



Special Symposium Edition

This newsletter is a special edition to celebrate our Research and Conservation Symposium from Tuesday 14 May 2019. This was a free public event where we shared our latest research findings and conservation projects, and celebrated the 40th anniversary of Seychelles Islands Foundation. It was a fantastic day full of fascinating talks, question panels and video presentations. Over a hundred people attended the symposium and it gained significant press coverage. Thank you to everyone who joined us, we are happy to share summaries of the presentations for those of you who couldn't make it.



Dr Frauke Fleischer-Dogley, Chief Executive of SIF, opening the symposium and introducing SIF staff © SIF

Professor David Stoddart Scholarship

Dr Frauke Fleischer-Dogley, CEO at SIF, announced at the symposium that SIF will be now be offering its funded scholarship in honour of Professor David Stoddart on an annual basis. The scholarship is available for Seychellois who wish to study a three year Bachelor of Science (BSc) in Environmental Sciences at the

University of Seychelles.

Professor David Stoddart, OBE, was a British physical geographer known for his study of coral reefs and atolls. He discovered great biodiversity and documented the tortoise populations on Aldabra Atoll in the 1960s. His scientific study of Aldabra's habitat was instrumental in preventing the construction of a British military airfield on the atoll. By funding this scholarship in his honour, we aim to increase knowledge and understanding of the environment and conservation in Seychelles and contribute to the protection of its two UNESCO World Heritage sites.

If you would like to learn more about this scholarship, please contact hr@sif.sc.

Ring-necked parakeet eradication

Julio Agricole, Site Manager at the Vallée de Mai, presented a summary of SIF's successful ring-necked parakeet eradication project.



Julio presenting at the symposium © SIF

Earlier this year, Seychelles made history by becoming the first country in the world to eradicate an established population of the highly invasive ring-necked parakeet from the wild. SIF led the eradication project between

2013 and 2019.

The ring-necked parakeet is one of the most successful invasive birds in the world. It is the most widely introduced parrot species, with breeding populations in nearly 40 countries outside its native range. In Seychelles the parakeets posed a serious threat to Seychelles' national bird, the endemic Seychelles black parrot, which lives on Praslin. Although the ring-necked parakeets only lived on Mahé, if they had established a population on Praslin they would have aggressively competed with black parrots for nesting sites. Moreover, ring-necked parakeets carry a lethal parrot virus that may have infected the black parrots, as has happened with endemic echo parakeets in Mauritius. The ring-necked parakeet eradication was therefore necessary to protect the Seychelles black parrot.



Ring-necked parakeet © SIF

SIF started the national initiative to eradicate the species from the wild in 2011, partnering with the Ministry of Environment, Energy and Climate Change, the Seychelles Police Force and the Seychelles People's Defence Force. Their support, plus essential funding from the European Union, the Environment Trust

Fund Seychelles, and the Global Environment Facility, secured the success of the eradication. Over the six years of the project, 545 ring-necked parakeets were culled, 95% of these by shooting. The last known wild parakeet was culled in the Morne Blanc region of Mahé in August 2017, with no evidence of any remaining wild birds since then. The eradication was declared successful in early 2019.

The public information campaign was essential to carry out this project, and some members of the public supported the team and provided information on parakeet sightings. This public participation was especially useful in targeting the last elusive birds and led to Seychelles achieving its first successful eradication based on public participation, not to mention a world-first for this species.

Island ecosystems

April Burt, PhD student at Oxford University, UK, presented her research into island ecosystems in Seychelles and around the world via video.

Earth is home to over 100,000 islands, some of the most biodiverse and vulnerable ecosystems in the world. These unique areas face growing threats, such as the introduction of invasive species, habitat loss, and climatic changes. These threats are particularly at play in small island states such as Seychelles.

Despite £42 billion being spent annually on conservation efforts at biodiversity sites worldwide, the 2010 Aichi Biodiversity targets were not met. We need to make our efforts more effective. April is developing a quantitative questionnaire for island management practitioners to find out how our biodiversity-rich island ecosystems are being managed and monitored, and how this can be improved.

