Zwazo

Number 24 Seychelles conservation magazine

Science and Conservation Hand in Hand

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Photo: Under the Sea (Alec Taylor)

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Zwazo

Zwazo is produced biannually by Nature Seychelles, a non-profit, non-governmental organization that has worked in conservation in Seychelles since 1998. Its primary objective is to improve the conservation of biodiversity through science, education, awareness and training programmes. To achieve this we are dependent on voluntary support and funding. If you would like to help this work, please contact us at the address below.

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A word from the

FRONT LINES

From Knowing to Doing

The Seychelles warbler will soon be the first bird species once classified as Critically Endangered to be taken off Birdlife International's list of Threatened Birds of The World because of conservation action. For years this bird was known as the Brush Warbler because when the last population was discovered on Cousin Island it was in brush among the small area of mangroves.

It was not until research on the ecological requirements of the species and habitat restoration following the science that it was proven the bird did not really like brush – the mangrove happened to be the only natural habitat that had not been converted to plantation.

Science has also proven other conventional wisdom to be wrong. Everyone including ornithologists believed that the Seychelles Flycatcher or Vev needed wetlands to survive. But Nature Seychelles researchers discovered something else: the species needs mature woodlands... and a lot of woodland on La Digue Island, the stronghold of the bird, just so happens to be around wetlands. Woodlands of the appropriate species of tree were created on Denis Island by Nature Seychelles and the species was successfully translocated there.

The list goes on. The point is that environmental action needs to be informed by science. At Nature Seychelles we try to ensure that our work is underpinned by relevant research some of which is ongoing. In this issue of Zwazo, some of this research is described. Scientific work on other issues is also explained in articles by authors from Seychelles and around the region. I hope you will enjoy this issue of Zwazo. Happy reading.

Nirmal Shah

Nature Seychelles Wins International Innovation Prize

The World Leisure Organisation (WLO) has awarded the 2011 International Innovation Prize to Nature Seychelles. The prize was given for innovative efforts to use the environment for "edutainment" programs at the Sanctuary at Roche Caiman. And at a glittering ceremony in Hangzhou, China on 18 November, alongside two other winners, Dr. Nirmal Shah Nature Seychelles' Chief Executive collected the prize, called 'George'in honour of Dr George Torkildsen (1934 – 2005) the first WLO Prize Committee Chair and past World Leisure Organization Board Chair.

"**I would like to join the community to express to you the appreciation and congratulations of the President and our office for this excellent achievement," Mr Barry Faure, Secretary of State, Office of the President in Seychelles** said in a congratulatory message to Nature Seychelles.

And adding his congratulations, **Bernard Elizabeth, the Chair of LUNGOS (Liaison Unit of Non-Governmental Organisations of Seychelles) said, "Your success is a reflection of the civil society's capacity to be innovative in such fields as environment and nature conservation."**

The WLO prize recognises organisations that have implemented creative solutions to foster local, national, or international leisure opportunities for the benefit and development of individuals and communities. Leisure includes play, recreation, the arts and culture, sports, festivals and celebrations, health and fitness, or travel and tourism.

Activities at the Sanctuary are targeted at improving participant well-being by nurturing and harnessing the power of nature. They also help people to appreciate nature. Schools, community groups and local people come for outdoor activities that include classes for children and nature-based physical and mental exercise for all ages. All of these elements combine to make the Sanctuary an inspirational place offering leisure with a purpose for all sectors of society.

"The best way to promote protection of the environment is to get people to value nature. We have been implementing environmental programs that provide values of one kind or another to various groups over the years. **Recently we have focused on linking nature to people's physical and mental well being. It's wonderful that a leading international organization has recognized this innovation.** This is a team effort and the coordinators of our various programs need to be congratulated for their hard work," Shah said.

Mr. Pat Nanty, the Chair and CEO of the Seychelles Heritage Foundation and a member of the International Jury for the Prize said, "I am extremely delighted at this achievement more so as since my association with the WLO this is the first time that the Prize has been won by an entry from a small country. This is a prestigious award from a serious organisation as it recognizes accessibility to leisure as a Human Right and highlights its educational and life-enriching values."

Photos: Top - Nirmal Shah receives the prize in Hangzhou, China. Bottom - Team effort, staff were excited to be so honoured.

The Most Amazing Conservation Success Story in Seychelles

Fifty nine Seychelles Warblers (*Acrocephalus sechellensis*) have found a home on Frégate Island after being transferred there from Cousin Island Special Reserve as a result of a Nature Seychelles-led initiative .

