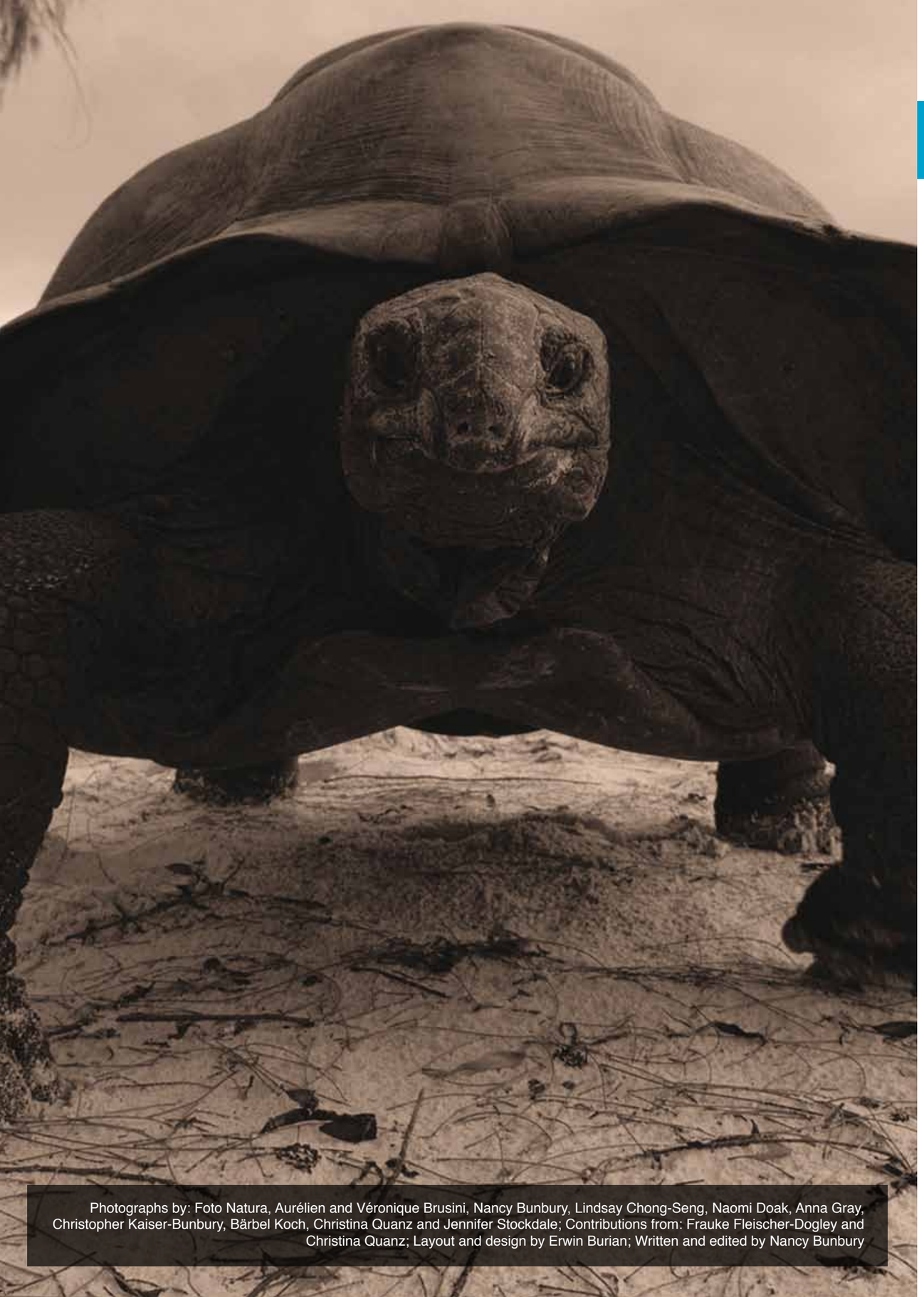
SIF ANNUAL REPORT

2009

Seychelles Islands Foundation



Photographs by: Foto Natura, Aurélien and Véronique Brusini, Nancy Bunbury, Lindsay Chong-Seng, Naomi Doak, Anna Gray, Christopher Kaiser-Bunbury, Bärbel Koch, Christina Quanz and Jennifer Stockdale; Contributions from: Frauke Fleischer-Dogley and Christina Quanz; Layout and design by Erwin Burian; Written and edited by Nancy Bunbury

CONTENT

MESSAGE FROM THE CEO

During and following the oil and global financial crisis of the last few years we were sure that we had faced all possible difficulties and threats to our Aldabra operation and that the management of the site could not become any more challenging. How little did we know…

Although pirates and sailing ships have always been part of Seychelles' history and stories are told about La Buse and his treasure, the issue of piracy lost its romance overnight when the Indian Ocean Explorer was taken hostage in the immediate vicinity of Assumption in March 2009. The hijacking happened immediately after the vessel had dropped off clients who had been exploring some of the outer islands including Aldabra. The hostages included colleagues, even friends. A consequence was that safety and security issues, which were already far from straightforward to resolve in the context of the outer islands, had to be immediately reviewed. The situation occurred shortly after SIF had successfully launched several collaborations with local yacht charters and tour operators in attempts to increase the financial sustainability of Aldabra and reduce the dependency of this site on the income generated by the Vallée de Mai. Aldabra's promising new source of income consequently vanished almost overnight.

As a result, the need to diversify the income generated in the Vallée de Mai and not depend solely on entrance fees became even more urgent. SIF launched new collaborations and, at the end of 2009, coinciding with the joint celebrations of SIF's 30-year anniversary and 25 years since the Vallée de Mai was inscribed on the UNESCO World Heritage list, a new visitor centre was opened by our Patron, President James A. Michel. Seychelles has its own brand and generally attracts visitors with higher incomes there was a need to provide high quality facilities which reflect the site's outstanding and unique values. The natural beauty and diversity of the Seychelles is the basis of the country's economy, a fact which the management of natural sites cannot overlook. Visitor satisfaction and expectations are not only linked to certain sectors so a substantial tourism survey was undertaken by us, the results of which have helped us to rethink and design the set up of our new visitor facilities.

In addition to its beauty and appeal the Vallée de Mai is finally finding its rightful place in science, and today, scientific research and monitoring is occurring not only on Aldabra but also in the Vallée. Finding out more about the mystical coco de mer is more than a lifelong mission and includes studying other sometimes less charismatic species which together form this unique forest ecosystem. These research results will guide us and ensure that informed management decisions are made to guarantee the protection of the place in the long-term.

Once more, 2009 presented us with a wide range of challenges in our two UNESCO World Heritage sites which could not be more different. Nevertheless the twinning and management inter-linkages have yet again provided us with opportunities to address and overcome these.

