turtles, *C. mydas*, were encountered during night-time tagging expeditions and morning track counts in 2001. New tags were applied to 292 of those, while 79 had already been tagged during previous nesting emergences and therefore obviously returning to nest on Aldabra’s beaches. In 2000, a total of 309 encounters were made with nesting green



turtles. Some 219 of those were tagged for the first time, while 88 turtles were recoveries from previous tagging work. No observations of turtles with tags from neighbouring countries in the Indian Ocean region were made during my time on Aldabra.

### **1.3.5 In-Water Work on Immature Turtles**

The 'rodeo-method', which involves standing at the bow of a boat and chasing the turtle before jumping into the water and grabbing it, appeared very popular amongst monitoring staff. The Warden, however, expressed some concern over the safety aspect of this exercise. This method of catching immature turtles for the in-water study was, nonetheless, allowed to continue throughout my time on Aldabra. It should be noted that this is not a 'high speed' chase by any means, but the exercise does require proper communication between rangers and the boatman, as well as a safety conscious boatman (i.e. making sure the outboard is in neutral when people leap overboard!).

One method we did experience some problems with however was the 'low-tide' method. Wading through shallow water along the reef flats in search of turtles trapped in shallow pools, means putting oneself at risk for shark bites by the numerous "black tips" and lemon sharks (not to mention the poor protection which jelly shoes offer against venomous stings and bites from other less conspicuous animals found on the reef flat). I have been charged by several black tips myself during low-tide on Aldabra. None of the sharks were ever provoked; they simply appeared attracted to the movement of wading feet. We had to carry sticks to ward them off whenever they charged for our feet.

Nevertheless, a total of 85 and 62 immature *E. imbricata* and *C. mydas* were captured and released in 2000 and 2001, respectively. The turtles were tagged, measured, weighed and sampled for DNA before their release. Whenever a previously tagged turtle was caught, it was re-measured and weighed in order to obtain information on growth. In 2001, new tags were applied to 33 of the turtles, while the remaining 29 had already been tagged from previous in-water work. There were 16 previously tagged turtles out of the total 85 captured in 2000.

## **1.4 Subsistence fishing**

All fish caught for consumption on Aldabra were identified, counted and weighed. The data were computerised with catch summaries included in RO monthly reports and forwarded every two months to the Seychelles Fishing Authority (SFA).

Annual fish catch presented in the previous two RO annual reports ran from June to May. To ease comparisons with previous datasets, the annual fish catch is here also reported from June to May.

Unfortunately, some of the catch went unrecorded during my annual leave in July-August 2001, and the total numbers (719) and weight (1815 kg) recorded from May 2001 and up to present (February 2002) are therefore underestimates of the total catch.

Between May 2000 and June 2001, there were a total of 1210 fish (48 different species) caught for subsistence purposes on Aldabra. This amounted to a total weight of 2893 kg, which is some 1500 kg greater than in 1999-2000 and also the largest catch recorded since 1996 (Table 9.). Although prohibited, according to the Aldabra Management Plan (section 3.3.2.), SIF permitted the harvesting of another 5390 kg of fish during the Scientific Workshop and AGM in December 2000. The catch, which consisted mainly of *Lutjanus bohar*, *Cheilinus undulatus*, *Lethrinus nebulosus*, and various species of Groupers, including *Epinephelus tukula*, *E. polyphekadion*, *E. multinotatus*, *Variola louti* and *Plectropomus spp.*, was brought back to Mahé where we were informed that it was apparently sold. The **total** harvesting of fish (including subsistence fishing) along Aldabra's coastline was therefore over 8 tonnes(!) in 2000-2001.

Based on the very limited data we currently have acquired on catches around Aldabra, this figure was found to exceed the **theoretical** maximum sustainable yield (MSY) derived from a *Shaeffer Analysis* (carried out on our catch data set available from 1996 to present only).

Time	Catch $Y_E$	Effort $f_E$	Catch per Unit Effort $U_E$
Year	Kgs	Trips	kgs/trip
1996-97	2645.8	37	71.5
1997-98	2755.8	37	74.5
1998-99	1957.1	25	78.3
1999-00	1394.0	32	43.6
2000-01	2892.8	44	65.7

**Table 9.** Annual **subsistence** fish catch, number of trips and CPUE.

Considering the limited dataset available it is difficult to draw any firm conclusions regarding the state of the Aldabra residential fish populations. As far as illegal fishing activities are concerned it is also extremely difficult, with the large area of the atoll and limited number of staff and facilities available, to assess the true level of fishing pressure around Aldabra Atoll.

However, concerning the safekeeping and future status of Aldabra as a UNESCO world heritage site with its hitherto comparatively unspoilt natural beauty and environment, I would strongly recommend that a precautionary approach be taken by SIF. The regulations set out in the Aldabra Management Plan need to be respected by all. I would also suggest that

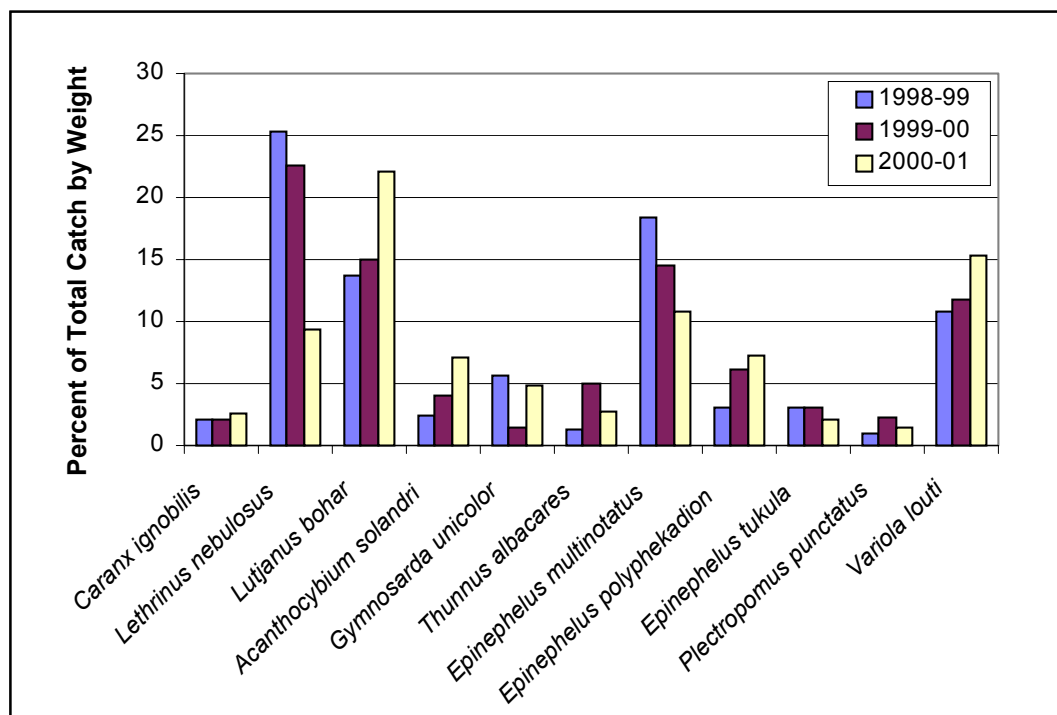
funds be secured for more effective monitoring and increased control of illegal fishing activities as well as other poaching of wildlife that may be occurring around the atoll.

As evident from Table 10, which summarises the annual catch by species, there are four species that make up over 50% of the total subsistence catch on Aldabra. These include *Epinephelus multinotatus* and *Variola louti* from the Grouper family, *Lutjanus bohar* from the Snapper family, and *Lethrinus nebulosus* from the Trevally family. Over the past three years, from 1998 to 2001, the *L. nebulosus* and *E. multinotatus* catch has decreased from 25.4% to 9.3% and 18.4% to 10.7%, of the total fish catch, respectively. The catch of *L. bohar* and *V. louti*, on the other hand, has increased from 13.7% and 10.8% of the total catch in 1998-1999 to 22.1% to 15.3% of the total catch in 2000-2001.