April is also researching Seychelles' coral reefs. Coral reefs are in decline globally, and bleaching events are becoming more frequent and severe.



Aldabra Atoll © Fotonatura

The healthier reefs are, the faster they can recover, and some reefs have a higher resistance to bleaching and temperature stress. Places like Aldabra may act as nurseries and produce larvae which repopulates coral in other areas. Aldabra's coral has responded differently to bleaching events between lagoon reefs and outer fringing reefs - April will investigate these differences at a genetic level. She has been collecting coral samples from a number of sites across Seychelles with the help of organisations such as Seychelles National Parks Authority, Global Vision International and Island Conservation Society.



April collecting plastic waste on Aldabra © SIF

The third part of April's research focuses on the threat of plastic pollution to island ecosystems. She worked with the Aldabra Clean-Up Project and Ocean Project Seychelles to investigate accumulation rates, composition and quantity of plastic waste arriving in Seychelles to inform how we can manage this threat in the future.

April will be working hard on these three research areas over the next year. She's looking forward to presenting her results and ultimately improving the outlook for these precious ecosystems.

Fish populations at Aldabra and Mahé Plateau

Dr Nathalie Bodin from Seychelles Fishing Authority (SFA), presented a summary of the joint research SIF and SFA have been doing into fish populations at Aldabra and the Mahé Plateau.

Aldabra's marine resources have been strictly



Nathalie presenting at the symposium © SIF

protected and conserved since the early 1980s and its fish community spared from negative human impacts such as overfishing. Unsurprisingly then, Aldabra has among the highest fish biomass in the Seychelles. The Seychelles Fishing Authority and SIF have teamed up to research the effect of human fishing pressures and assess how fish populations on the Mahé Plateau and the Outer Islands are linked.

The demersal (seafloor fish) structure research project aims to study the population of the fish between the Mahé Plateau and the outer islands by undertaking genetic analysis on fish which are sampled from these areas. This analysis looks at genetic differences in fish populations to gain insights into how these populations are structured (by gender or age).

The project also studies habitats and food web

dynamics between the islands using a multi-tracer analysis. This is a technique which tracks the presence of a large panel of essential nutrients such as minerals and polyunsaturated fatty acids, and contaminants such as mercury, which can't be broken down and are accumulated in fish through life and up the food chain. This research tells us about the food resources available to the fish and how they are consuming them.

The project selected two groupers, one snapper and one emperor as bioindicator fish species. So far, 127 fish from Aldabra and 175 fish from Mahé Plateau have been sampled. Preliminary results on multi-tracers showed significant differences in some minerals with higher levels of copper, iron, selenium as well as mercury and cadmium in fish from Aldabra compared to Mahé Plateau. This was however species-dependent. The remaining results from the multi-tracer approach and results from the genetic analysis are needed to understand better the dynamics of demersal fish populations in the Seychelles waters, and will be used for sustainable management for the fisheries.

SIF Vacancies

We have several vacancies at the head office on Mahé, the Vallée de Mai and Aldabra which need to be filled urgently. We are actively seeking Seychellois applicants for all of the positions. Details can be found on our website at <http://www.sif.sc/jobs> or contact HR on 432 17 35 if you are interested in any of the following positions:

Mahé:

- Science & Projects Coordinator (closing date 5 July)

Vallée de Mai:

- Two sales clerks

Aldabra:

- Electrical technician
- Marine mechanic
- Shopkeeper
- Logistics assistant with plumbing skills
- Relief skipper 60 NM

- Ranger/Boatman (with valid skipper license of 10 NM)
- Ranger
- Marine volunteer



Yellow crazy ants in the Vallée de Mai

Lorraine Cook, Project Officer at SIF Head Office, and Emmanuel Morel, Field Research Assistant at the Vallée de Mai, presented a summary of the work they have been doing to control Yellow crazy ants.



Lorraine presenting at the symposium © SIF

Yellow crazy ants are in the top 100 of the world's worst invasive species. They are notorious for their impacts on native ecosystems, species, people and agriculture. Their use of formic acid to attack and kill other species and their ability to form supercolonies gives them a devastating edge over other wildlife. Yellow crazy ants killed millions of endemic red crabs on Christmas Island which had a catastrophic effect on the whole ecosystem.