Dr Frauke Fleischer-Dogley

Major milestones & progress in 2009

2009 was a successful year for SIF in terms of securing new projects, making progress with research and achieving major milestones including:

- Opening of the new visitor centre at the Vallée de Mai (p4)
- The designation of Aldabra as a Ramsar Wetland Site of International Importance in November 2009 (p7)
- ReCoMaP project awarded to SIF to improve infrastructure and management of Aldabra (p16)
- Comprehensive survey on tourists' awareness and opinions of SIF and the Vallée de Mai (p3)
- Considerable progress with coco de mer research (p8)
- The discovery of a new population of *Sooglossus* frogs on Praslin (p11)
- UNESCO funding for a new boat for logistics and marine monitoring on Aldabra (p16)
- Two reptile MSc projects in the Vallée de Mai (p9)
- Mangroves for the Future educational books project awarded and launched (p16)
- CC DARE project awarded jointly to SIF and SeyMet to improve climate data collectio in Seychelles and help the country adapt to climate change (p17)
- Branding exercise & new logo for the Vallée de Mai

photo: A. & V. Brusini

Tourism survey report by Anna Gray

TOURISM SURVEY ASSESSES AWARENESS AND OPINIONS OF THE VALLÉE DE MAI

A tourism survey was conducted over a 3-week period in May 2009 by SIF volunteer Anna Gray at the international airport on Mahé. The survey aimed to better understand tourist actions and perspectives relating to three important issues for SIF: tourism and visitor satisfaction in the Vallée de Mai, coco de mer sales to tourists and general tourist awareness of SIF and its work. Knowledge of tourists' opinions on these issues is vital for SIF to identify potential problems and strive for continual improvement of visitor management and conservation education and awareness. The survey response was very successful, with over 850 individuals responding to the questionnaire over an intensive 3-week period. This response provided a substantial dataset from which conclusions and recommendations were drawn and partially implemented in the new set up.

Visitor awareness of the Vallée de Mai

More than 50% of respondents had visited the Vallée de Mai during their time on the Seychelles, which underlines the Vallée's status as the number one tourist attraction in the country. Generally the attitude among those having visited the site was very positive and the visit was seen as a highlight of the trip. A need for more clarification of the entrance fee was identified which this was largely due to lack of awareness of the fee's contribution towards the management of Aldabra. Some confusion was also expressed about guiding possibilities at the site. Both of these issues have already started to be addressed by SIF and progress is already being made with awareness raising.

Coco de mer sales

As expected, the survey also identified high tourist demand for the coco de mer nut and indicated a range of sources used by visitors to buy nuts.
SIF was a key source of nuts
but visitors also used other accredited sellers.

Awareness of SIF

General awareness of SIF and its work was found to be very low, as well as the link between the Vallée de Mai and Aldabra. This has implications for SIF's reputation and marketing strategies for the site. Tourists need to be made more aware of SIF as a tangible non-profit organisation committed to conservation and the challenges involved in managing the two sites. Measures to raise visitor awareness are already being implemented at the Vallée de Mai with posters and banners on display to show the link between the two sites, and the first Vallée de Mai logo being created and used.

Concluding comments

Overall, the survey successfully identified a number of issues requiring consideration by SIF and demonstrated the importance of seeking stakeholder feedback, both to guide and support planning and management as well as to assist in evaluating actions taken. Further, the survey was timely for providing information prior to the opening of the new visitor centre since the results could be incorporated into the design and planning of the centre. The feedback also provided baseline data against which improvements to the site can be measured and which can feed back into future management plans to ensure a positive and sustainable future for both sites, SIF and the coco de mer. SIF would like to extend our thanks to Anna for her thorough and extensive efforts on this survey and the follow-up analysis and reporting

The new Vallée de Mai Visitor Centre (photograph: C. Quanz)

SIF OPENS NEW VISITOR CENTRE AT THE VALLÉE DE MAI

SIF decided in 2006 to invest in the construction of a new visitor centre at the Vallée de Mai to improve visitors' experience, maximise the educational opportunities presented by the site and provide facilities worthy of its World Heritage status. Construction of the new visitor centre began in 2007 and was completed during 2009.

The visitor centre was officially opened on Saturday 19th December 2009 by the President of the Republic of Seychelles and Patron of the Seychelles Islands Foundation, James Michel. Two official plaques were unveiled by the President, one celebrating the inauguration of the building and marking the 30th anniversary of SIF as well as 25 years of the Vallée de Mai's World Heritage status, and the second commemorating the bravery of the fire-fighting team led by Mr Ephrem Poole who prevented a fire from destroying the Vallée de Mai in 1958.

The opening day itself was a great success thanks to the outstanding teamwork shown by the entire SIF team from Praslin and Mahé plus board and science committee members and even independent tour guides – all of whom contributed to ensure the occasion went smoothly. The event was celebrated with the recently established Friends of Vallée de Mai children's group who performed songs, poetry and a play around environmental and Vallée de Mai themes. The play in particular generated much amusement with its portrayal of well known Praslin and SIF characters outwitting a group of coco de mer poachers! Awards were presented to long-serving current and former staff and associates of SIF including former Director of Forestry Willy Andre, former Vallée de Mai Site Manager Aterville Cedras, long-term staff member Lindsay ChongSeng, Board member Victorin Laboudallon, long-term Vallée de Mai staff and former staff members Evadney Lafortune, Charles Lesperance, Wayner Anacoura and Irene Lesperance. In addition, Emilia Sarah and Agnes Finesse are thanked for their services to SIF and the Vallée de Mai. New Seychelles NGO 'TRASS' (Terrestrial Restoration Action Society of Seychelles) presented SIF with a generous donation of an alarm system which was gratefully received on behalf of SIF by Chairman Mr Maurice Loustau-Lalanne and will help to increase security in the Vallée de Mai.

We hope very much that the new centre, which includes a new ticket office, a souvenir shop, an education and exhibition area, and improved and expanded visitor facilities, will lead to greater awareness and enjoyment of the site by our visitors. In 2010 we plan more improvements with the opening of a cafeteria in the centre and the addition of more display material to educate visitors about the Vallée de Mai, Aldabra and the important link between these two World Heritage sites.

Children performing music and a play at the opening of the centre (photo: N. Bunbury)

Long-service awards being presented to (clockwise from top-left) Aterville Cedras, Evadney Lafortune, Lindsay ChongSeng and Victorin Laboudallon for their dedication to SIF (photos: N. Bunbury)

Main pictures by A. & V. Brusini (left) and C. Quanz (centre and right)

ANNUAL VISITOR AND COCO DE MER STATISTICS 2009

Vallée de Mai visitor figures

The visitor figures for the Vallée de Mai in 2009 were approximately 62,850 for the year, which is 40% of the total number of visitors to Seychelles (157,541). This is about 10% fewer visitors than in 2007 and 2008 but similar to earlier years (Figure 1). To some extent, this was expected, with the slight decrease in tourism to the Seychelles and the global economic problems during the last year but it may also have been influenced by the lack of visitor centre, which opened later than planned at the end of 2009.

The monthly breakdown in visitor numbers in the Vallée de Mai (Figure 2) shows typical peaks corresponding with the Easter period (March-April) and the northern hemisphere's summer holidays with the lowest visitor numbers recorded in June, which is consistent with previous years, and also October and December. 2865 Seychelles residents visited the Vallée during 2009 (including 338 children) which amounts to more than 3% of the Seychelles population, a figure we hope will increase in coming years.

Coco de mer nut sales

A total of 898 coco de mer nuts were collected by SIF in 2009, 275 of which came from the Fond Peper reserve, adjacent to the Vallée. This is the highest number of nuts collected from Fond Peper (an area approximately three times the size of the Vallée de Mai), and the highest proportion of total nuts (31%), since collecting started in this area (Figure 3).

Aldabra visitor figures

Aldabra too hosted visitors but only for the first 3 months of 2009 before the increasing piracy threat forced us to close Aldabra to tourism for the rest of the year for the safety of all concerned. During these first 3 months of the year, however, Aldabra was visited by a total of 775 people. Despite being open for only 3 months, this is the second highest annual visitor number in Aldabra's recent history, suggesting that 2009 would have been a financially healthy year for the atoll had it not been for the piracy.