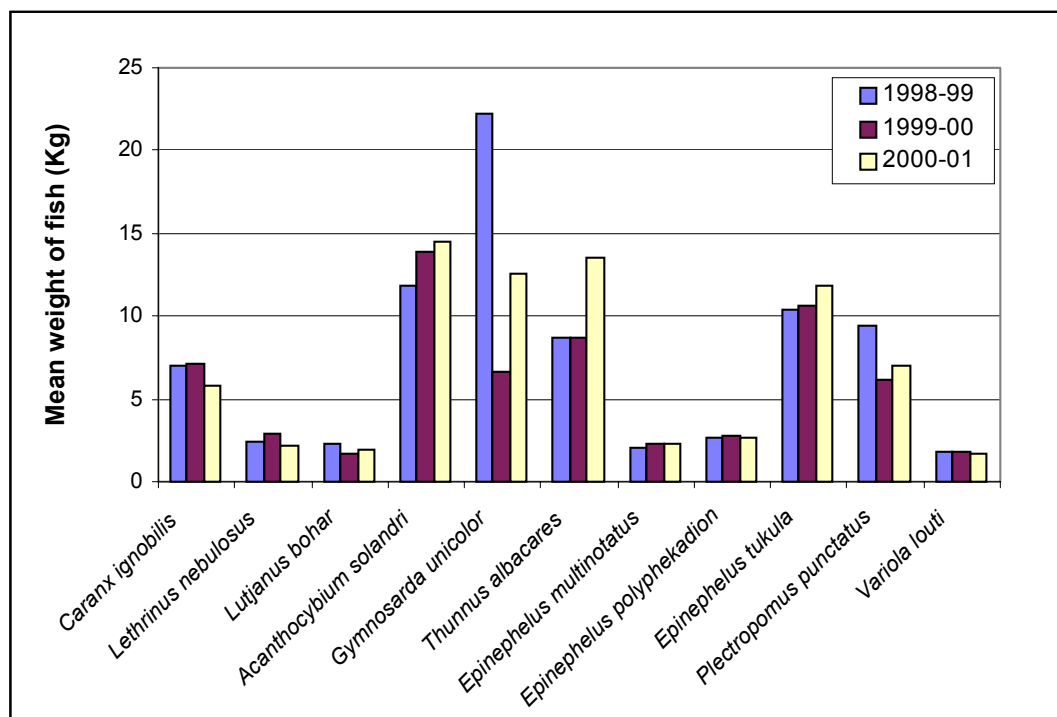
Family	Species	Number caught	Total Weight (kg)	Mean Weight (kg)	% of Total Catch by Weight
Balistidae	<i>Balistoides viridescens</i>	2	5.3	2.7	0.2%
	<i>Sufflamen fraenatus</i>	2	2.7	1.4	0.1%
	<i>sp.?</i>	2	3.7	1.9	0.1%
Carangidae	<i>Caranx ignobilis</i>	13	75.4	5.8	2.6%
	<i>Caranx melampygus</i>	6	16.9	2.8	0.6%
	<i>Caranx sp.</i>	1	4.5	4.5	0.2%
Haemulidae	<i>Plectorhinchus sordidus</i>	1	3.2	3.2	0.1%
Holocentridae	<i>Sargocentrum sp.</i>	2	2.6	2.6	0.09%
Labridae	<i>Cheilinus undulatus</i>	1	15.5	15.5	0.5%
Lethrinidae	<i>Lethrinus borbonicus</i>	7	6.5	0.9	0.2%
	<i>Lethrinus nebulosus</i>	122	270.1	2.2	9.3%
	<i>Lethrinus sp.</i>	2	1.5	0.8	0.02%
	<i>Lethrinus rubrioperculatus</i>	44	45.4	1.0	1.6%
	<i>Lethrinus xanthochilus</i>	2	5.4	2.7	0.2%
	<i>Lethrinus olivaceus</i>	5	19.7	3.9	0.7%
Lutjanidae	<i>Aprion virescens</i>	13	40.8	3.1	1.4%
	<i>Lutjanus bohar</i>	329	639.0	1.9	22.1%
	<i>Lutjanus gibbus</i>	44	41.3	0.9	1.4%
	<i>Lutjanus kasmira</i>	1	0.5	0.5	0.02%
	<i>Lutjanus rivulatus</i>	1	6.8	6.8	0.2%
	<i>sp?</i>	3	12.2	4.1	0.4%
Scombridae	<i>Acanthocybium solandri</i>	14	203.0	14.5	7.0%
	<i>Gymnosarda unicolor</i>	11	137.9	12.5	4.8%
	<i>Thunnus albacares</i>	6	80.8	13.5	2.8%
	<i>Euthynnus affinis</i>	3	6.4	2.1	0.2%
Serranidae	<i>Aethaloperca rogaa</i>	4	8.7	2.2	0.3%
	<i>Cephalopholis miniata</i>	28	23.9	0.9	0.8%
	<i>Cephalopholis sonnerati</i>	2	3.2	1.6	0.1%
	<i>Epinephelus fasciatus</i>	27	18.8	0.7	0.6%
	<i>Epinephelus fuscoguttatus</i>	8	45.5	5.7	1.6%
	<i>Epinephelus multinotatus</i>	134	310.3	2.3	10.7%
	<i>Epinephelus macrospilos</i>	6	5.0	0.8	0.2%
	<i>Epinephelus polyphekadion</i>	78	209.2	2.7	7.2%
	<i>Epinephelus tukula</i>	5	59.4	11.9	2.1%
	<i>Plectropomus pessuliferus</i>	2	1.4	0.7	0.05%
	<i>Plectropomus punctatus</i>	6	42.1	7.0	1.5%
	<i>Variola louti</i>	261	441.6	1.7	15.3%
	<i>sp?</i>	8	40.2	33.4	1.4%
Sphyraenidae	<i>Sphyraena barracuda</i>	3	22.8	7.6	0.8%
Others	<i>Etelis marshi</i>	1	13.6	13.6	0.5%
<b>Total</b>	<b>48 species</b>	<b>1210</b>	<b>2893</b>		<b>100.0%</b>

**Table 10.** Subsistence fish catch on Aldabra, June 2000 – May 2001.

Nearly 90% of the total catch is represented by some 11 species of fish. Their individual fractions of the whole catch over the past three years are illustrated in Figure 28, while their mean weights recorded over time are shown in Figure 29.



**Figure 28.** Most commonly caught species making up most (nearly 90%) of the fish catch on Aldabra.

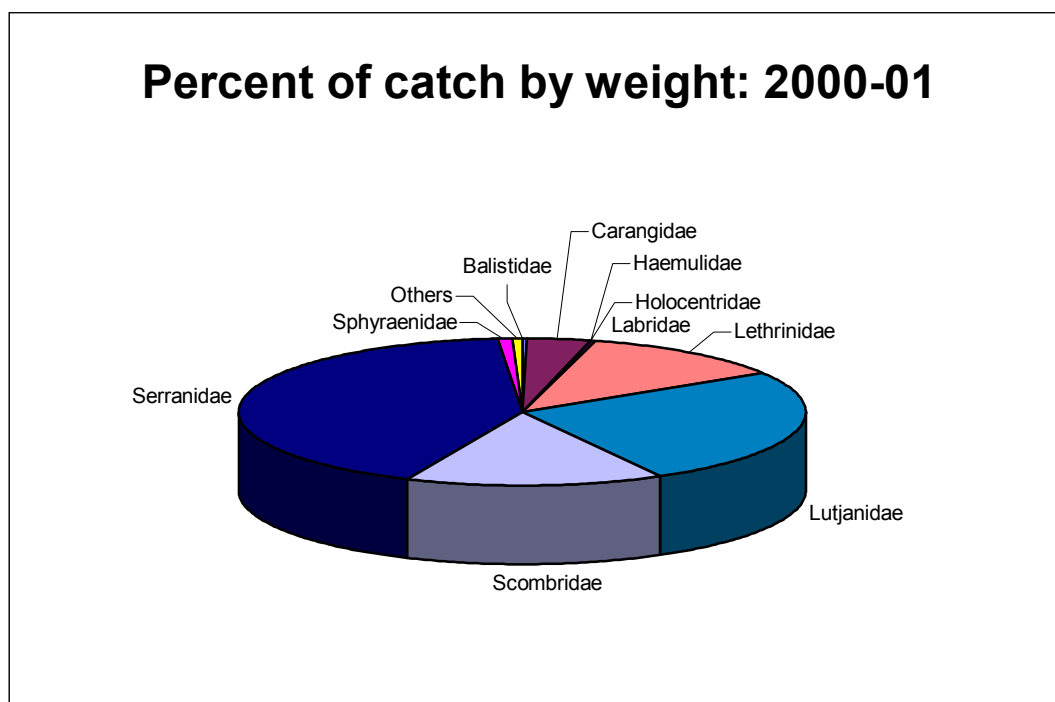


**Figure 29.** Mean weight of the most commonly caught species on Aldabra.

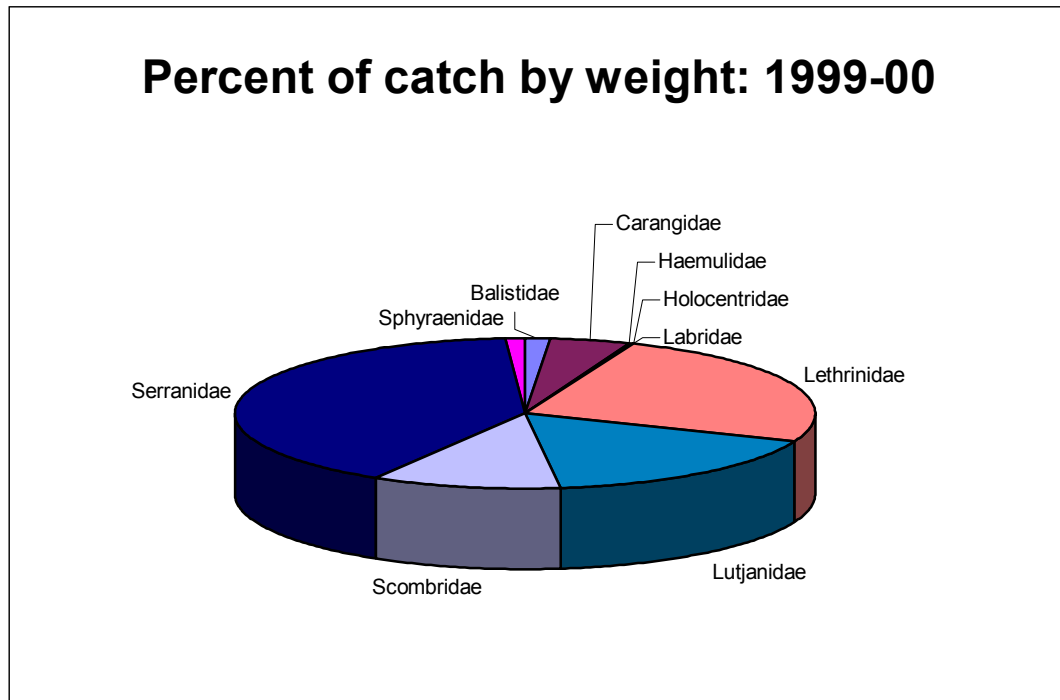
Including the less commonly caught species, the entire fish catch on Aldabra consists of species belonging to some 10 families of fish. The numbers and weights corresponding to each family have been summarised in Table 10 for the time period June 1999 – May 2001, with a break-down of the percentages of the total annual catch shown in Figures 30-31.