Yellow crazy ants are known as 'fourmi maldiv' in Creole because they were first seen in Seychelles in the Maldiv Village area around 1962. They

gradually spread all over Mahé and were first recorded on Praslin in 1975. After being detected in the Vallée de Mai in 2009, SIF has been monitoring the increase and spread of the invasive ants. They showed a slow spread at first which accelerated after 2015 to reach full coverage of the Vallée de Mai by 2018.



Emmanuel presenting at the symposium © SIF

Yellow crazy ants have an impact on many species in the Vallée de Mai. Endemic white slugs, snails, skinks, snakes, caecilians and parrot chicks are all highly vulnerable to their attacks. The decline of any of these species poses a major threat to the unique coco de mer forest, where many species are inter-connected and together form a healthy, functioning ecosystem.

To combat this threat we are continuing to monitor yellow crazy ant numbers, trialling control methods and doing education and outreach. We have researched methods for yellow crazy ant control that are being used successfully elsewhere, and reducing the numbers or even local eradication is considered achievable, and is what we are now aiming for. We intend to use a pesticide contained in small granules that will be distributed evenly across the forest floor. This should significantly reduce the yellow crazy ant population numbers and protect the long-term health of the Vallée de Mai.



Yellow crazy ants © SIF

Ten years of black parrot monitoring

Monica Griffith, Black Parrot Project Officer, and Terance Payet, Senior Ranger at the Vallée de Mai, presented a summary of SIF's black parrot monitoring work.



Monica presenting at the symposium © SIF

The Seychelles black parrot is the only endemic parrot species left in the Seychelles, and is only found on Praslin. Current population estimates suggest there are only 1700 birds left in the world. SIF set up the black parrot monitoring project ten years ago to monitor the breeding patterns of this unique, endangered species.

The habitat and terrain of Praslin makes studying the parrots very difficult, particularly as they prefer to nest in fragile, dead tree cavities. Although the breeding season is between November and March, there seem to be some years where they do not breed much at all. We are not yet sure why this is.



Terance presenting at the symposium © SIF

Black parrots seem to be quite picky about their nest holes but there does not appear to be a shortage of available cavities. However, nest failure rate is relatively high. In ten years, only 51% of nests have been successful and fledged at least one chick. And although there are many potential causes of failure (predation, yellow crazy ants, climate, food, disease), a main cause has not been possible to identify.



Black parrot in tree cavity © SIF

To assess how serious a problem rats are for nesting black parrots, SIF set up a rat control experiment. Rat traps were set up around certain black parrot nest trees to see if this improved the numbers of successful nests. The results suggest that rats are a major cause of nest failure, but not the only one. More nests succeed when there is rat trapping but some still fail, while some also succeed without trapping. More monitoring and possibly experimental

work is needed to determine the impacts of rats and other factors on black parrot breeding success.



Two black parrot chicks © SIF

We will continue researching to pinpoint the causes of our why so many black parrot nests do not produce healthy adult birds. The sooner we can understand these causes the more effectively we can protect this unique endangered species.

Reptiles and amphibians in the Vallée de Mai

Louise McLaughlin, Herpetofauna Officer at the Vallée de Mai, presented her findings from her herpetofauna surveying work.



Louise presenting at the symposium © SIF

The Vallée de Mai is a hotspot for 'herpetofauna' (reptiles and amphibians), with an incredibly high concentration of endemic species in its small area.

Louise is currently surveying several species of gecko in the palm forest, as there is very limited information on their ecology and population. We can't protect them if we don't know how many there are or where they occur. Locals, guides and researchers working in the Vallée de Mai have all commented that herpetofauna have declined over the past few years, particularly geckos. This coincides with a dramatic increase in yellow crazy ants, although we do not know for sure whether the two trends are connected.