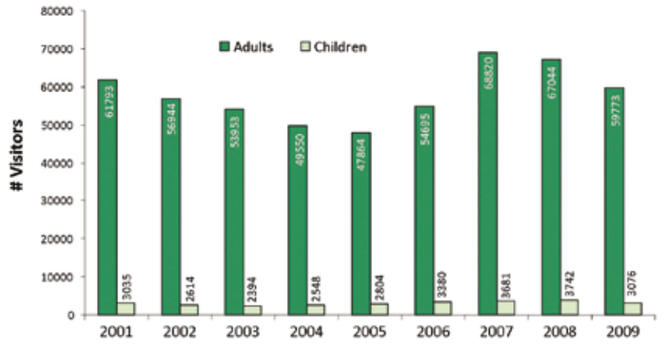


Figure 1: Annual number of adult and children visitors to the Vallée de Mai 2000–2009

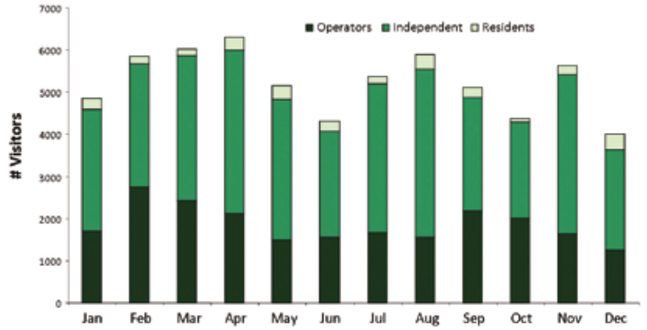


Figure 2: Breakdown of 2009 visitor numbers by month, showing number international (via operator or independent) and local visitors.

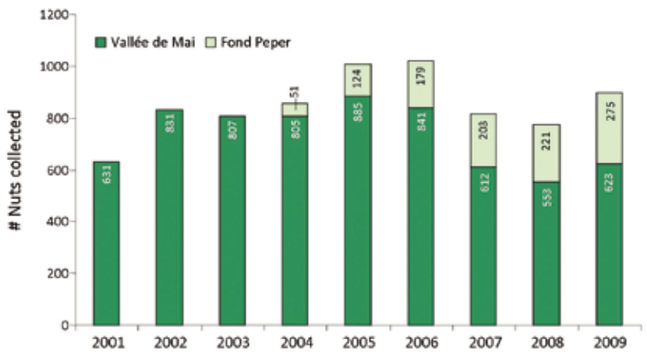


Figure 3: Number of coco de mer nuts collected annually from the Vallée de Mai and Fond Peper 2000–2009.

(photos: Foto Natura)

2009 MARKS ALDABRA'S DESIGNATION AS A RAMSAR SITE

Aldabra was recognised with another important designation in November 2009 when it was added to the Ramsar List of Wetland Sites of International Importance (Site No. 1887). With this designation, Aldabra becomes Seychelles' second Ramsar Wetland Site following the listing of the Port Launay Coastal Wetland in 2004. The official designation ceremony is planned for early 2010 when Aldabra and Mare aux Cochons, an upland freshwater site on Mahé, will be added to the Ramsar list.

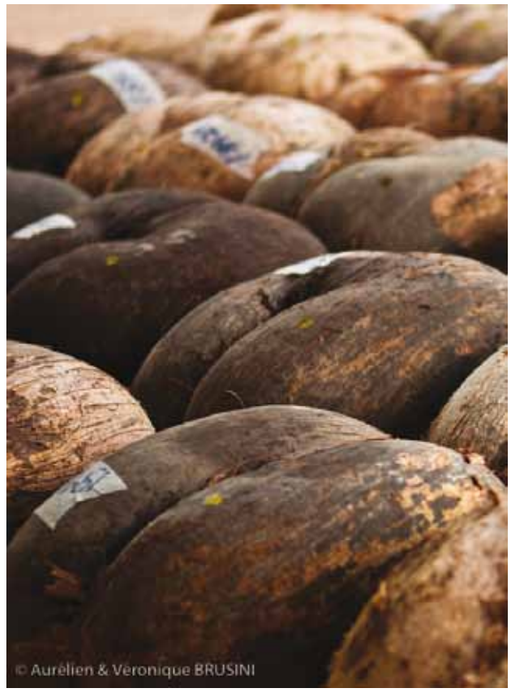
Wetlands are vitally important habitats, typically supporting many species and aquatic ecosystem services as well as providing stopping places for migratory birds. Wetlands are also under threat across the world and require urgent protection measures in many areas. The Ramsar Convention on Wetlands, endorsed and first signed in Ramsar, Iran in 1971, has grown to a global initiative of over 150 nations which acknowledge and promote the importance of wetlands and their conservation. Countries participating in the Convention agree to designate wetland regions as crucial ecological areas, pursue wetland conservation, encourage wetland research and cooperate with other countries to identify important sites.

Aldabra meets so many of the criteria for a Ramsar site it is surprising that its designation has taken so long. The atoll has large areas of a number of the wetland types recognised by the Convention, including mangrove swamps, seagrass beds, beaches, freshwater pools, lagoon channels and, of course, coral reefs. Aldabra also supports multiple globally threatened and endemic species and populations of terrestrial and marine plants and animals. Tens of thousands of waterbirds are supported across the different habitats, including about 5% of the global population of crab plovers, 3.5% of greater frigatebirds, 4% of lesser frigatebirds and around 10% of red-tailed and white-tailed tropicbirds. This information, as well as data on several other criteria, were thoroughly researched and compiled by SIF staff for Aldabra's Ramsar application. SIF is delighted with the outcome and we remain honoured to be the custodians of this outstanding and increasingly globally recognised atoll.

RESEARCH

PROGRESS IN THE VALLEE DE MAI

Research in the Vallée de Mai has often been overshadowed due to the success and popularity of science on Aldabra. The palm forest of the Vallée, however, is an equally unique and important ecosystem with considerable research potential. SIF's research work in the Vallée has therefore moved up a gear in 2009 and we are in the process of establishing a programme of ongoing and evolving research. This includes a number of exciting projects and developments in a range of areas with several collaborators. In 2009 there have been discoveries of new populations, studies of little known species, research into ecological interactions and work on sustainable use of resources. Many of these projects are ongoing and will involve continued monitoring and writing up of research results for publication in the near future. We are delighted to be building a base of strong collaborators keen to advance science at (and using) the Vallée de Mai.



ENFORCEMENT AND CAUTION REQUIRED TO ENSURE A SUSTAINABLE FUTURE FOR THE COCO DE MER

In Seychelles, the coco de mer is harvested for its gigantic seeds almost everywhere it grows - both legally and sadly also illegally. Since we have very little understanding of the coco de mer's lifespan, growth and reproductive capacity, the impact of harvesting on the future of this iconic species is not known. As one of the main legal harvesters of coco de mer nuts and as protector and managing authority of the Vallée de Mai, SIF is responsible for ensuring a viable future for this species and in 2009 launched a project to: (1) determine whether current harvesting rates are sustainable; and (2) guide future management.

In March–April 2009, SIF hosted Dr Lucy Rist, a post-doctoral researcher from the ETH Zurich who specialises in sustainable use of non-timber forest products. The project was supported by the Rufford Foundation (UK) and aimed to use existing data and new ecological field research to determine appropriate sustainable harvesting practices and launch a long-term monitoring programme of growth for the coco de mer. The work was guided by and conducted within the framework of the Coco de mer Working Group, led by SIF and Dr Christopher Kaiser-Bunbury and partnered by all major managing authorities of Coco de mer populations such as Department of Environment, Praslin Development Fund, and the Seychelles National Parks Authority. The working group was formed in 2009 to coordinate collaborative activities related to research and conservation of the Coco de Mer.

The project used a range of previously collected data by Dr Frauke Fleischer-Dogley to develop a basic population model for the coco de mer, incorporating information on recruitment, reproductive rate, mortality and estimated lifespan. The model provided an initial assessment of population status under the current harvesting regime and indicated that under current collection levels, the coco de mer population in the Vallée de Mai is in decline.