Family	June00-May01 Number caught	June00-May01 Total Weight (kg)	June99-May00 Number caught	June99-May00 Total Weight (kg)
Balistidae	6	11.7	10	18.4
Carangidae	20	96.8	16	63.2
Haemulidae	1	3.2	1	1.7
Holocentridae	2	2.6	1	0.9
Labridae	1	15.5	1	0.7
Lethrinidae	182	348.6	135	348.5
Lutjanidae	391	740.6	137	237.5
Scombridae	34	428.1	15	144.8
Serranidae	569	1209.3	251	561.0
Sphyraenidae	3	22.8	3	17.3
Others	1	13.6		
<b>Total</b>	<b>1210</b>	<b>2893</b>	<b>570</b>	<b>1394</b>

**Table 10.** Numbers and weight of catch represented by each fish family, June 1999 – May 2000 and June 2000 – May 2001.



**Figure 30.** Percentage of total catch by weight represented by each fish family, June 2000 – May 2001.



**Figure 31.** Percentage of total catch by weight represented by each fish family, June 1999 – May 2000.

### 1.5 White-throated Rail *Dryolimnas cuvieri*

The frequency and methodology of rail monitoring went through quite a few changes throughout the report period. Since January 1999 and up to May 2001 transect counts were carried out on a monthly basis, according to the method initially set up by Michael Betts. The Scientific Sub-committee considered the frequency excessive and, following discussions with Ross Wanless, it was decided that rail monitoring should follow the Huxley method to allow for comparisons with earlier rail population estimates.

The method implemented by Betts has been described in the 1999-2000 RO report. Major differences between the two survey methods include the time of day counts are carried out, distance between each point count along the transect, manner of attracting the rails, the recording of rails both seen and heard *versus* rails seen only, and duration spent at each point along the transect.

With the Betts method rail calls are produced either by tape or through whistled imitation for a total duration of 30 seconds (2x15 seconds) at each

point count, while 60 seconds (2x30 seconds) are spent listening and observing at each of the points, which are spaced at 100m intervals. With the method adopted in May 2001, rail calls (produced by taped rail vocalisation only) are played for up to 5 minutes at each point. Only rails seen are recorded (excluding any heard within the transect) and a total of two minutes are spent observing at each of the points, which are spaced 50m apart. Finally, the transect counts initiated by Betts are carried out in the afternoon (after 1600 hrs), while the Huxley method is carried out after 07:00 in the morning.

Having carried out both methods, I have my reservations regarding the new method, which was recently adopted for long-term monitoring of the rail population on Aldabra. It soon became apparent to both myself, as well as the Aldabra rangers, that duplicate and triplicate counts were quite often made of the same bird along a given transect (as confirmed by ringed rails appearing at consecutive points along the transect). The risk of over-counting birds may be amplified by the shorter intervals between survey points and also the longer duration of tape playing (up to 5 minutes) at each point. This is not a major concern when dealing with ringed birds, but with un-ringed birds there is a danger of producing an over-estimate of rails.

Furthermore, the shorter point-count intervals and longer maximum duration of taped vocalisations at each of the points have more than doubled the amount of time it takes to complete a transect. This has proven to be a bit of a problem at locations accessed during a single high tide (i.e. Polymnie and Gionnet). Gionnet, being a relatively short transect (400m), remained quite manageable, while rail monitoring at Polymnie (900m) went from a total duration of 15 minutes to a maximum of 95 minutes spent playing the taped vocalisation and making observations along the individual points along the transect. This does not include the time spent walking between the individual points, and means that a transect which previously could be completed within approximately 30 minutes currently takes monitoring staff around two hours to complete. Including the travel time by boat to study sites, at least three hours are needed for the Polymnie transect and any delay could easily cause the party to miss the tide and become stranded inside the lagoon. I would suggest that the length of the transect be shortened somewhat at Polymnie and possibly also at Anse Malabar (currently 1000m), if the new method is to continue as the standard procedure for rail monitoring.

The counts obtained using the two methods are summarised in Table 11. Note that the counts in brackets include rails both heard and seen, while the remaining figures include rails seen only.



	Gionnet	Polymnie	Middle Camp	Anse Malabar	Method
Jan-01	x	X	8 (13)	4 (16)	Betts
Mar-01	2 (02)	3 (07)	7 (09)	1 (03)	Betts
Apr-01	0 (04)	2 (03)	2 (07)	1 (13)	Betts
May-01	11	7	15	X	Huxley
Jun-01	7	3	7	4	Huxley
Aug-01	5	6	11	6	Huxley
Oct-01	3	5	10	5	Huxley
Dec-01	2	13	8	16	Huxley

**Table 11.** Numbers of *Dryolimnas cuvieri* observed along transects in 2001. Figures in parentheses include counts of rails both seen and heard within the transects, while the remaining figures reflect the numbers of rails seen only.

### 1.5.1 Field Observations on Picard Population

During the 2001-02 breeding season, rangers, warden and research officer were involved in tracking down rail territories and breeding attempts made by the ever-increasing rail population on Picard. Rangers Camille Hoareau and Terence Mahoune put particular effort into this work. Records (format provided by R. Wanless) were kept on any observations made on pairing, breeding attempts, location and habitat type of territories and nests, clutch size (if possible to obtain without displacing the incubating bird), surviving young, and the overall monitoring intensity. Incubating birds were first observed in November 2001. By February 2002, a total of 11 pairs of rails and territories/nest sites had been identified (Appendix 3), and two pairs of rails were successfully raising their second clutch of chicks for the breeding season. Territories observed were scattered all over Picard and extended from La Gigi in the South to Anse Var in the North and as far East as Bassin Lebines. Habitat type varied amongst the different territories, as did the type of material used for building nests and their location/height above ground.

### 1.5.2 Injured birds

Three birds (YA1, YA8, and YA9) were observed to be limping, though the cause could not always be determined. In the case of YA1 it was the plastic colour ring causing problems as it had slid down and produced a very swollen leg. The bird was limping badly and we had no choice but to remove the ring. As a result, there are currently two birds on Picard, which have had their plastic rings removed. These are YA1 and Y20 (ring removed by R. Wanless); two of the initial group of birds introduced to Picard during the 1999-00 breeding season. The metal rings are still in place on both birds, however.

## 1.6 Coccids *Icerya seychellarum*

The six coccid transects were monitored twice per year; once in the wet season and once in the dry season. Plant species included *Sideroxylon inerme* (Middle Camp and Gionnet), *Avicennia marina* (Cinq Cases and La Gigi), *Ficus lutea* (Cinq Cases) and *Euphorbia pyrifolia* (Anse Var). Labelled trees within each transect were assessed for levels of plant death and coccid infestation. The median score following each survey occasion since 1998 can be viewed in Figures 32-36. A sign test was also carried out in order to determine the statistical significance of any observed changes over time.

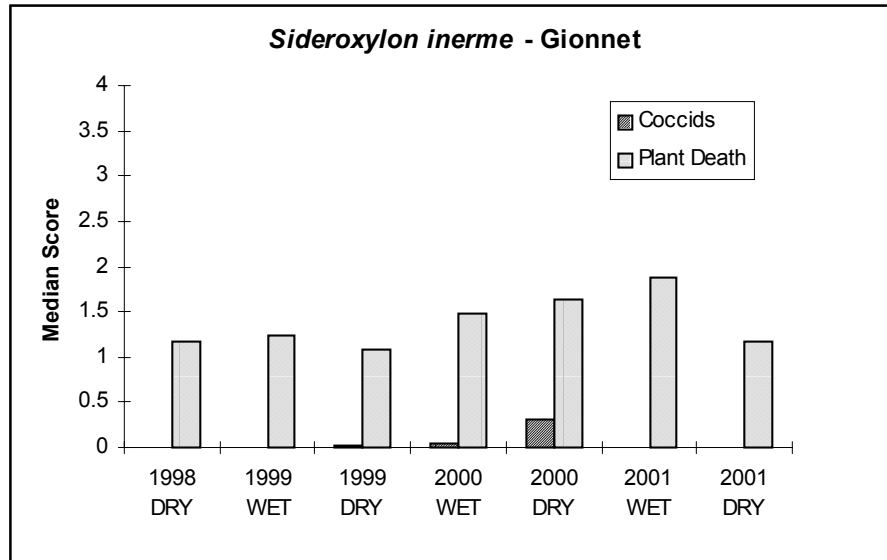
### 1.6.1 Changes in Coccid Infestation Levels and Plant Death

There were no coccids recorded ever along the *E. pyrifolia* transect. Coccids were rarely recorded on *S. inerme* and only at very low infestation levels in 1999-2000 Gionnet and the 1999 wet season only at Middle Camp. Levels of coccid infestation varied in *F. lutea*. Comparing the results from the last survey during the 2001 dry season with those of the 2000 dry season it was revealed that a statistically significant decrease in infestation levels had occurred in *F. lutea*. There had been no statistically significant change between the same two survey periods in *A. marina* at Cinq Cases, while a significant decrease had occurred in *A. marina* at La Gigi. This can probably be attributed at least partly to the fact that several of the sample trees previously infested along that transect are now dead. It is not known whether *I. seychellarum* has been the causal factor in the death of these trees. This is probably doubtful for two main reasons. The Infestation levels recorded were never very high and perhaps more importantly the median scores were even somewhat lower than those recorded for the same species of mangrove in the Cinq Cases area where there had been no increase in plant death observed over the years. This suggests that other factors must have been involved. Inspecting the mangrove area surrounding the La Gigi transect, it was concluded that the death was limited to a very small area around the transect location.