Giant bronze gecko © Chris Kaiser-Bunbury

Poaching for the exotic pet trade is also an issue for herpetofauna, particularly the giant bronze geckos, and we suspect that it has heavily impacted the gecko population over the last two years. The Vallée de Mai is part of a mature palm forest ecosystem, which relies on its herpetofauna for ecosystem functions such as pollination, seed dispersal and ultimately survival.

Louise is surveying the herpetofauna using a distance sampling method, in which researchers walk along transects (fixed pathways) twice a day, recording the animals they see along the way. This is a difficult task as they are hard to spot! The results therefore underestimate the true numbers but they provide comparable data to show trends over time. The dwarf bronze gecko was seen the most frequently, with over 60 sightings, which is enough to estimate the overall population numbers in the Vallée de Mai.



Seychelles tree frog © D. Pouponeau

We will continue to do these surveys every two years so we can compare the results and determine any trends in the population over time. We will also be engaging in local awareness and education to discourage poaching. These animals are in urgent need of protection as they are not found anywhere else in the world. Once they are gone, they will be gone forever.

Plant Phenology

Katy Collins, Research volunteer at the Vallée de Mai, presented her findings from her data analysis on phenology.

Research staff at the Vallée de Mai have been collecting data on plant phenology over the last ten years. Phenology is the study of seasonal plant and animal life cycles, using global climate change research to monitor, understand and predict the timings of recurrent events in nature.



Katy presenting at the symposium © SIF

The aim of this research is to determine when plants produce flowers and fruit, how these events respond to climatic factors such as rainfall, what links there are between fruiting events and the black parrot breeding season, and whether any plants need immediate conservation action.



Coco de mer trees © SIF

Currently, 90 individual trees of 18 different species are surveyed by two members of the research team, every two weeks. Surveys consist of estimating the percentage of buds, flowers and fruits, then, if there are fruits, the amount that are ripe is also estimated.



Coco de mer leaves © SIF

Katy has been looking at the data collected in the last 10 years to try and answer these research aims. Analysing the data can help us to understand how the plants are likely to respond to climate anomalies such as periods of drought or flooding. If we can discover links between the plants and the black parrot breeding season, then we can predict what might happen as our climate changes, and help conserve the unique ecosystem at the Vallée de Mai.

Coco de mer: The true value

Unisey BSc Environmental Science student, Mariette Dine, shared the results of her BSc environmental project focused on the true monetary value of the coco de mer. Her research aims to achieve better informed management decisions against overharvesting and poaching of the coco de mer which is a threat to forest ecosystems on Praslin. The chosen study sites included Vallée de Mai, Fond-Ferdinand, Curieuse and Mahé Island.

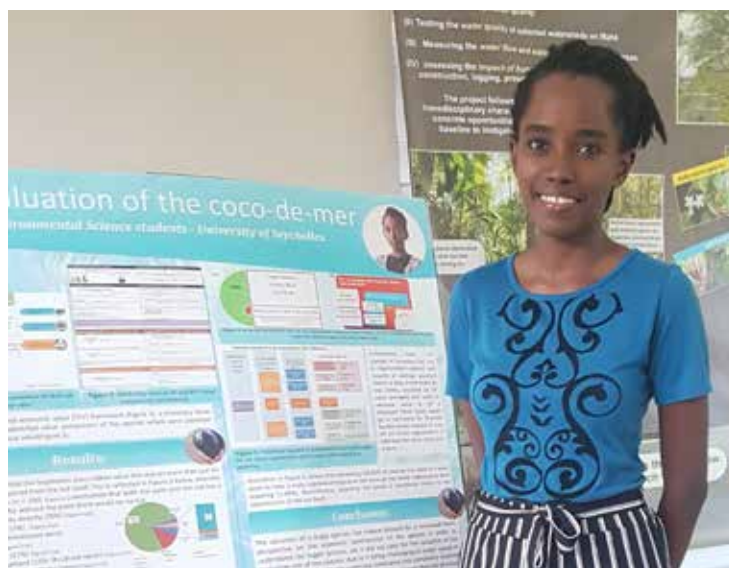
Mariette's project used the total economic value (TEV) framework to assess the value of the coco de mer. She interviewed and surveyed key individuals, experts and stakeholders such as staff from SIF, Seychelles National Parks Authority (SNPA), the Ministry of Environment Energy and Climate Change (MEECC), Fond Ferdinand and Curieuse, plus kernel exporters, tour guides, souvenir shops and the Praslin and Mahé community.