The modelling process and results led to the identification of priorities for long-term coco de mer monitoring in order to be able to move towards a more sophisticated model in the future. These priorities have already been integrated into the work plans for 2009/2010 together with the need to list the coco de mer kernel under Appendix III of CITES.

The work highlighted nut kernels as a potential additional revenue stream for SIF and identified illegal poaching as a serious threat to the coco de mer population emphasising the importance of enforcement and legislation as well as improving public awareness of the issue. Dissemination of project objectives and results has been conducted at several levels, including presentations on Mahé and Praslin which were attended by the press and members of the public, coverage in the Seychelles Nation and a TV news slot, and finally the submission of a paper for publication in a scientific journal. The paper is expected to be published in 2010.

TWO MSC PROJECTS ON ENDEMIC GECKOS IN THE VALLÉE DE MAI

The Praslin palm forest, including the Vallée de Mai, is home to a remarkable diversity of reptiles and amphibians for its small size. Over 15 species of gecko, skink, snake, chameleon, frog and caecilian which are endemic to either Seychelles or Praslin occur here, so the habitat is key zone for herpetofauna diversity and conservation. Little research, however, has been conducted to study the ecology of many of these species and possible reasons and mechanisms to account for this high diversity. Much more research is required to assess populations and identify suitable conservation strategies.

From March to June 2009, two MSc students from the University of East Anglia (UK;), conducted field work in the Vallée de Mai on two reptile groups. Both students researched niche partitioning and mechanisms of co-existence among geckos: Tammy Noble focussed on the two species of green day gecko (*Phelsuma*) and Verity Roberts investigated the bronze gecko (*Ailuronyx*) species. The aim of these projects was to investigate how such similar species are able to co-exist in the native palm forest of the Vallée de Mai.

Two *Phelsuma* day gecko species, *P. astriata* and *P. sundbergi* occur in the palm forest, which are apparently similar in appearance, diet and habits. Tammy found, however, that the two species segregate their niches according to the available resources. In terms of habitat preferences, the larger of the two species, *P. sundbergi*, showed a clear preference for coco de mer dominated habitat and were most often found on male coco de mer trees, suggesting that this gecko species is utilising the pollen resources of the palm. In contrast, *P. astriata* was found in more diverse habitat and showed no strong relationship with a particular species.

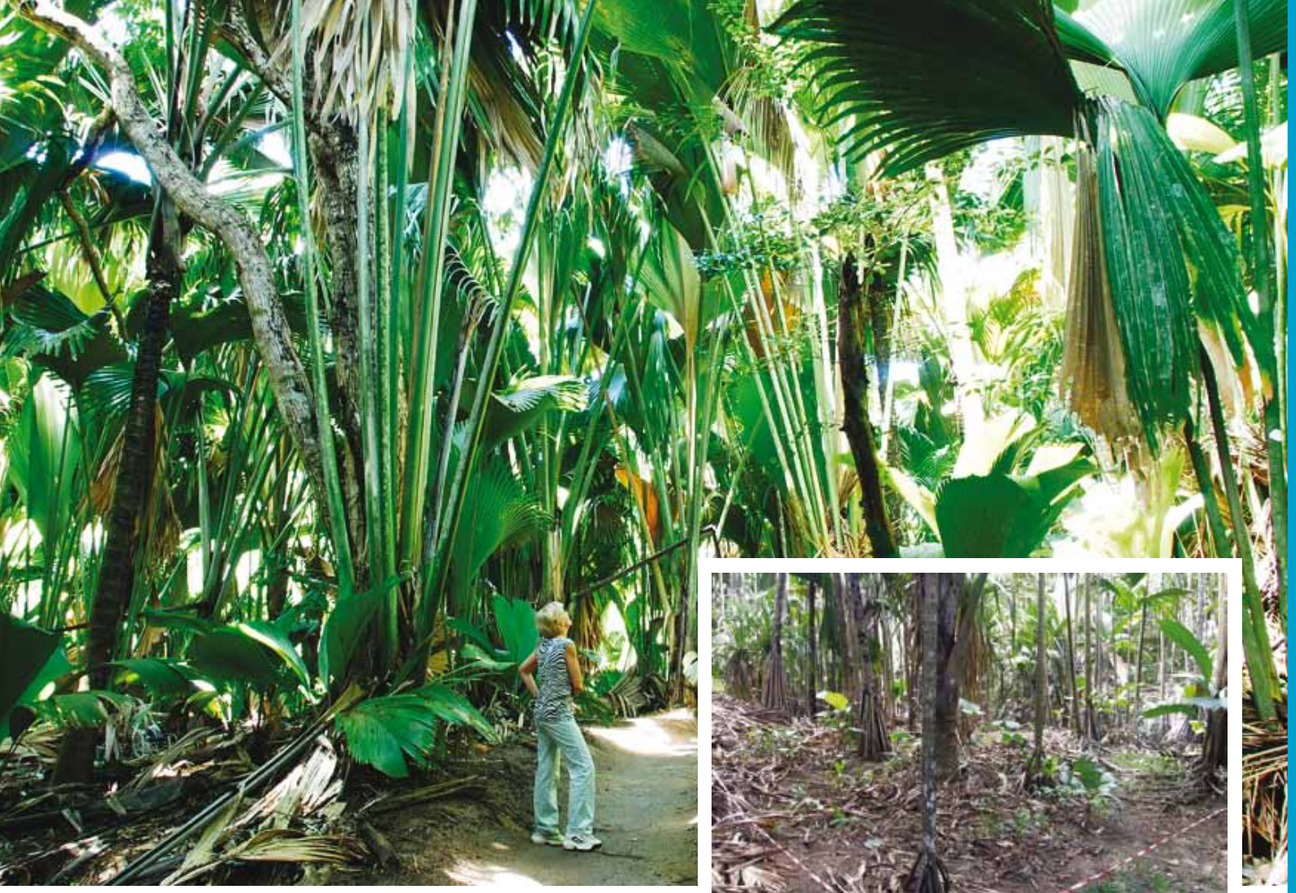
Verity conducted a similar study on the *Ailuronyx* bronze geckos, of which there are three endemic species in Seychelles, the rare giant bronze gecko *A. trachygaster*, the medium-sized bronze-eyed gecko *A. seychellensis* and the dwarf bronze gecko *A. tachyscopeaus*. All three species co-exist only in the palm forest of two Seychelles islands, Praslin and Silhouette and this research provided a rare opportunity to investigate the dynamics between these species when co-occurring. All three species were most commonly found on coco de mer palms but each preferred a different height of the tree, according to their size, with the largest gecko being found higher than the medium and dwarf geckos. In fact, like the larger *Phelsuma* species, the giant bronze gecko appears to dominate the coco de mer pollen resource.

Both students presented well-received final public talks about their results before leaving Seychelles. A publication from at least one of these research projects is planned for 2010. Ultimately, through this type of study, we hope to understand why reptile diversity is so high in the palm forest and the best strategies for maintaining this diversity.