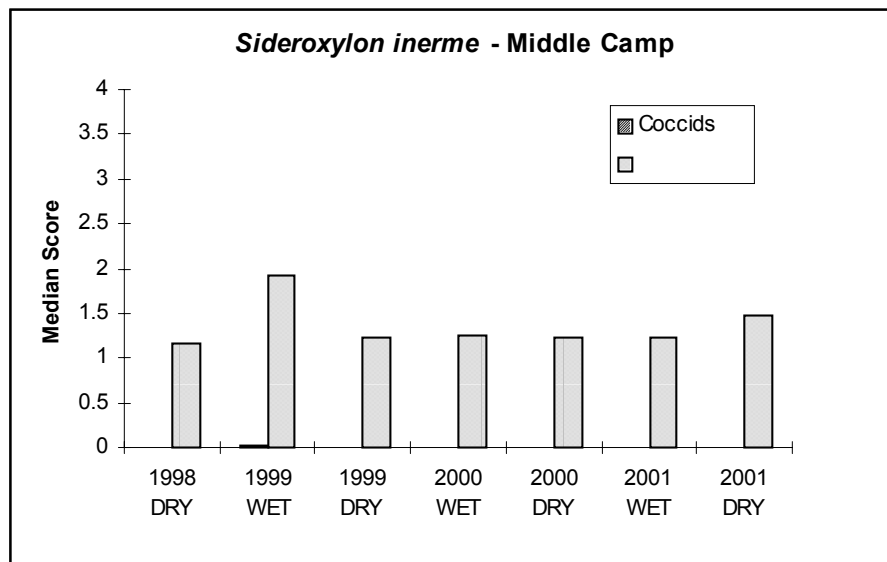
Comparing the dry seasons from 1999 to 2001, a statistically significant change in plant death had occurred in two plant species. These were in *F. lutea* at Cinq Cases where a decrease in plant death had occurred since 1999, and in *A. marina* at La Gigi where, as already mentioned above, an increase in plant death had occurred. New trees will need to be selected if the monitoring at La Gigi is to continue.

### 1.6.2 Coccinellid *Rodolea chermesina*

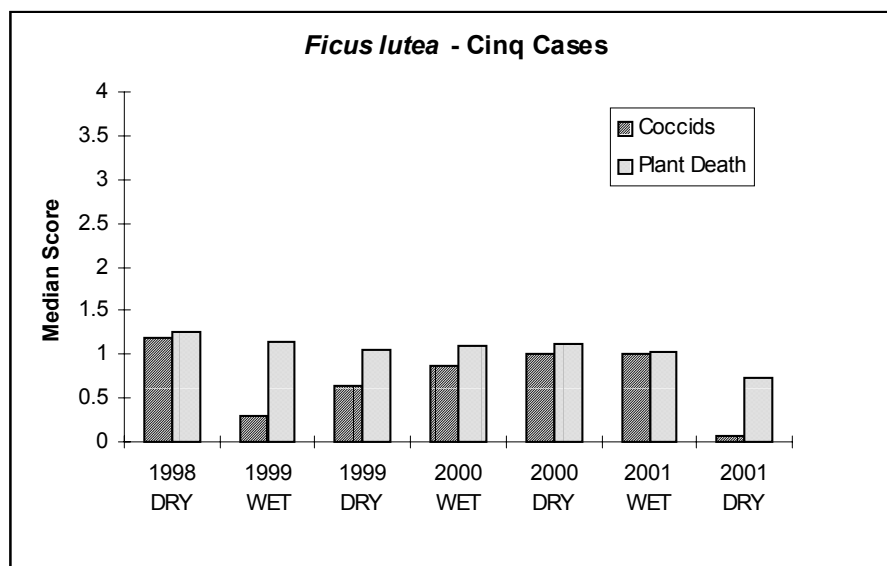
*R. chermesina* was observed very rarely and always during the wet seasons (with the exception of one observation made on *F. lutea* in the 2000 dry season). Median scores were minimal and ranged from 0.02 to 0.15.



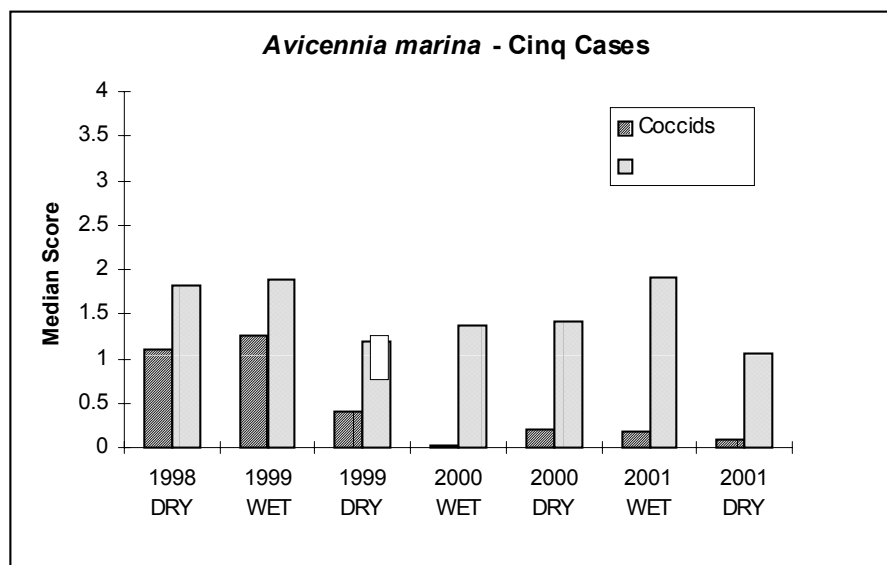
**Figure 32.** Median scores of plant death and coccid infestation levels observed on *S. inerme* along Gionnet coccid transect, Malabar Island, 1998 – 2001.



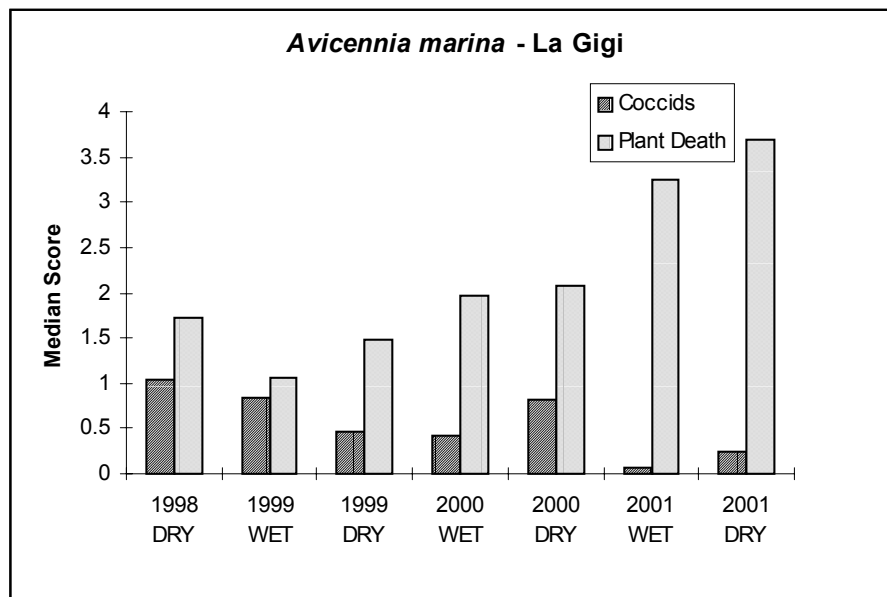
**Figure 33.** Median scores of plant death and coccid infestation levels observed on *S. inerme* along Middle Camp coccid transect, Malabar Island, 1998 – 2001.



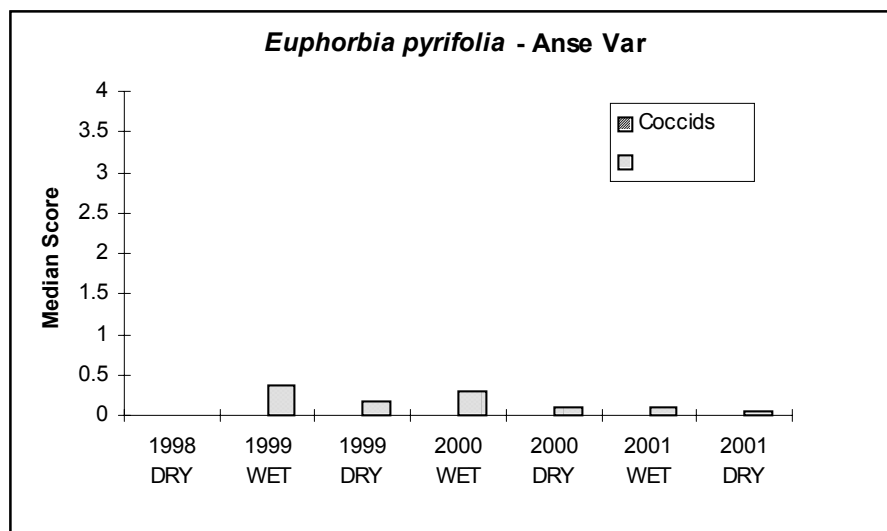
**Figure 34.** Median scores of plant death and coccid infestation levels observed on *F. lutea* along Cinq Cases coccid transect, Grande Terre, 1998 – 2001.



**Figure 35.** Median scores of plant death and coccid infestation levels observed on *A. marina* along Cinq Cases coccid transect, Grande Terre, 1998 – 2001.



**Figure 36.** Median scores of plant death and coccid infestation levels observed on *A. marina* along La Gigi coccid transect, Picard Island, 1998 – 2001.



**Figure 37.** Median scores of plant death and coccid infestation levels observed on *E. pyrifolia* along Anse Var coccid transect, Picard Island, 1998 – 2001.

## 1.7 Beach Erosion

The current method of assessing beach erosion along Settlement beach is probably not the most accurate or scientific approach to picking up signs of erosion or accretion (2000-2001 RO report). The method, which relies on very crude measurements taken perpendicularly to shore (between a permanent marker post and the vegetation edge) using a tape measure, is only useful for picking up major changes in beach erosion/accretion. However, as long as the limitations of the method are recognised, the beach surveys may still (together with photographs) provide interesting documentation of the more obvious long-term trends in the vicinity of the marker posts.