Mariette presenting at the symposium © SIF

76% of those surveyed said they saw the direct benefits of the coco de mer to the Seychelles. Very few respondents (5%) said they did not see any benefit. Tourism was cited as the main benefit (mentioned by 40% of respondents).

The loss of one nut to poaching is a 99% loss on its direct market value to the legal market with substantial impacts on coco de mer reproduction. Average results also showed that 10.5% of coco de mer nuts in the Vallée de Mai are harvested in a year, 2.49% are poached and 2.49% go towards forest regeneration. The remaining 84.5% of nuts are staying in the Vallée de Mai. Increased regeneration can be implemented in other reserves such as Curieuse Island, where there is no scheme or project in place to protect coco de mer regeneration.



Mariette presenting her research findings © SIF

Mariette's research estimated the TEV of the species at \$2.89 million for 2018. However not all factors were captured due to the time-frame and limited scope of the study. Collaboration from all

stakeholders and the insights of experts in natural economics is needed to provide a fuller picture.



Aldabra Clean-Up Project

Jeremy Raguain, Project Officer at SIF Head Office, summarised the outcomes from the Aldabra Clean-Up Project which he had managed with great success. He also made an exciting new announcement!



Jeremy presenting at the symposium © SIF

The world-famous UNESCO World Heritage site, Aldabra Atoll, is one of the most remote islands on Earth. It is home to pristine marine and terrestrial ecosystems, and a huge variety of incredible wildlife. Sadly, this natural treasure is under threat from plastic pollution. Plastic waste is dumped into the ocean and washes up on Aldabra's coastlines, polluting the water and threatening the wildlife. Clearing this waste from Aldabra had been on

SIF's agenda for years, but the atoll's isolation and difficulty to access, combined with the overwhelming quantity of rubbish arriving, was too great for SIF to tackle alone.

So SIF joined forces with Queens College, University of Oxford, to form the Aldabra Clean-Up Project, an ambitious expedition that aimed to clear the waste and raise awareness of plastic pollution. The project achieved 148% of its fundraising target, raising SCR 3.9 million! The awareness-raising campaign educated local and international audiences, with Sky News' coverage reaching millions of people around the world.

Those who took part in the clean-up worked hard and endured considerable hardships. Maps and photos highlighted the scale of the operation along with its hazards. But statistics revealed the tangible outcomes; 25.75 tonnes of plastic pollution was removed from Aldabra's south coast, and a baseline for future scientific research on the issue was established.

The next step is reprocessing the collected waste, which is being stored by the Seychelles Government's Landscape and Waste Management Agency. Those who are interested in reusing, recycling or repurposing the plastic should contact SIF.



Reprocessing collected waste from Aldabra © SIF

Jeremy announced at the symposium that SIF's Board of Trustees have approved a second clean-up

expedition to go to Aldabra. This will take place in the next two to three years depending on resources. Protecting this beautiful and fragile ecosystem is a priority, and you will be hearing more from SIF on this soon!

Coral reef recovery at Aldabra

Anna Koester, PhD student at the University of Bremen, presented her research into Aldabra's coral reefs via video.

Coral reefs are fascinating and complex ecosystems which provide food and shelter to a multitude of life forms. Mass coral bleaching events have dramatically impacted coral reefs worldwide. Global warming means there will be ever shorter time frames between such events, and our reefs will have less and less time to recover.

Coral cover at Aldabra reduced by around 50% after the most recent 2016 bleaching event, but inside the lagoon corals seem to have fared better. The masses of water that enter and leave the lagoon at high and low tide create a variable environment for corals to live in. Water temperatures here can change by as much as 7°C within a single day! Lagoon corals are therefore adapted to extreme temperature changes and can better withstand the abnormally high temperatures they experienced during the bleaching.