Bronze gecko (*Ailuronyx*) species in the Vallée de Mai; the dwarf bronze *A. tachyscopeaus* (top), bronze-eyed gecko *A. seychellensis* (middle) and the rare giant bronze *A. trachygaster* (bottom) (photos: N. Bunbury and L. Chongseng)

Phelsuma gecko species in the Vallée de Mai; the larger *P. sundbergi* on a coco de mer inflorescence on the left and the smaller *P. astriata* on the right (photos: C. Kaiser-Bunbury)

From left to right: MSc students Tammy Noble (left) and Verity Roberts (right, with SIF team; photos: B. Koch)



LONG-TERM MONITORING PLOTS RE-SURVEYED FOR FIRST TIME SINCE 1998

Six plots were established in the Vallée de Mai in 1985 by a research group from Oxford University (known thereafter as the 'Oxford plots') to describe the plant community of the Seychelles endemic palm forest. The long-term aim of the Oxford plot study was to assess changes in palm forest vegetation by monitoring at regular intervals. The plots were re-surveyed in 1998 by a group from ETH Zurich led by Dr Karl Fleischmann. These first results revealed little change in forest structure, species diversity and regeneration, but indicated a relatively high species turnover over the 13-year period.

In 2009, almost 25 years after they were established, SIF volunteer Bärbel Koch together with Vallée de Mai staff and supervised by Dr Christopher Kaiser-Bunbury (ETH Zurich/Coco de mer Working Group), re-surveyed the Oxford plots and analysed and summarised the results in a detailed report. The data gathered in 2009 was a great improvement on previously collected data as it included all life stages (adults, saplings and seedlings) and identified all plants to species level.

The 2009 results showed that palms are becoming increasingly dominant in the plots while native broadleaf species are declining. High numbers of seedlings of introduced species were found but there appears to be minimal adult recruitment of these species so overall diversity of invasive plants has also declined.

The team also marked the four corners of all six plots with permanent posts, and made important advances in the way the plots are monitored. By GPS mapping and providing a visual reference for every individual tree, the plots were surveyed more accurately than previously and the resulting digitised maps will provide an important reference point for future surveys.

Very long-term monitoring studies of vegetation are relatively unusual due to the difficulties of following up and maintaining consistency. The Oxford plots study in the Vallée de Mai may be the only such monitoring to examine the long-term dynamics of palm forest, a habitat type which is increasingly rare globally. The research is therefore important for advancing understanding of vegetation changes in palm forest ecosystems under the current management scheme. The study is notable not only for its length but also for its consistency across three different research groups over 25 years. Efforts to publish the results of this study will be made in 2010.

DISCOVERY OF SOOGLOSSUS FROG IN THE VALLÉE DE MAI

With many frog species worldwide facing an uncertain future, SIF was delighted to be able to provide some positive news with the discovery of a new *Sooglossus* frog population on Praslin. In August 2009, SIF employee Daniel Jessy found the first *Sooglossus* frog that has ever been recorded on Praslin.

The Sooglossid family of frogs are represented in Seychelles by four described species which are endemic and were previously known to occur only on the two highest granitic islands, Mahé and Silhouette. The discovery of a population on Praslin is tremendously exciting as it represents either a significant range expansion of an existing Sooglossus species or, potentially, an undescribed species.

The Sooglossid frogs are amongst the smallest and most primitive frogs in the world, with several unusual features, including a high degree of parental care of young and a lack of eardrums. All are very cryptic in their behaviour but each species has a distinctive call which is often mistaken for insects or in the case of the Praslin frog, snakes!

The new population most closely resembles *Sooglossus sechellensis* from Mahé but certain differences have already been recorded. Research is now required to shed light on the population's origin by comparing their genetic variation and morphology with frogs on Mahé to determine if the population has existed on Praslin for a long time or has recently spread from another island. It is curious that nobody has ever recorded the frog before on this populated and popular island, and the planned research will also estimate population size and study the frogs' distribution and habitat preferences on Praslin. SIF is now working with ecologists and geneticists to conduct this research which will go ahead in 2010.

Whatever the population's origin, this discovery underlines the need for continued research and conservation in Seychelles, and the important role that the SIF plays in managing and protecting the Vallée de Mai.

OTHER RESEARCH IN THE VALLEÉ DE MAI

• In addition to the coco de mer work on harvesting sustainability, monitoring of leaf growth and reproduction continued and samples were collected for genetic research to be completed in 2010.

• A long-term black parrot monitoring programme was launched in October 2009 coordinated by Dr Nancy Bunbury and led in the field by French ornithologist and researcher, Dr Pascal Villard. The programme is still in early stages and will be described in more detail in the next annual report.

• SIF staff attended and contributed to the Black Parrot Action Plan workshop and resulting Action Plan 2009–2013

• Dr Chris Raxworthy, Associate Curator of Herpetology at the American Museum of Natural History, visited during December 2009 and gave an excellent series of presentations on Mahé and Praslin as well as a reptile workshop on Praslin, all of which were open to the public in addition to staff.

• Bärbel Koch, Anna Gray and Marc Jean-Baptiste conducted a preliminary study on the chameleons of the Vallée de Mai palm forest with some interesting results. Their study in July/August revealed that chameleons are more common than was previously thought in the Vallée de Mai. They also collected important biological data on the species and produced abundance estimates which have expanded the knowledge of this little known species. The study is currently being written up by the team for publication.

SIF volunteers Bärbel Koch and Anna Gray, Dr Chris Raxworthy (above) and Site Manager Marc Jean-Baptiste with chameleons in the Vallée de Mai (Photos: B. Koch and A. Gray)

RESEARCH & MONITORING ON ALDABRA

Summary of 2009 activities

The continuity of a single Research Officer, Dr Naomi Doak, on Aldabra throughout 2009 provided greater stability within the research department than in 2008 and enabled additional analysis and updates to the monitoring to be conducted. Standard monitoring programmes on climate, turtle tracks and tagging, giant tortoises, landbirds, wader counts, coconut crabs, subsistence fishing data and butterflyfish presence and abundance were continued. The tropicbird nesting and phenology programmes were revised and improved and opportunistic data were collected on dugongs and cetaceans. In addition to the routine climate monitoring, work began on compiling and checking of all climate records collected on the atoll since the 1950s which will be continued and completed in 2010 as part of the CC DARE project (p17).

Turtle monitoring

Turtle track counts for 2009 were even more complete than those from 2008 with counts for green turtles *Chelonia mydas* conducted every day except one (364 counts compared to 353 in 2008) on Settlement Beach in 2009. This is again the most complete set of annual daily track counts since the start of the turtle monitoring. Over 3400 tracks were counted on Settlement Beach alone with another 950 tracks counted on beaches around the rest of the atoll. Although green turtles nest year-round on Aldabra, emergence data over several years indicates that the nesting season timing is dynamic, with the peak in nesting activity varying slightly from year to year but usually occurring between March and June. In 2009 the peak was in March. A total of 72 green turtles were newly tagged during 2009 (46 nesting, 26 in-water) with another 12 having their tags replaced, and 13 hawksbills were newly tagged.

All Aldabra turtle data continue to be provided to Dr Jeanne Mortimer who, throughout 2009, has been analysing and preparing the long-term turtle dataset for publication. Early findings of this research indicate a significant increase in nesting population size of green turtles and SIF look forward to having the data from this important monitoring programme published.

A final note on 2009 Aldabra turtle activity was the first record of a hawksbill turtle which was tagged on Aldabra as a juvenile and this year recorded nesting on Desroches Island. Verifying identity of such turtles can be fraught with problems but the Desroches team had the presence of mind to photograph the tag of this turtle so its identity could be later checked and confirmed. This is an excellent example of the use of digital photography for identifying individuals in long-term monitoring programmes across different localities.