Surveys were carried out twice per year during a spring low tide, once in the wet season and once in the dry season. Digital photos were taken seaward immediately above the marker post and also landward of the marker post. These images are stored on the Station Computer (Dell) together with those taken in September 2001. Location: E:\Images\Digital Camera Aldabra\Beach Erosion Study. Measurements taken during each survey have been computerised with copies forwarded to SIF. Hard copies of data are also stored in the station library file cabinet.

The measured migration, since 1999, of the beach edge (defined as the vegetation-edge by this survey method) at the 13 marker posts, shown in Table 12, illustrate some of the shortcomings of the beach survey method in place. The marker locations extend from marker post 1 at the northern-most end of Settlement beach and southward to marker post 12 at the southern-most end of Settlement beach and marker post 13 even further south in front of the research officer's house. The figures in Table 12 are based on measurements made in February 2002 when we were having severe problems with erosion of the old settlement cemetery area which is located right in front of the beach at the northern end of Settlement beach and near marker 1. Yet the measurements taken near marker 1 indicate a net accretion of sediment, rather than erosion. This is no doubt due to the fact that the vegetation type chosen as a demarcation of the beach edge at marker 1 consists of a *Casuarina* tree sitting well above the beach on top of a champignon outcrop. Any sediment movement occurring below thereby goes undetected by the tape measure. In such cases, photographic documentation may be more valuable.

With a digital camera currently available for Station use, qualitative assessments in terms of photographic evidence of beach erosion/accretion will now be much easier than in the past when rolls of film had to be sent to Mahé for developing. Even short-term changes could easily be documented, if needed. The cemetery at the old Settlement may be an area of particular interest, especially since a considerable amount of effort has gone into building a barrier to prevent turtles from adding to the erosion problem.

Marker post	Accretion (m)	Erosion (m)
1	+0.7	
2	+0.1	
3	+2.4	
4		-2.3
5	X	X
6		-0.1
7	+2.6	
8		-0.6
9	+2.5	
10		-0.6
11	0	0
12		-6.5
13	+0.2	

**Table 12.** Migration of the beach edge since 1999, Settlement Beach marker posts 1-13. x indicates instance where measurements could not be taken, since a vegetation edge could not be identified.

Near marker 12 the obvious signs of erosion cannot be questioned. Trees have fallen down, the fish-shed been dismantled and reconstructed further inland, and the marker post itself (put in place 6 m inland of the beach edge in 1999) has even fallen down due to a loss of sand. Realising that the beach edge was retreating inland quite rapidly, a new marker was placed 3 meters inland of the original marker before it fell over. This was done in September 2000. Before departing Aldabra in February 2002, I placed an additional marker post another 3 meters inland of the second marker post. Consequently, the third and most landward marker post is now positioned 12 meters inland of the original marker post and beach edge location in 1999.

## 1.8 Vegetation Monitoring

Given that the Aldabra tortoises' diet consists mainly of plant material, it is a bit surprising that no ongoing research or long-term monitoring project is carried out on the vegetation of Aldabra. At present, the only monitoring that includes vegetation is that which relates to the coccid transects (i.e. twice-yearly recording of plant death along 6 transect locations).

## **2 OTHER RESEARCH AND MONITORING**

### **2.1 Landbird Point Count**

Point counts of landbirds were carried out by SIF staff along 7 of the already established tortoise transects. This consisted of monthly counts along Middle Camp Inland, Dune Jean-Louis, Dune d'Messe Inland, Cinq Cases Groves and Cinq Coco transects and weekly counts along Bassin Lebines and Backpath transects on Picard.

Data were computerised in Excel with copies forwarded to SIF. Original data sheets are kept on file in the Station library.

### **2.2 Seabird Survey on Lagoon Islets**

As agreed by the Scientific Sub-committee, the monitoring by Station staff of breeding activity of seabirds found on islets in the lagoon was terminated in August-September 2001. The main reasons for this were disturbance to highly sensitive species of nesting birds, structural damage to the islets while landing by boat, and physical harm to monitoring staff during landing attempts.

The data gathered have been computerised in MS Works (2000 dataset) and Excel (2001 dataset), but remain to be analysed. The frequency of the surveys consisted of monthly visits to the islets, whereupon the labelled nests were examined for the presence of eggs or chicks (including development stage). The 4-week long interval between each census poses some limitations to the type of conclusions that may be drawn in terms of breeding success, as it is difficult to determine whether an empty nest indicates that chicks have actually fledged or if they were predated. Some major assumptions have to be made. Also, eggs could have been predated and re-layed between survey occasions, making it difficult to determine accurate figures of hatching success.

### **2.3 Ship Rat *Rattus rattus***

Since 1998 there have been over 700 rats trapped and killed in the vicinity of the Station. A total of 151 of those were trapped during the period of this report. The method of killing was by drowning. Once the rats had dried, they were then weighed and measured. The sex was also determined on rats weighing more than 90g. Out of all the rats caught, 125 were classified as adults and the sex ratio was 6 males to 5 females. Mean weight was 146g for males and 123g for females. Previous figures given in the 1999-2000 RO report were 147g for males and 126g for females. No other species than *R. rattus* were observed.

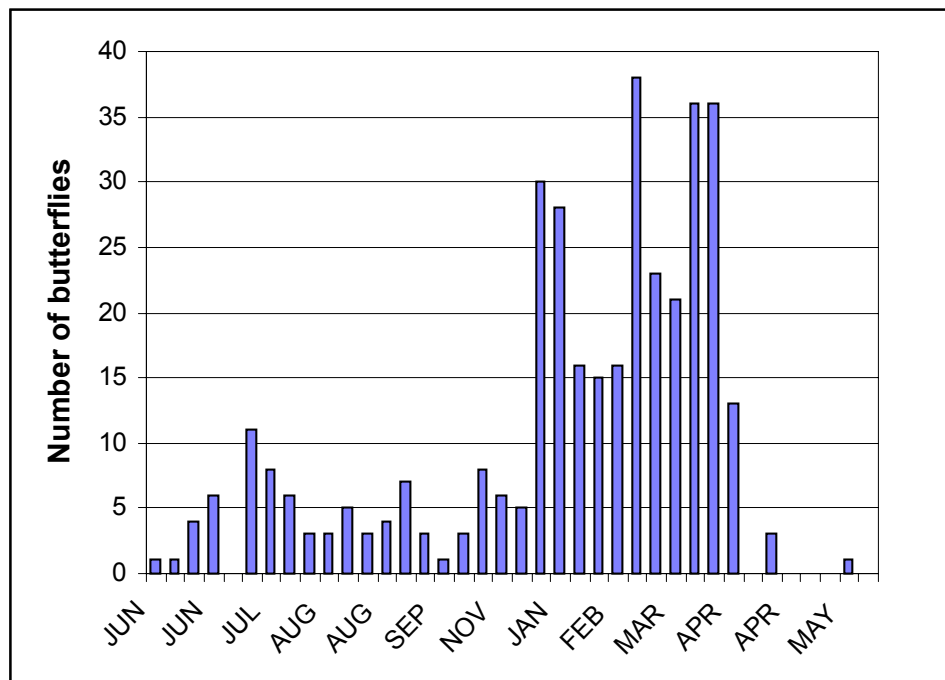


Following a documentary (filmed on Aldabra in March 2001) in which the method of killing the rats by drowning was aired on TV, we were contacted by the animal rights activist group PETA who demanded that we either immediately cease killing the rats or start using lethal injection as a more humane alternative.

## **2.4 Butterflies**

The weekly counts of butterflies, initiated by Michael Betts, continued along the Station backpath in conjunction with the early morning monitoring of landbirds. All species of butterflies seen within a width of 5 meters were recorded, along with details on location along the 1950m long transect. Although, it was shown that the most ideal time of monitoring is between 10:00-14:00 (Betts 2000), priority was given to other aspects of the monitoring programme and butterfly data were gathered while walking between landbird point counts, which is inevitably between 07:00 and 08:00 in the morning. If there are sufficient monitoring staff members available, it would be better to carry out the counts later in the day - as stated above.

The total counts of all species of butterflies counted along the backpath transect are shown in Figure 38.



**Figure 38.** Total numbers of butterflies observed along the Station backpath in June 2000 – May 2001.

Altogether, there appears to be a prominent rise in numbers of butterflies during the months of the rainy period.

## 2.5 Frigatebird disturbance counts

The only frigate bird colonies open to visitors are the ones located at Gionnet (colonies A and B). Monitoring the impact of visits to the colony is a high priority, since frigate birds are extremely vulnerable to nest-robbing and susceptible to disturbance. A description of the method used for disturbance monitoring is given in the 1999-2000 RO report. Disturbance monitoring requires at least 2 staff members carrying out counts while the boat is in motion (i.e. 3 staff including the boatman). Counts were considered a high priority, but not always possible when staff were tied up in other areas with other activities or visitors. The numbers of birds taking flight during visits are shown in Table 13.

Date	Colony A Birds at rest	Colony A % Birds disturbed	Colony B Birds at rest	Colony B % Birds disturbed	No. of boats
5/9/00	x	x	350	5.7	1
15/10/00	281	37.0	185	21.6	2
19/10/00	190	29.1	173	24.5	2
21/10/00	x	x	x	X	1
27/10/00	x	x	x	X	1
30/10/00	x	x	x	X	2
15/11/00	256	15.2	x	X	1
25/03/01	678	20.0	350	7.4	1
5/4/01	77	33.6	61	23.8	2
13/07/01	420	10.6	261	38.6	1
10/11/01	80	57.2	122	35.1	2
19/11/01	217	43.9	71	76.7	1
26/11/01	147	24.2	75	46.8	1

**Table 13.** Percentage of birds taking flight during visits to Gionnet frigate colonies A and B. x indicates 'no visit to the colony' or 'no disturbance count carried out'.