Anna examining coral tiles © Anna Koester

Anna and SIF have been following the recovery of Aldabra's reefs through the Aldabra Reef Monitoring Programme, and can already see positive signs three years after the bleaching event. The juvenile coral density is almost the same as before the bleaching and inside the lagoon, coral cover is back to about 70% of pre-bleaching amount.

Alongside the reef monitoring, Anna and the SIF Aldabra team have been studying coral reproduction by leaving terracotta tiles on the reefs. Two months later they count the number of little corals that have settled as larvae on the underside of the tiles. The last tiles will be taken out this August, but they have already encountered high numbers of up to 120 baby corals per tile!



Terracotta tile on coral reef © Anna Koester

There is still much work to do to better understand the recovery of Aldabra's reefs, and we're excited about what we will discover. For now this means full-time data analysis and write-up for Anna!

Biosecurity on Aldabra

Christina Quantz, Project Coordinator at SIF Head Office, presented a summary of SIF's ongoing biosecurity work on Aldabra.

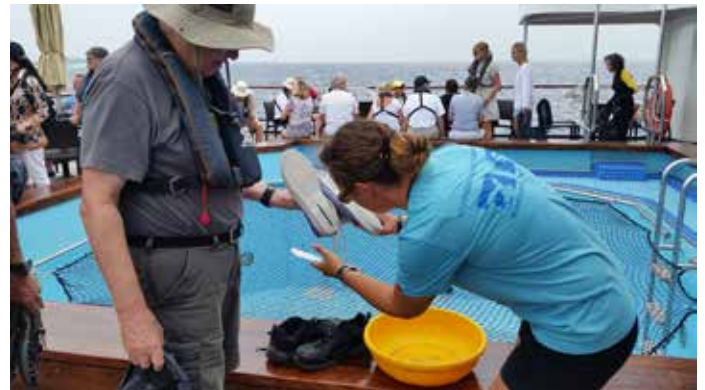
Invasive species are widely recognized as a major threat to biodiversity, and their impacts can be devastating for native species and entire ecosystems.



Christina presenting at the symposium © SIF

Preventing the introduction of invasive alien species (IAS) requires far fewer resources than would be needed to respond to a pest incursion or an eradication. The chances of intercepting an IAS are significantly higher before they arrive on an island. It is therefore essential to have well-established prevention and detection procedures, as well as emergency response measures in place, to minimise the risk of establishment and the subsequent need for an eradication.

SIF's recent COI-funded biosecurity project ensured that international biosecurity measures and best practices were implemented to ensure



SIF staff carrying out biosecurity procedures © SIF

successful IAS interception as early as possible. Establishing the necessary biosecurity facilities and equipment was a top priority and an important achievement. The project also helped to review and strengthen SIF's biosecurity plan, including ID guides for relevant invasive plant and animal species, incursion response procedures, and

education for staff on the prevention and potential eradication of invasive species. You can watch a [video about this here](#).

Despite the project having officially ended, SIF is now even more committed and our staff have a greater understanding of biosecurity measures as ongoing tasks and a job that will never be completed. Maintaining biosecurity measures for Aldabra requires an annual budget of approximately \$89,000. This, however, is a small cost compared to \$290 million for a potential ant eradication (with no guarantee of success), or \$9 million for a rat or cat eradication on Aldabra. The team is determined to maintain and enhance Aldabra's biosecurity measures to protect Aldabra's native flora and fauna, and preserve this unique and precious ecosystem.

Reef fish and seafloor habitats

Philip Haupt, PhD student at Rhodes University, worked at SIF between 2011 and 2015 when he carried out his research on reef fish and seafloor habitats at Aldabra. He presented a summary of his work via video.

Philip looked at the distribution of coral reefs around Aldabra, using satellite imagery of the atoll to map the different habitat types. He then divided these habitats into six different categories.

Philip looked at the variety and abundance of fish in these habitats using remote underwater video technology. He compared the difference between these fish populations when using baited underwater video cameras, and unbaited, to see if the technology was affecting the presence of the fish.