Research Officer Naomi Doak measuring a nesting green turtle (photo: N. Bunbury)

(photo: Foto Natura)

Crab plovers on Aldabra (photo: Foto Natura)

Red-tailed tropicbird adult and chick (photo: N. Bunbury)

Madagascar pond-heron in non-breeding plumage on Aldabra (photo: J. Stockdale)

Bird monitoring

Land birds continued to be monitored monthly using a point count system across the atoll. Sunbirds and small passerines remained the most numerous species. Bimonthly wading bird counts were continued on Settlement Beach and West Grand Terre in which 24 species were noted (excluding Madagascar pond-herons and flamingos which were both observed outside the couts), with the most common species being dimorphic egrets *Egretta dimorpha*, ruddy turnstones *Arenaria interpres* and crab plovers *Dromas ardeola*. Crab plovers are an unusual species and are unique among waders in digging their own nesting burrows. Although the species does not breed on Aldabra, the recent publication on Aldabra's crab plovers (Pistorius & Taylor 2008) indicated that up to 3800 crab plovers over-winter on Aldabra which amounts to approximately 5% of the global population and underlines Aldabra's significance as one of the Indian Ocean's key sites for wading birds.

The tropicbird nesting monitoring programme was revised in 2009 by Naomi Doak and Nancy Bunbury. All islets off La Gigi which can be reached at low tide and which have breeding tropicbirds (14 islets) are included in this monitoring and all nests are monitored and new nests searched for every 2 weeks. In 2009 a total of 53 red-tailed tropicbird *Phaethon rubricauda* and 19 white-tailed *P, lepturus* were found of which only 25 and 15, respectively, failed at egg stage, one and one, failed at chick stage, two and one fledged and the remaining nests were ongoing at the end of 2009. The high percentage of nests failing at egg stage (47.2% for *P. rubricauda*, 78.9% for *P. lepturus*) is a concern and likely due to the presence of rats on the islets. These islets were previously thought to be free of rats but evidence of their presence has been noted on several of them. Data covering more than one year are needed to confirm that 2009 was not an anomalous season in terms of tropicbird reproductive success so this monitoring will continue into 2010 before any management decisions are taken.

The Madagascar pond-heron *Ardeola idae*, among the most endangered species occurring on Aldabra, was monitored throughout 2009 starting with a volunteer project by Jennifer Stockdale. The species proved difficult to locate and monitor as it mainly occurs in the less visited east of the atoll, where it is thought to breed (only visited monthly or bi-monthly) and is very flighty. The objective of this monitoring programme is to determine more accurately where and when this species occurs on Aldabra and provide a better idea of its breeding habits. All previous documented information on the species was compiled and eight targeted surveys based on this information were carried out on boat and foot during Jennifer's project time. All sightings were recorded with details on group size, breeding plumage, location and behaviour. During the project, 59 pond-heron sightings were recorded in eight different areas (including repeat sightings) mostly in the east of the atoll. Following Jen's departure, the monitoring was continued and observations of at least one pond-heron occurred on a further 32 occasions, which were mostly single or pairs of birds with the largest group was four individuals. Only two observations of birds in breeding plumage were made during 2009 and no nests were found despite intensive searches. All of the research team were trained in identification and survey techniques and a map of sightings has been compiled. Due to the difficulties of monitoring this species the project has been extended into a longer term data collection programme which will continue to detail all sightings with a more intensive project planned once more data are gathered. SIF is part of the regional Madagascar pond-heron network and, ultimately, we hope that by continuing to build the knowledge base of the pond-heron on Aldabra we can help to improve the current conservation status of this species.

SIF rangers Alex Underwood and David Boodna conducting the phenology monitoring (photo: N. Bunbury)

Solanum indicum ('Anjuive') is endemic to Aldabra and part of the phenology monitoring programme (photo: L. Chongseng)

Phenology programme improvements

The 2-weekly phenology survey on Aldabra provides critical information on plant fruiting and flowering which is an essential baseline for ecosystem and other species research. In early 2009, pollination ecologist Dr Christopher Kaiser-Bunbury visited Aldabra and helped SIF to review the existing phenology monitoring methods which had been deemed too complex and subjective. The revisions simplified the way the data are collected making it more objective while improving its robustness for later statistical analysis by increasing the number of individuals. Christopher provided many other pointers and developed and tested a full protocol for the new programme which has been implemented for the remainder of 2009.

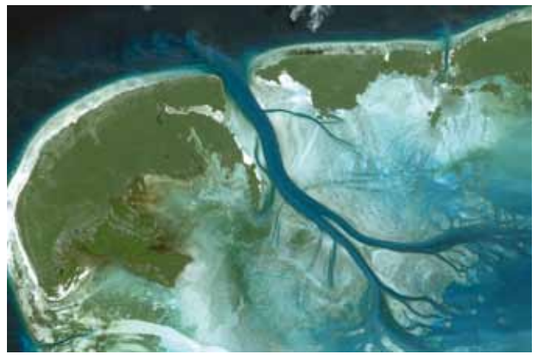
The monitoring programme is an effective way to train the rangers on Aldabra in plant identification and phenology monitoring skills and additionally will produce high quality data which can be used to answer ecological questions at the community level (e.g. pollination network and seed dispersal research) as well as more specific biological questions at the species level.

REMOTE SENSING OF LAGOON AND TERRESTRIAL AREAS OF ALDABRA

Fieldwork for the collaborative project with the Cambridge Coastal Research Unit (CCRU) and the GIS Unit of the Department of Environment, to apply satellite remote sensing techniques to Aldabra's terrestrial and lagoon areas and produce high resolution maps of the atoll got underway in early 2009.

Ground-truthing fieldwork for the project was completed in January-March 2009. High resolution Quickbird satellite imagery was used as the basis of the mapping and two teams worked on the marine (lagoon) and terrestrial aspects of the work. The lagoon fieldwork, led by Sarah Hamylton and Dr Annelise Hagan of CCRU, included coral assessment using video transects, recording of lagoon floor habitats, GPS surveys of benchmarks and tidal measurements. The terrestrial work, led by Justin Prosper of DOE and SIF's Lindsay ChongSeng, involved extensive vegetation surveys across the atoll for mapping and analysis. In late 2009 the project moved into the next phase of atmospheric correction, mosaicing of the image, removal of clouds and image classification. This phase is ongoing into 2010 and expected to be completedin 2011.

The research will provide high resolution habitat classification maps of the entire atoll, of which the lagoon area has never previously been mapped. The resulting baseline information and habitat data provided by the project will not only provide valuable current habitat and mapping information but will enable comparisons with former and future mapping exercises to assess critical issues such as climate change, invasive species effects and coastal erosion, all of which are likely to have serious effects on Aldabra. The project has been generously supported by the Environment Trust Fund of Seychelles.



OTHER ALDABRA RESEARCH IN 2009

• SIF was approached by Taiwanese researcher Dr Allen Chen who is leading a collaborative project on coconut crab *Birgus latro* genetics across the Indian and Pacific Oceans. SIF staff on Aldabra started collecting samples for this project and will complete sampling and send these in 2010.

• The first three years of the coconut crab monitoring data are being prepared for publication by former Research Officer Dr Pierre Pistorius.

• There were four dugong sightings in 2009 and all sightings in the last decade are being compiled in a publication which will include plotting the sightings on the new remote-sensing habitat map of lagoon.

• Dr Dennis Hansen from Stanford University visited SIF on Mahé in May. Dr Hansen is an island ecologist with particular interests in pollination and seed dispersal ecology and the use of megafauna re-wilding including giant tortoises in conservation programmes. He gave a public talk on how Aldabra giant tortoises are used as re-wilding tools in restoration projects in the Mascarenes and initiated discussions on plans for tortoise research on Aldabra.

• A paper was published on subsistence fishing data from Aldabra by former RO Dr Pierre Pistorius. The paper shows a declining catch per unit effort in fishing over time and postulates that this is due not to fishing pressure, which was very low throughout the study period, but to a general decline in fish abundance following the 1998 bleaching event (see p19 for publication details).