## 2.6 Drongo Study

Mr. Joseph Francois (Ministry of Environment) visited Aldabra to study the breeding biology and success of the endemic Aldabra Drongo, *Dicrurus aldabranus*, during the 2000-2001 landbird breeding season. Rangers and other Station staff were able to join him in the field and benefited greatly from his visit to the atoll. The work will be published in the near future by Mr. Francois and we look forward to reading about the status of this magnificent bird.

## **2.7 Landbird Blood Sampling**

Seizing the opportunity to come ashore, while in the vicinity of Aldabra atoll, Ornithologist Dr. Gerard Rocamora spent a few days with us on his return journey from Cosmoledo where he had been carrying out work on the landbirds. This was not a planned visit to Aldabra, but permission to land was granted by SIF. Permission was also given by SIF to carry out biometrics and blood sampling on the turtle doves of Aldabra. We were able to join Dr. Rocamora in his work and were able to learn about the procedures involved in bird trapping and blood sampling.

## **2.8 Aldabra Rails**

Mr. Ross Wanless returned during the 2000-2001 breeding season to carry out work on the White-throated Rail *Dryolimnas cuvieri*. Assisting him in the field was Mr. Richard White. Rangers were also able to join him for a day in the field. Work focused largely on relocating the birds, which had been re-introduced to Picard Island in 1999-2000, and also their offspring. As territories and nests were found, observations on breeding behaviour and biology were made.

Monthly progress reports were produced and a final report was forwarded to the Station library.

## **2.9 Landbird breeding success**

Ross Wanless and Richard White started monitoring the breeding success amongst Aldabra's landbirds quite intensively during their stay on Aldabra in the 2000-2001 breeding season. After some time, it became apparent that in addition to their work on the rails, the contents of a large number of other landbird nests were also being checked on a regular basis. This was never cleared in advance with the Scientific Sub-committee, and this work was not requested by myself to be carried out. The project, referred to as the *Aldabra Nest Record Scheme*, was however discussed with the Scientific Committee upon their return to Mahe. Copies of the data have been left in the library/research block on Aldabra Station.

## **2.10 Tortoises**

We had several visits by individuals conducting work on the Aldabra tortoise. Mr. Adam Moolna (Durham University student) studied climate and environmental impacts on tortoise behaviour, Dr. Franck Bonin (SOPTOM) with field assistant Beatrice Querette collected tortoise faeces samples, Ms. Sally Cersosimo (Atlanta Zoo) made behavioural observations for improving

the living conditions of captive tortoises and Mr. Bernard Devaud (SOPTOM) gathered information and photographs for a monograph on tortoises.

## **2.11 Turtles**

Dr. Jeanne Mortimer visited Aldabra in March-April 2001 to carry out intensive in-water work on immature turtles and to gather information on habitat and feeding grounds. Assisting her in the field was SIF ranger Mr. Tony Jupiter and Mr. Maxwell Delcy.

During a visit to the atoll in December 2000, Dr. Mortimer initiated a project on the hatching success and incubation temperature of turtle nests on Aldabra. Automatic temperature loggers and guidelines were provided and station staff, rangers and research officer have all been involved in one way or another in the fieldwork for this study. There are currently seven loggers collecting temperature of the sand at 4 different beaches on Aldabra. These include Settlement Beach, Anse Petit Malabar, Anse Dune Jean-Louis and Anse Mais. Details on their specific location are kept at the Station and on the research officer's computer, as they will need to be relocated by August 2002 when they expire.

A dead immature green turtle was found on the reef flat in front of Passe Dubois. It was brought back to the Station and a necropsy was performed by rangers and research officer in an attempt to determine the cause of death. Dr. Mortimer kindly provided a Sea Turtle Necropsy Manual and it was a great educational experience for all monitoring staff. There were no foreign objects found inside the trachea or alimentary canal of the turtle, nor were there any signs of physical damage (e.g. propeller marks). This made it difficult to determine the cause of death.

## **2.12 Coral Reefs**

The Aldabra Marine Programme (AMP) group of marine scientists made two expeditions to the atoll during the period of this report. Data were gathered on reef fish, corals and echinoderms along the permanent transects around the atoll. Temperature loggers were deployed in February 2001 and retrieved one year later in February 2002 (section 1.1.5 of this report).

The team was joined by SIF ranger Tina Dubel in 2001 and myself in both 2001 and 2002.

An expedition report with results is in the making and will be forwarded to Aldabra in the near future.

## 2.13 Field observations

### 2.13.1 Bird Sightings

Several members of Station staff and visitors took great interest in noting any unusual sightings of vagrants, annual migrants or other rare birds. A great number of bird sightings were made on Aldabra throughout the report period and have been listed by species below.

#### HEADLINE NEWS!

In addition to all of these sightings, ranger Camille Hoareau claims to have seen the Aldabra warbler (presumed to be extinct) during a visit to West Grande Terre on 18/01/02. The bird in question could not be found again during a second trip to the same location the following day. This was probably only because the camera was brought along the second time...

Observer:	Bird species and Notes:
BB/SB/AL	<b>Sand Martin</b> <i>Riparia riparia</i> One bird flying back and forth nearby WGT beach 1 on 05/10/00
AL/MA	<b>Mascarene Martin</b> <i>Phedina borbonica</i> Two adults along Station Backpath on 12/10/01
BB/SB RWW AL/AC/MA CS/GE/AL MA	<b>Broad-billed Roller</b> <i>Eurystomus glaucurus</i> Bird was seen flying past Bch 21 on 25/10/00 One on Backpath, yellow marker 10 on 25/03/01 One adult observed at Station on 23/10/01 and 25/10/01 One bird flying East over Anse Var observed on 10/11/01 One bird observed near hut at Dune d'Messe on 05/12/01
All Station Staff	<b>European Turtle Dove</b> <i>Streptopelia turtur</i> One adult first observed on 01/11/01 remained at the Station throughout most of the month of November
AC/BB MLL AS AS BB RW/RWW	<b>Tree Pipit</b> <i>Anthus trivialis</i> One bird seen at Anse Mais on 23/11/00 One bird at the Old Settlement seen at 17:45 on 04/12/00 One at the Old Settlement at 08:25-08:40 on 05/12/00 Seen again in same location as above at 08:45 on 06/12/00 One bird along the path from Station to La Gigi on 22/12/00 One bird along the path from Station to La Gigi on 25/12/00

AC/JF	One bird seen between Beach 18 and 19 on 06/01/01
RW	Old Settlement on 07/01/01
TM/AC	One bird observed at the Station on 17/11/01
G. Rocamora	Bird sighted at the Old Settlement on 18/11/01
AL	One bird observed at Old Settlement on 05/12/01
MH/TD	One bird seen foraging amongst Casuarina needles at Old Settlement on 24/12/01

**Little Swift *Apus affinis***

RW/RWW	One bird flew over Settlement on 02/01/01
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**Northern Wheatear *Oenanthe oenanthe***

AC/AL/RW/RWW/JF	One bird observed at Bch 14-15 Anse Mais on 04-05/01/01
RWW	Female/imm at old settlement on 11/01/01
RWW	Bassin Lebine trail near tortoise flat on 20/01/01
RW	Observed at Old Settlement on 02/02/01
RWW	Station backpath on 04/02/01
MA/AL/PB	One bird at La Gigi on 28-29/01/02

**Yellow Wagtail *Motacilla flava***

AL/AC/JF/RWW	One bird at Dune d'Messe camp on 28/01/01
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**White Wagtail *Motacilla alba***

AL	One bird spotted on platin flat near Bassin Cabri on 03/11/01
AL/AC	One bird observed at the Station on 04/12/01

**Eleonora's Falcon *Falco eleonora***

BB/GE/AC/PB	One between Dune Jean-Louis and Dune D'Messe 29/12/00
RW	Eleonora's Falcon? Over Bassin Lebine on 08/01/01
MH/GE	One bird (chasing Turnstone) at Old Settlement on 09/01/02
GE	One bird seen Old Settlement on 11/01/02
AL/TD	One bird flying over Station area on 11/02/01

**Wattled Starling *Creatophora cinerea***

SB/BB	Three birds seen near Bassin Cabri on 06/09/00
RW/RWW	Five birds flew from Bassin Cabri towards Ibis pool/tortoise flats on 21/12/00
RWW	Two birds at Bassin Lebine trail on 23/01/01
RW/RWW	Four birds near Bassin Lebine on 03/02/01

**Swift species**

RWW	One North over Settlement at 07:10 on 14/01/01
CS/MA/TM/AL	Unidentified swift seen near Anse Mais Camp on 24/10/01
AC	One 'swift-like' bird seen along Station Backpath on 10/12/01

MA/TD	Four birds near mess at Station on 21/01/02-22/01/02
	<b>Barn Swallow</b>
AL	One bird observed near mess at Station on 25/01/02
	<b>Squacco Heron <i>Ardeola idea</i></b>
AC	One between Bch 17 and 18 at 08:15 on 16/03/01
GE/RWW	Two flying over Warden's House 07:00 on 18/03/01
RWW	One on backpath, white marker 35 on 25/03/01
AC	One adult along Cinq Cases Coco transect on 23/04/01
	<b>Brown Booby <i>Sula leucogaster</i></b>
BB/SB/AC/PB/TG	One bird seen in northern region on 22/09/00
AL/AC	One bird observed at Passe Emile on small ilot seaward-side of channel on 08/10/00
BB	Bird seen outside reef Bch Zone 4 on 09/10/00
PB/GE/RW/RWW	One bird at 1 mile west of Pt Cemetery (Picard) 13/02/01
AC	One bird at Passe Femme on 27/05/01
AL	Bird flying over reef off of West Grande Terre on 05/09/01
FA/MA/TM/CS/AL	One adult observed at Main Channel on 08/10/01
	<b>Sooty Tern <i>Sterna fuscata</i></b>
AC	Three birds in middle of lagoon on 21/05/01
	<b>Caspian Tern <i>Hydroprogne caspia</i></b>
BB/SB/AL/TG/PB	Three adults and one juvenile flying above us at Anse Grand Poche on 26/08/01
AL	Four birds on sand flat Picard Bch Zone 4 on 12/09/00
PB	Two birds seen off Picard Reef a.m. on 16/09/00
PB	One adult seen at Grand Cavalier amongst Crab Plovers on 13/02/01
G. Rocamora	One very week immature found on the beach at Station on 18/11/01. The bird died during the night.
	<b>Lesser Crested Tern <i>Sterna bengalensis</i></b>
RW/RWW	Four on Settlement Beach on 31/01/01
RW/RWW	Two on Settlement Beach on 03/02/01 and six on 04/02/01
RWW	Six near Ile Esprit on 23/03/01
	<b>Grey Plover <i>Pluvialis squatarola</i></b>
BB/SB/AL/TG/PB	One adult observed at Anse Grand Poche on 26/08/00
	<b>Bar-tailed Godwit <i>Limosa lapponica</i></b>
BB	Four birds seen at low-tide on 09/10/00
BB/AL	Three birds seen at low-tide on 10/10/00
BB	Twelve birds counted at low-tide on 11/10/00