Philip found that there were significantly more carnivorous fish (those who eat other fish, as opposed to plant material) in the baited videos. However in the unbaited videos both types of fish were more abundant and more diverse. This has implications for how we use this technology in future and what we use it for. The presence of the bait seems to override other environmental variables

and skew the data, as the fish behave differently to how they naturally would. Baited video cameras are good at standardising fish surveys, so it is easy to compare numbers of fish over time. Unbaited cameras are better at measuring the impact of the ecological environment on fish populations.

Philip's analysis also found similar types of fish in similar habitat types. To ensure we are preserving all the different species of fish in Aldabra's reefs, we therefore need to preserve all the different



Philip carrying out research at Aldabra © Philip Haupt

habitat types. Sharks live in all the habitats and also beyond the atoll, so we need to consider how we protect other atolls to ensure that Aldabra's reef sharks are protected.

Philip's research provided extremely useful insights into how we protect and manage marine habitats around Aldabra and the species that rely on them.

Aldabra's sisal eradication

Dr Nancy Bunbury, Director of Research and Conservation at SIF, presented an overview of SIF's successful sisal eradication project.

Seychelles Islands Foundation has successfully eradicated the invasive plant sisal (*Agave sisalana*) from Aldabra. This unusually large, sharp and spiky plant, which originates from Mexico,



Nancy presenting at the symposium © SIF

Seychelles Islands Foundation has successfully eradicated the invasive plant sisal (*Agave sisalana*) from Aldabra. This unusually large, sharp and spiky plant, which originates from Mexico, competes with native flora in the areas it invades and reduces biodiversity. Its toxic sap causes burning and irritation.

Sisal was first recorded on Aldabra in 1956, and there have been numerous attempts to remove it ever since. SIF manually cleared a sisal patch from the island of Malabar in 2005, but similar efforts were unsuccessful in Picard, Polymnie and Ile Michel where the plant continued to reappear.



Invasive plant sisal © SIF

New approaches were needed. Removing sisal manually is time-consuming and difficult, and its success is often short-lived. Herbicide was considered more effective, reaching the roots of the plants and preventing re-growth. The selected herbicide has a rapid breakdown time in sunlight and can be applied locally, limiting exposure

to the surrounding vegetation which SIF was so desperate to protect.

So in 2014, after testing and comparing different approaches, SIF treated every single sisal plant by cutting the stems and applying 30% strength herbicide. Multiple treatments were needed to achieve SIF's goal of eradication at all sites on Aldabra. Once the herbicide treatments were completed, the results looked dramatic, but the next stage was to monitor the sites to see if any sisal grew back.

Picard and Polymnie remained free of sisal, but the plant regrew on Ile Michel after the wet season. SIF re-applied the treatment and continued monitoring. They needed Ile Michel to be free of new sisal growth for over two years before it could be considered in the clear.



Sisal eradication team on Aldabra © SIF

The final monitoring trip was in December 2018 and Ile Michel was clear! SIF was proud to announce in January that the plant had been successfully eradicated from Aldabra, a huge step in protecting its biodiversity and terrestrial ecosystem.

Monitoring Aldabra's reef

Jennifer Appoo, Science and Projects Coordinator at SIF Head Office, presented a summary of SIF's Aldabra reef monitoring work.



Jennifer presenting at the symposium © SIF

Coral reefs on Aldabra have been isolated and protected from human pressure for a long time. Aldabra has been a marine protected area for almost 40 years, and is the largest in the whole of Seychelles. The reefs are semi-pristine and are of great international and scientific importance.

In 2013, SIF started the Aldabra reef monitoring programme to study the marine biodiversity and ecological processes in this unique and remote area. The reef monitoring takes place at several sites on the atoll and focuses on five main components of the reef system; water level and temperature, seafloor communities, fish communities, coral and marine predators. We use different methods to monitor the reef, including underwater dataloggers, taking photos of the reef, counting fish and new corals and filming videos of marine predators.



Aldabra reef monitoring © SIF

Over the last six years, we've managed to document some of the main trends and changes on the reef. For example, water temperature is lowest between August and September but highest from December to May. We've seen how hard coral cover decreased dramatically after the 2016 coral bleaching event and numbers of plant eating fish increased. We've also recorded an increase in new corals after the bleaching which is a good sign for reef recovery.