• An ongoing taxonomic debate about the scientific name of the Aldabra giant tortoise has prompted many contributions both locally and internationally. The details of Dr Jack Frazier's petition to stabilise the name *Testudo gigantea* (currently *Geochelone* [*Aldabrachelys*] *gigantea*) and subsequent comments can be referred to in all 2009 issues of the Bulletin of Zoological Nomenclature.

• Two articles about Aldabra appeared in the Nation and an article on Aldabra's Caspian terns by RO Dr Naomi Doak was published in the November issue of the Seychelles Seabird Group's Seabird News.

(photo: Foto Natura)

SIF ALDABRA PROJECTS

SIF applies an integrated approach towards marine conservation and research on Aldabra incorporating policy, technology, capacity building, science and education. Externally funded projects and internal support from SIF contribute to ensuring our objectives are achieved. In this capacity, SIF secured external funding for a number of important projects focussing on Aldabra in 2009. Projects funded by ReCoMaP, UNESCO, COI and CC DARE will improve SIF's management of the atoll through infrastructure development, installation of technological tools and staff capacity building and training. A project supported with funding from both MFF and ReCoMaP aims to improve children's education of Aldabra. SIF are very grateful to all five funders for their support of these projects, which together are raising management standards and awareness of the atoll.

ReCoMaP fund MPA management project

SIF secured a project from the Regional Programme for the Sustainable Management of the Coastal Zones of the Countries of the Indian Ocean (ReCoMaP) in April 2009 under the Marine Protected Area Call for Proposals. The project, "Ensuring the universal value of an MPA and World Heritage Site: Strengthening management, infrastructure, training and research on Aldabra Atoll" aims to maximise the potential of Aldabra as an outstanding example of an MPA and a global environmental benchmark. Activities under this project are already well underway and include renovating the field camp accommodation on the atoll, upgrading marine monitoring facilities, training of SIF staff in diving, maritime and GIS techniques and installing technology to improve basic monitoring standards. The project will contribute towards a new VHF communication system, tidal gauges (Aldabra currently depends on the Mayotte tide-table), an automatic weather station and more GPS units for more accurate data collection on almost every research programme. The project will lead to improved research facilities and infrastructure for SIF staff and researchers, better qualified staff, new databases in key areas such as tidal information, climate and GIS mapping, and improved management and safety.

UNESCO support marine surveillance and monitoring

UNESCO supported SIF in 2009 with a grant for a project called "Enhancing marine biodiversity monitoring, surveillance and conservation on Aldabra Atoll". Under this project, SIF was able to custom design and purchase a vessel for surveillance and monitoring on Aldabra. The new vessel, Al-Khadra, was designed locally, has been purchased and transported to Aldabra and is in action for marine monitoring and patrolling. Al-Khadra's presence has also improved safety conditions for staff on the atoll since boat transfers for medical reasons are now faster and safer than was previously possible. The purchase of Al-Khadra complements the objectives under the ReCoMaP project to improve management and infrastructure.

Mangroves for the Future Educational Project

Mangroves for the Future (MFF) are supporting a long-planned SIF project called "Development and production of two children's educational activity books including a science toolkit about UNESCO World Heritage Site Aldabra Atoll". This project was developed with and is being carried out by local environmental educator and biologist Katy Beaver and a group of local educators making up the Aldabra Children's Book Group. The overall aim of the project is to raise awareness and improve education about Aldabra and coastal ecosystem management at several levels, including developing educational material and printing two educational activity books about Aldabra for Seychellois children, one aimed at primary and the other at secondary level.

Al-Khadra on the water at Aldabra (photo: N. Bunbury)

Winners of the annual Eco-School competition visit to Aldabra in 2009 work and enjoy the atoll (photos: J. Larue)

Specific objectives include: (1) developing a science activity toolkit for use by children visiting Aldabra with the annual Eco-school visit, which will help them to appreciate the ecosystem and life on the atoll for SIF staff; (2) producing the two schoolchildren's books to educate children who do not have the opportunity to visit Aldabra themselves; and (3) raising awareness of Aldabra amongst visitors to the Vallée de Mai to inform more people of the important management and financial link between the Seychelles' World Heritage Sites and to make Aldabra more accessible through information displays. In addition to the short-term benefits of raised awareness of children and visitors, we hope that this project will, in the long-term, further increase appreciation and knowledge of Aldabra, and stimulate greater interest in working to manage and preserve the site.

CC DARE Adapting for Climate Change

The Climate Change and Development – Adapting by Reducing Vulnerability (CC DARE) initiative is a joint UNEP/UNDP Programme for Sub-Saharan Africa funded by the Danish Ministry of Foreign Affairs. In 2009, the programme awarded funding for a joint Seychelles National Meteorological Service–SIF project called: "Adaptation by increasing climate monitoring and climate change assessment in the Seychelles". The project will improve climate data collection in Seychelles, including on Aldabra, and assist the country in making the necessary adaptations to climate change. Activities under the project will start in 2010.

Towards sustainable operation of the Aldabra Research Station

As part of the Indian Ocean Commission (COI) project awarded to SIF in 2008, a detailed energy audit (started at the end of 2008) was completed in 2009 by MSc student Christina Quanz. All results were compiled in her thesis, which was submitted in September 2009. In addition to the energy audit, energy efficiency was evaluated and all potential renewable energy sources were discussed in the thesis and their feasibility on Aldabra assessed. Water and waste issues and general concerns in the logistic and boat departments were also included. Following thesis submission, all results were presented to the SIF board and approval was received to begin designing a hybrid photovoltaic/diesel system. In addition, it was decided that a study of wind measurements will be undertaken to assess the feasibility of operating a vertical wind turbine on Aldabra since, to date, wind power is the most effective way to produce electricity using renewable sources. In the meantime, four large fuel tanks have been purchased to ensure safe storage of fuel needed for boats and the diesel generator when in use.

In addition a new SIF policy was drawn up and implemented which aims to increase energy efficiency, avoid electricity wastage and generally increase SIF staff awareness of how they can minimise their environmental impact and that of the organisation. In 2010, a consultant will start working with SIF for detailed planning of the system, to contact suppliers and to prepare the groundwork required for the installation of the system.

GOAT ERADICATION PROJECT UPDATE

The final monitoring phase of the GEP continued throughout 2009, with the team making a monthly visit to track the Judas goats and try to locate associated animals. As expected, the batteries in the radio collars of the six Judas goats began to fail in about July 2009 and the others followed in rapid succession. By October only one battery was still functioning. This was a critical situation as SIF could not afford to lose our only means of reliably tracking all of the goats. In a race against time before the last collar battery failed, great efforts were put into intensifying the programme in the latter part of the year. Wildlife tracker and experienced hunter Tom Smith from Canada was recruited at very short notice and spent 6 weeks on the atoll in November/December aiming to dart as many of the original Judas goats as possible to fit new collars. With only one functioning collar, progress was slow but, much to the relief of everyone following the situation, one of the goats was successfully darted and re-collared in early December and can now be tracked for at least another two years. All six Judas goats were alive at the end of 2009 and more effort will need to be put into re-collaring the five remaining Judas goats in 2010 since a single functioning collar is still a precarious situation for the programme.

Due to the intensified field work, 2009 saw a doubling of effort (measured in field days) compared to 2008, but only two associate goats were shot (compared to 17 in 2008) indicating a considerable reduction in goat density. All sightings from 2008–2009 have also been mapped by the team which provides a useful overview of the target areas. There are still a minimum of two non-Judas goats which are unaccounted for. Tom provided intensive on-the-job training in darting and tracking to several SIF rangers and the priority for the first part of 2010 following Tom's departure will be to continue the re-collaring efforts with the SIF team.