BB	30 birds seen on sandbar zone 4 on 26/10/00
	<b>Common Ringed Plover</b> <i>Charadius hiaticula</i>
BB	One bird seen at low-tide on 11/10/00
BB	One bird seen feeding on zone 3 on 08/11/00
	<b>Whimbrel</b> <i>Numenius phaeopus</i>
AL	60+ observed at Bassin Cabri at 07:15 on 16/09/00
	<b>Crab Plover</b> <i>Dromas ardeola</i>
BB	70 birds seen on sandbar zone 4
	<b>Common Sandpiper</b> <i>Actitis hypoleucos</i>
RW/RWW	Heard calling at dusk at Station on 22/02/01 and at Middle Camp on 23/02/01
RWW	Six heard by Warden's House p.m. on 14/03/01
	<b>Greater Flamingo</b> <i>Phoenicopterus ruber</i>
AL	Two birds at Bassin Ibis on 31/08/00
AC/PB	Two birds at Bassin Ibis on 30/09/00
BB/SB/PB/AC	Flamingo feather at Ile Michel observed on 30/09/00
BB/SB/AC/TG	Two birds at Bassin Ibis on 29/10/00
AL/AC/PB/RW	Three birds observed at Bassin Ibis on 13/01/01
AC/JF/CE	Two birds observed at Bassin Ibis on 12/02/01
PB	17 birds observed at Bassin Ibis on 25/04/01
PB/TC/CS/GE	Two adult flamingos observed at Bassin Ibis on 22/08/01
CS/GE	5-6 birds were observed near Bassin Ibis on 20/09/01
MA/CS/AC/TM	One flamingo observed near Bassin Ibis on 20/10/01
GE	Two birds flying over Station towards lagoon on 15/12/01
MA	Six birds observed near Bassin Ibis on 17/12/01
	<b>Unidentified small dove</b>
RWW	Probably Namaqua dove but barred ground dove not ruled out. By Station mess on 02/04/01
	<b>Madagascar Pratincole</b> <i>Glariola ocularis</i>
AL/MA/TD/TM	One bird observed between Anse des Cocos and Anse Badamier on 07/11/01, 08/11/01, 20/11/01, 29/11/01 and 30/11/01
	<b>Cuckoo</b> <i>Cuculus sp.</i>
CS/MA/TM/JB/SP	Bird first sighted on 09/11/01 remained 8 days at the Station
AL/AC/GE	
	<b>Spotted Flycatcher</b> <i>Muscicapa striata</i>
AC	One bird sighted at the Station on 24/11/01

TM/MA/CS/GE      **Black-crowned Night Heron *Nycticorax nycticorax***  
One adult in breeding plumage observed at Bras Cinq  
Cases on 21/09/01

PB      **Masked Booby *Sula dactylatra***  
One bird observed at sea in the vicinity of Picard 08/08/01

**Observers:**

**FA**, Francis Alcindor (boatman/fieldworker); **MA**, Mervin Aglae (boatman/ranger); **PB**, Philip Baccus (boatman); **JB**, Jourdan Barra (cook/fieldworker); **BB**, Brian Betsy (ranger); **AC**, Allen Cedras (logistics manager); **TD**, Tina Dubel (ranger); **CE**, Cliff Emile (ranger); **JF**, Joseph Francois (visiting scientist/Ministry of Environment); **TG**, Tony Gonthier (fieldworker); **SB**, Stephen Boniface (ranger); **GE**, Guy Esparon (warden); **MH**, Mathew Harper (volunteer); **CH**, Camille Hoareau (ranger); **AL**, Anna Liljevik (research officer); **TM**, Terence Mahoune (ranger); **SP**, Simon Poupponneau (fieldworker); **GR**, Gerard Rocamora (visiting scientist); **CS**, Conrad Savy (volunteer); **AS**, Adrian Skerrett (SBRC & SIF committee member); **RWW**, Richard White (field assistant to R. Wanless); **RW**, Ross Wanless (visiting MSc student).

### **3 CONSERVATION AND MANAGEMENT**

#### **3.1 Waste and Beach cleanups**

The amount of non-biodegradable 'junk' that floats ashore onto the beaches of this world heritage site is astonishing. Worst is the South Coast, which is completely littered with flip-flops, buoys, and just about anything that floats in seawater. These objects have undoubtedly accumulated over many years. Apart from being a massive eyesore, the debris may cause harm to wildlife; including the turtles that come to nest on Aldabra's beaches. With a limited number of workers, however, it is difficult to resolve this problem – particularly along the remotely located beaches and where boat landings are difficult and risky. On the other hand there are places where staff can make a difference. The 'index beaches' along West Grande Terre and Settlement beach are easily accessed from the Station, and are also popular turtle nesting beaches. These can be cleaned regularly.

We started scheduling a monthly beach cleanup along Settlement beach by monitoring staff. A turtle track count could be done at the same time, since the cleanups were in the mornings. The Warden also scheduled monthly cleanups of the Station area as a collective effort by all Station employees.

Rangers were urged to bring back tins and glass following each field camp visit for disposal and shipment to Mahe, but a large amount of waste

(accumulated over many years) remains to be removed from the camps. The warden has been actively involved in attempts to remove this waste.

Fishing nets were sometimes found entangled onto the reef and removed by Station staff, sometimes by SCUBA. We also came across a drifting Fish Aggregating Device (FAD), which was brought back to the Station for disposal. There is a large amount of asbestos scattered around the Old Settlement area from old houses that have collapsed. This should be removed by persons with proper equipment and training in hazardous materials.

### **3.2 Trail clearing and marking**

Maintaining of the existing monitoring trails was a challenge to keep up with during the wet season with a rapid vegetation growth. Rangers and fieldworkers worked hard at this task. Additional paths (through Bras Monsieur Clairemont, and along the Southwest and Northeast coast of Grande Terre) were cleared by the warden and a team of fieldworkers. The GPS coordinates of these trails are kept with the warden.

In order to avoid confusion and to ensure that the correct beach number is consistently recorded during track counts, rangers labelled the turtle beaches along West and South Grande Terre with numbered wooden posts. This was done with new monitoring staff members in mind.

### **3.3 Giant Tortoise Poaching Incident**

In October 2000 we had an incident where it was discovered that 9 immature tortoises were being held in captivity by Station staff, and that three of those had gone missing at the time when two vessels were visiting Aldabra. SIF was notified regarding the missing tortoises and searches of the ships were carried out, but the tortoises were never recovered.

### **3.4 Introduced mammals**

#### **3.4.1 Feral goat *Capra hircus***

The following sightings of goats were reported following trips to Grande Terre August 2000 – January 2001 (Table 14.). The largest number of goats sighted at one location and during one single observation was a group of 40+ at Takamaka Hut in June 2001. Since August 2000, a total of 21 goats have been killed by Aldabra staff and warden.

Year	Month	Location	Abundance
2000	10	Cinq Cases Coast	6
	10	Cinq Cases Hut	13
	10	Takamaka Hut	1
2001	02	Cinq Cases Coast	4
	06	Takamaka Hut	40+
	06	Cinq Cases Groves	10
	06	Between Groves and Hut	10
	07	Cinq Cases Coco Transect	2
	08	Pointe Grande Terre	7
	08	Cinq Cases Coast	2
	09	Bassin Flamant	9

**Table 14.** Goat sightings reported from visits to Grande Terre, August 2000 – January 2001.

### 3.4.2 Feral Cat *Felis domestica*

Cat prints were observed regularly along the beaches of Grande Terre and a total of four cats sightings were reported August 2000 – January 2001. The cat observed at Dune Jean-Louis in August was shot and killed.

Year	Month	Location	Abundance
2000	10	Dune Jean-Louis beach	1
2001	06	West Grande Terre beaches	1
	08	Dune Jean-Louis beach	1
	12	Cinq Cases Hut	1

**Table 15.** Feral cat sightings reported from field camp visits, August 2000 – January 2001.

### 3.4.3 Ship rat *Rattus rattus*

No other species of rats were observed during the report period. All rats trapped at the Station were measured, weighed and sexed (section 2.3 this report).

In order to prevent the accidental introduction of other species of rats to Aldabra (e.g. *Rattus norvegicus*), all vessels calling on the atoll should be inspected prior to their departure from Mahe and carry rat bait stations which can be inspected by rangers immediately upon the ship's arrival in the event that stops have been made at other islands along the way to Aldabra.

During my appointment as RO, these issues were discussed together with the warden, rangers and visiting field assistant Richard White and it was felt that a quarantine area should be constructed near the beach through which supplies arriving on the atoll could be channelled and inspected for rats or any other

alien species. With the high workload of Station staff and other high-priority projects this one never materialised, but may be a topic of discussion for the Scientific Sub-committee and something worth looking into seriously in the future.