Although faced with many challenges such as bad sea and weather conditions and boat issues, the monitoring programme has been successful in documenting Aldabra's reef ecology and response to environmental change. In addition, several research collaborations through PhD and Masters projects have stemmed from the monitoring programme to provide complimentary information on coral reef ecology.

Aldabra Research

The Aldabra team managed to join the event remotely with a lively video presentation in which all members of the team, led by Aldabra Science Coordinator Cheryl Sanchez, presented different aspects of the research taking place there.

One of the most basic but important questions when monitoring a species is, how is the population doing? Are the numbers decreasing? Are they increasing? Is the population stable? Even though Aldabra is highly isolated, humans have still had a big impact on its ecosystem, mostly on the terrestrial side (such as introducing invasive species, harvesting and poaching).



Aldabra research team © SIF

Once declared a Nature Reserve, then a UNESCO World Heritage Site, the protection afforded to the atoll in the early 80s created an environment in which species were able to recover. This is demonstrated by green turtle counts in the long term data that SIF has collected on Aldabra. There's no denying it - the trend, particularly for Settlement Beach, is an incredible conservation success story, and just last year there were record breaking numbers! Another iconic species, the giant tortoise, has shown a very stable population trend, and a recent improvement to SIF's monitoring methods has allowed the first tortoise population estimate to be made in decades. Let's just say, the numbers are very encouraging.

Improving monitoring has been a priority for SIF on Aldabra over the past five years, and our findings have led to outside researchers starting new projects to look into concerning trends. One example is the declining trend in nesting attempts by red-tailed tropicbirds. Dr Annette Fayet, a Junior Fellow Researcher from Oxford University, UK, has spent two field seasons on Aldabra to look into the ecology of the two tropicbird species there and investigate reasons for nest failure. Although the field seasons have recently concluded, the preliminary data is proving to be extremely important.

The Aldabra research station has made incredible achievements over the years. This is due to the hard work and dedication of all the staff who have worked on Aldabra, and the dedicated SIF staff at Head Office who have kept the station and the programmes running to a high standard. Thanks to all who have been involved, in any and all ways!

Seychelles' largest mangrove forest

Annabelle Constance, PhD student at the University of Zurich, presented her research into Aldabra's mangrove forests via video.

You have probably heard that mangrove forests are decreasing globally. This is certainly true in most of the Seychelles, but what about islands like Aldabra,

where there is limited human influence?

Mangroves are an important nutrient source for a whole host of species living in and around Aldabra Atoll including sharks, birds, mammals and invertebrates. Some mangroves assist with soil development by holding soil together, which in time allows for mature forests to develop on the atoll. This then creates a habitat for wildlife which can use the forest to shelter. Since the 1980s, 35% of the world's mangroves have been lost to development and conversion. In addition, sea level rise in the Indian Ocean has accelerated over the past decade, which further threatens mangroves.



Annabelle in mangrove habitat on Aldabra © SIF

Annabelle wants to understand how the mangroves on Aldabra are responding to these changes. She used satellite images to track how the size of the mangrove forest had changed on the atoll over the years, and found that it had actually increased substantially between 1995 and 2009! However there were also areas where mangroves were lost, particularly some of the mature forests on Malabar. She will be further analysing these changes to understand why they are happening.

Annabelle will be carrying out field work in Aldabra in 2019 to research the mangrove species and their environments. She will also use modelling to understand the drivers of change which are affecting these forests. If the mangrove habitats on Aldabra were to decline, this could have severe implications for many biological communities on the atoll. Annabelle hopes her research will improve our understanding of mangrove ecology in low-lying islands so that we can better predict changes to these important habitats.

You can download or subscribe to the newsletter at www.sif.sc

Articles contributed by: Jeremy Raguain, Anna Koester, Christina Quantz, Sophie Adams, Jennifer Appoo, Cheryl Sanchez, Lorraine Cook, Monica Griffith, Katy Collins and Mariette Dine.

Edited by: Jennifer Appoo, Sophie Adams and Nancy Bunbury.