Goat eradication project consultant Tom Smith on Aldabra in December 2010

FINANCIAL INFORMATION 2009

SIF's income continues to be dominated by Vallée de Mai entrance fees, which was even more marked in 2009 due to the effect of piracy on tourism to Aldabra after April. Aldabra's impact fees constituted a lower proportion of SIF's income in 2009 and this is expected to drop still further in 2010. The management and protection of Aldabra still account for the majority of SIF's expenditure while the running costs of the Vallée de Mai and Head Office costs remain similarly low as a proportion of expenditure (Figure 4).

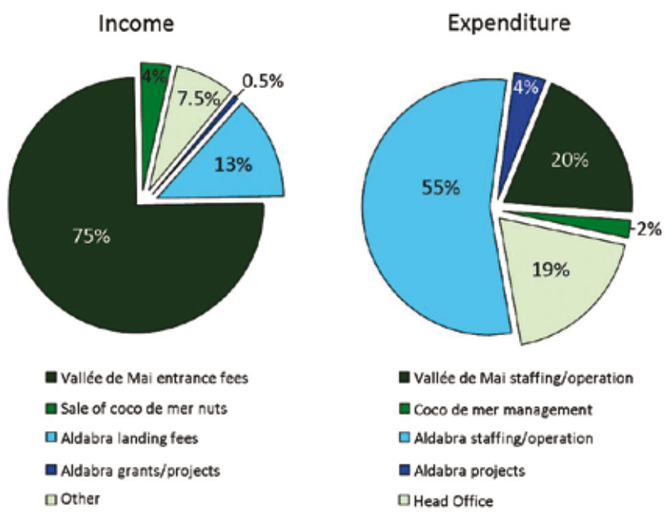


Figure 4: SIF income and expenditure break down for 2009.

2009 ARTICLES AND STAFF MOVEMENTS

Scientific publications on Aldabra and the Vallée de Mai (peer-reviewed)

- Frazier J. 2009. *Testudo gigantea* Schweigger, 1812 (currently *Geochelone* (*Aldabrachelys*) *gigantea*; Reptilia, Testudines): proposed conservation of usage of the scientific name by maintenance of a designated neotype, and suppression of *Testudo dussumieri* Gray, 1831 (currently *Dipsochelys dussumieri*). Bulletin of Zoological Nomenclature 66(1): 1-18 [and all subsequent issues in 2009 for follow-up debate of this issue]
- Pistorius PA & Taylor FE. 2009. Declining catch rates of reef fish in Aldabra's marine protected area. Aquatic Conservation: Marine and Freshwater Ecosystems 19: S2-S9
- Quanz C, Fleischer-Dogley F & Fruehauf M. 2009. Vereinbarkeit von Naturschutz und Tourismus auf den Seychellen - Projekte, Potentiale und Probleme. Hercynia 42: 1-20 [in German]

Newspaper and magazine articles

- 19th Jan: Eco-school winners back from rewarding trip to Aldabra. Seychelles Nation. Anon.
- 31st Jan: Vallée de Mai celebrates 25 years as a UNESCO World Heritage Site. Seychelles Nation. N. Bunbury.
- 2nd Feb. A plea for geoconservation. Seychelles Nation. P. Matyot
- 6th Mar: SIF celebrates Vallée de Mai 25-year anniversary with appreciation donation to STB. SIF
- 20th Apr: Getting it right for the coco de mer. Seychelles Nation. N. Bunbury
- 8th May. Interview with Dr Frauke Fleischer-Dogley. International Herald Tribune
- 31st Aug: Exciting frog find in Seychelles' Garden of Eden. Seychelles Nation. SIF
- 12th Oct: Antics of the Kato Nwar. Seychelles Nation. P. Matyot
- 31st Oct: Seychelles' natural heritage under threat: poaching of coco de mer nuts reaches Vallée de Mai. Seychelles Nation. SIF.
- November issue: Aldabra la Verte. Plongee (diving magazine). P. Kobeh [in French]
- November issue: Caspian terns on Aldabra Atoll. Seychelles Seabird Group: Seabird newsletter. N. Doak
- International coverage of the discovery of the Praslin *Sooglossus* frog population with a picture published on The Big Picture of the BBC's Science and Environment website (24th Aug) and information on the frogs posted on the Zoological Society of London's EDGE website (both postings by N. Doak)

SIF staff movements in 2009

- CEO Dr Frauke Fleischer-Dogley attended the COI meeting to review project documents for the development of a biodiversity programme for submission to the EU in Nairobi (February)
- Dr Fleischer-Dogley attended the UNESCO preparatory workshop for the Periodic Reporting Exercise and Statements of Outstanding Universal Value for the African region (March) in Dar es Salaam, Tanzania
- Vallée de Mai Site Manager Marc Jean-Baptiste attended the third regional meeting for Managers of Marine Protected Areas held in Reunion (17–19 June)
- The island restoration workshop run by the Island Conservation Society (23–26 June) was attended by several SIF staff and three SIF presentations were given (on the goat eradication, Aldabra rail translocation and sustainable financing)
- Science Coordinator Lindsay ChongSeng attended a workshop under the framework of the MPA Network Project of the Indian Ocean Commission (MPAN-IOC) in Antananarivo, Madagascar (24-27 November) for an ecoregional analysis of the WIO Marine Ecoregion to identify a network of priority zones for marine biodiversity and resources

MORE ABOUT SIF & HOW YOU CAN HELP

The Seychelles Islands Foundation (SIF) is a non-profit charitable organization which was established as a Public Trust in 1979 to manage and protect the Seychelles UNESCO World Heritage sites of Aldabra Atoll and the Vallée de Mai on Praslin.

To continue to run and protect these two sites, SIF relies on funding generated largely by visitor entry and impact fees to the Vallée de Mai and Aldabra, and supplemented by grants, donations and merchandise sales. Our work and progress will always be dependent on these sources and the generosity of our supporters.

There are a number of ways in which you can help us with this work:

- Visit the Vallée de Mai and experience the magic of this unique site for yourself.
- Purchase SIF products and souvenirs directly from the Vallée de Mai or the SIF Head Office in Mont Fleuri, Victoria.
- Donate to or fund-raise for SIF – all donations receive a 100% tax allowance
- Volunteer for SIF – we have limited volunteer opportunities at both sites for suitably qualified international volunteers to help for 4-6 month periods with ecotourism, conservation work and monitoring.

If you would like to contribute, would like more information or are interested in receiving further news about SIF please contact us by email: sif@seychelles.sc or check our website: www.sif.sc.

SIF supporters

We would like to thank the following supporters of SIF in 2009:

British High Commission
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Environment Trust Fund, Seychelles
ETH Zurich
Indian Ocean Commission
Indian Ocean Explorer
Island Development Company
Lydia Lablache, Britannia Hotel, Praslin
Mangroves for the Future
Mr Ernst Pichler (Honorary Lifetime Member)
ReCoMaP
Rufford Foundation
Silhouette Cruise
UNESCO

SIF is also grateful to the following associated researchers who worked with us, presented their research and ideas, helped to train our staff, gave their time and often resources freely, supervised students and stimulated exchange of ideas to advance the research and monitoring across the two sites:

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Dr Ross Wanless (Percy FitzPatrick Institute of African Ornithology, South Africa)

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We also thank the SIF Science Committee for their input and advice in what has been a productive year for science. Chaired by Lindsay ChongSeng the committee members are: Aldabra Marine Programme, Udo Engelhardt, Dr Frauke Fleischer-Dogley, Elvina Henriette, Pat Matyot, Dr Jeanne Mortimer, Jan Robinson, Dr David Rowat, Adrian Skerrett and Dr Michel Vely.