In order to prevent the risk of future introductions of alien species, large vessels should not be allowed to land directly onto Settlement beach.

### **3.5 Marine resources on Aldabra**

With two exceptions, that is to say the sea birds and the turtles, there appears to be a tendency to view Aldabra as a reserve, which primarily concerns the protection of terrestrial species. Undoubtedly, one of the key species on Aldabra, the tortoise, is terrestrial. However, it should be realised that terrestrial and marine ecosystems do not function independently. Everything is inter-related, and perhaps particularly so on Aldabra, being the atoll it is with its massive lagoon and being surrounded by seawater, which even penetrates through the *champignon* and into the terrestrial environment. Not to mention all the seabird populations dependent on marine species for food. Surely, finding the means of managing the aquatic and terrestrial system as a whole ought to be the most sensible approach.

The recent commercial harvesting of fish is one example of how the marine environment currently appears to be viewed separately from the atoll itself. This tendency also includes certain Station staff members (certain management staff not excluded) apparent lack of respect of the no-fishing zone along the reefs of Aldabra. Despite several 'reminders' it was apparent that subsistence fishing did occur much closer to shore than permitted, and even inside the marine transects at times (as witnessed while I was carrying out reef surveys together with visiting marine scientists). Persons responsible for scheduling fishing trips were provided with GPS coordinates of the permanent transect locations, and as there was more than one handheld GPS on the Station these areas could easily have been avoided.

It was felt that fishing further out at sea would not yield enough fish for Station needs. This is perhaps understandable, since alternate sources of protein are expensive and obtained in a limited supply only (via shipments from Mahé), while the fish caught locally are provided free of charge to all staff. Nevertheless, staff members' primary role on the atoll should be to help protect Aldabra's environment and, though Aldabra may seem to have a great abundance of reef fish today, it must be realised that this resource is not limitless and care must be taken to avoid its over-exploitation. Though requiring more effort in terms of time, fuel and expense, it may be preferable to encourage fishing trips further out at sea as the primary method of subsistence fishing, thus focusing more on pelagic species rather than Aldabra's reef fish which are territorial to and located within the protected zone of the atoll.

### **3.6 Oil Spills**

An oil spill in Aldabra waters would be detrimental to its flora and fauna and a contingency plan needs to be developed. There is currently no equipment on the atoll for containing a potential spill. If an oil spill were to reach the beaches or the lagoon and mangrove areas, the outcome would be truly disastrous.

### **3.7 Fire Hazards**

There is a gas cooker at all of the field camps and yet there are no fire extinguishers in place, apart from the Station. Kerosine lamps and candles are also used in the evenings, as there is no electricity. During the dry season in particular, a large fire could spread very easily and quickly and it should therefore be made a priority to equip all of the field huts with a fire extinguisher.

## **4 STAFF & ADMINISTRATION**

### **4.1 Staff**

There has been a very high turnover of monitoring staff on Aldabra during a relatively short period of time. This has made the monitoring-work less efficient than it could have been with a greater continuity of staff. Numbers of staff have been extremely irregular. At times there was not a single ranger on the atoll, while at other times there have been up to 5 new staff members requiring training in monitoring skills. This has required considerable time and effort from my part and where I have sometimes had to put certain RO duties on hold to carry out ranger duties myself or constantly train new staff members as they arrive. When there were no rangers on location I was forced to carry out the monitoring on my own or with other staff members without formal ranger skills, and sometimes even with the help of visitors without proper ranger training but kind enough to lend me a helping hand. Having new rangers spending only a few months on the atoll has taken more effort and time in terms of training, only to see them depart after a few months.

I do agree that the staff exchange programme and having volunteers on short-term contracts is a good idea. This allows for an exchange of knowledge and experience, which can be very beneficial for those involved. However, in order for things to run smoothly there needs to be at least one or two seasoned rangers with knowledge of Aldabra at all times. With a constant supply of new staff and no experienced staff on hand there are simply not enough resources to allow for a positive exchange of experiences.

I do hope that this trend will change towards more continuity. The group of rangers recruited towards the latter half of my contract were particularly positive and conscientious. Hopefully, they will opt to stay on for some time.

## **4.2 Request for Rangers Gear and First Aid Training**

### **4.2.3 Rangers Requests**

There is great room for improvement in terms of equipment offered by SIF when it comes to the type of equipment and gear issued to rangers. Probably the most urgent need is that for proper walking boots. The terrain on Aldabra is extremely rugged and sharp in many areas, and monitoring staff wear out their own personal shoes in no time at all. The “jelly-shoes”, which are provided by SIF, are next to useless and painful to walk in. The ones with metal buckles are particularly ineffective as they rust within a matter of weeks. To reach certain places one must sometimes walk through muddy mangrove areas inside the lagoon and - imagine - your feet sinking half a meter into the mud while the shoes remain stuck in the mud. This causes serious accidents to occur, as the champignon buried in the mud is sharp as a razor blade. Proper walking shoes could be issued on Mahe prior to the rangers’ departure, as keeping a stock of assorted sizes on Aldabra would not be practical.

Proper backpacks are also needed, as there are only two large enough for camps.

### **4.2.4 Monitoring Equipment**

Rangers accidentally lost two of the Station’s leatherman pocket-tools. These were used during camp visits and for straightening out problematic turtle tags. A few simple pliers will need to be obtained for the turtle tags, unless the funds are found to replace the two leatherman pocket-tools.

During a ‘Rangers Meeting’ the rangers expressed to me that they would like an official work uniform with an ID card and a badge with SIF logo. It was felt that this would be more appropriate than civilian clothes when carrying out certain duties such as those which involve contact with visitors and/or when carrying out patrols.

Ideally all staff on Aldabra should be trained in First Aid. Perhaps it would be most important for those who go to remotely located field camps where it may take half a day to return to the Station, depending on the state of the tide. Rangers and fieldworkers could be certified in First Aid prior to their departure from Mahe.

## **4.3 Monitoring equipment**

Some major monitoring equipment received included one Olympus digital camera, three sets of Viking binoculars, and three SCUBA wetsuits.

The SCUBA tanks and regulators were last serviced in August 2001. It was recently noted that one of the pressure gauges is faulty, indicating that there is 20 bars of air in the tank when it is in actuality empty. The warden was notified of the faulty gauge, as it should not be used. An inventory of SCUBA gear was also handed over to the warden, although this is expected to change

shortly with many additions. As I was leaving Aldabra, the Station was expecting a film crew, who have promised to donate a large amount of SCUBA gear (including a new compressor).

The GPS and hand-held computer were both in good working order and left in the research officer's office. The book *Terrestrial Ecology of Aldabra* by the Royal Geographical Society was handed over for safe-keeping by the warden.

#### **4.4 Scientific Workshop**

A scientific workshop was held on Aldabra 7-18 December 2000. Researchers from both Seychelles and overseas participated in the workshop. The researchers made numerous field observations within their domain of expertise, and made suggestions on how the running of the Station might be improved. An internal working report on various observations, conclusions and recommendations on future research projects was produced by the workshop participants. This report was forwarded via e-mail to Aldabra, but could not be downloaded as the large file caused the whole e-mail programme to freeze up and the mail had to be removed by our server in South Africa. A hard copy had been requested from SIF headquarters for the Station library.

#### **4.5 Communication of Proposed Research Projects**

It became very apparent that there was a serious lack of communication from SIF headquarters on upcoming research projects on the atoll. Proposals or research objectives were seldom received by Aldabra management prior to the arrival of researchers on the Station. This has caused a lot of unnecessary frustration and a feeling of exclusion from all science-related issues being discussed within SIF and the Scientific Committee. Whether it has actually been a lack of communication or perhaps the manner in which proposals are processed is not entirely clear. A certain degree of flexibility is obviously necessary at times, but there is probably still a need for improvement in this area.

#### **4.6 Library References**

A number of recent scientific publications and technical reports were obtained from various sources (Appendix V). Many of these were received by participants of the Scientific Workshop and AGM in December 2000. Several of the references are photocopies of scientific papers, some are in the form of pdf-files held on the Dell PC in the library block, while others are reports resulting from research work on Aldabra. One very appreciated contribution was the latest field guide *Birds of Seychelles*. This book has been of great use in the identification of vagrants on Aldabra. The new references were entered into a Filemaker Pro database on the library block computers, so that searches can be made on keyword, title, author, publication date etc.



#### **4.7 Computerisation of Monitoring Data**

All monitoring data collected were computerised onto the RO and Rangers computers in the library block, with copies forwarded to SIF headquarters. This work was carried out by research officer, rangers and volunteers. Since MSWorks is a bit outdated, we started using MS Excel for the computerisation of most of the monitoring data. Exceptions were the turtle data, which are entered into File Maker Pro, and the seawater temperature data, which are downloaded into Box Car Pro and then exported to textfiles. File names can be viewed in Appendix V.

## **ACKNOWLEDGMENTS**

I wish to extend my warmest thanks to all of those I have worked with on Aldabra. Everyone has contributed in one way or another to the running of the Station. I have particularly enjoyed working with the rangers (especially towards the latter half of my appointment when we had an excellent working team) and they should be commended for their strong interest and support in implementing the Aldabra monitoring programme. I am most grateful to SIF Chairman Mr. Maurice Loustau Lalanne, SIF Executive Director Mr. Lindsay Chong-Seng, SIF Local Committee and Scientific Sub-committee members for giving me the opportunity of working and spending two years of my life on this amazing atoll. I would also like to thank SIF Executive Officer Ms. Angela Valente, George August and support staff at SIF headquarters, Dr. Jeanne Mortimer for friendship and advice in turtle monitoring questions, Mr. David Rowat and IOE for logistical assistance (including the filling of SCUBA tanks) on Aldabra, all visiting scientists conducting research on the atoll, volunteers and many visitors, too numerous to mention here (including groups of teachers and schoolchildren), who have assisted in many ways and shared the Aldabra experience with us.

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