The transfer was carried out on 7 and 14 December 2011 to start a new breeding population on Frégate Island, making it the fifth island in Seychelles to hold this charming little bird.

"It will pave the way for this bird, once said to be "one of the rarest birds in the world," to eventually come off BirdLife International's Endangered Birds of the World list. We have been trying to get this project off the ground for a very long time and we have to thank Frégate Island management for agreeing to partner with us and take the warblers," said Nirmal Shah, CEO of Nature Seychelles.

"It is another step in our efforts to fully restore this island and to support the conservation of the unique and indigenous species of this country," said Ian Barbour, Frégate Island General Manager.

The project is funded by a Disney Conservation Fund project to Nature Seychelles through the Royal Society for the Protection of Birds (BirdLife UK), the Seychelles Warbler Research Group (a collaboration between the Universities of East Anglia and Sheffield in the UK,

Photos: Top - The Seychelles warblers could eventually come off the endangered list (Martijn Hammers).

Bottom - Next stop Fregate for Cousin's warblers.

and the University of Groningen, Netherlands) and Frégate Island Private. The translocation proposal was developed and submitted by Nature Seychelles to the Department of Environment. "They readily agreed to it because of the potential ground breaking results for conservation worldwide," says Shah.

The operation involved a team from Nature Seychelles, the Seychelles Warbler Research Group, and Frégate Island. Birds were transferred using what is called the "hard release" method. They were captured in the morning, transferred by Helicopter Seychelles - which is quick and less stressful, and were released on Frégate by afternoon of the same day.

The Warbler group will be monitoring the population on Frégate for the next few years.

"Seychelles is an exemplar of how science and conservation can go hand in hand, and this is a brilliant opportunity to continue studying the Warbler's evolution and behaviour," says Dr. David Richardson of the University of East Anglia.

The warbler has come a long way from the days it neared extinction in the 1960s. Then, a world population of 26 was found only on Cousin. An international campaign, which resulted in the purchase of Cousin by Birdlife International, and conservation action saw a complete turn-around for this bird. From Cousin, BirdLife International and Nature Seychelles started new populations, in line with the Species Action Plan, on Cousine, Aride, and Denis Islands in order to secure its long-term survival.

"If the population takes off on Frégate as we expect, it will be the first bird species in the world once classified as Critically Endangered to be removed from Birdlife International's threatened birds of the world list because of conservation action," says Shah.

"In 1969, the Red Book, the forerunner of the Red List, had said the Seychelles Warbler could well become extinct in our time. We can now say the Seychelles Warbler was saved in our time - definitely the most amazing conservation success story in Seychelles," Shah says with a smile.

Universities Invest in Cousin

Since Seychelles lacks scientific expertise is many fields Nature Seychelles has been working with universities for the past 10 years. The objective is to fill in key information gaps and to inform conservation management action with good science. Nature Seychelles has signed Memorandums of Understanding with several Universities and through these partnerships has supported Masters and PhD students, organised training courses for Seychellois practitioners in Seychelles, facilitated scholarships for local candidates and received expertise to conduct delicate and difficult conservation activities such as translocation of threatened birds.

In July, Nature Seychelles received a grant of 40,000 Sterling Pounds from the Universities of East Anglia and Sheffield to upgrade the Field Station on Cousin Island Special Reserve. The funds will be used to repair the facility, upgrade equipment and materials for researchers, students and volunteers and generally make for a better working environment. **"The Field Station was set up by BirdLife International in 1971. It has served hundreds of students and researchers since.** Over two hundred reports and papers have been published on Cousin," said Nirmal Shah the CEO of Nature Seychelles.

An agreement was signed between Nature Seychelles and the universities, which among other things lays the framework for continued cooperation for the implementation of further research that will enhance conservation.

"Cousin Island Special Reserve is a perfect model for doing scientific research. We invested in it because it's a natural laboratory where you can do controlled research in a contained, yet very natural, wild environment," said Dr. David Richardson of the University of East Anglia, which is part of the Seychelles Warbler Research Group, when he signed the agreement with Nirmal Shah.

Seychelles Warblers have been the subjects of intensive ongoing research by the warbler group since 1988. "The Seychelles Warbler is the most researched species in Seychelles with more published papers on it than any other animal or plant in this country. What this large body of research has yielded is one of the world's best animal models in the wild," says Nirmal Shah.

"Continuous monitoring and research over a period of almost 25 years has covered many aspects of the species biology making it the most extensive, productive and high profile study ever to be undertaken on an island bird," adds Richardson.

The group has given scientific and public talks locally and throughout the world and has published papers in leading journals on many aspects of the warblers' biology. Richardson delivered a talk on how science and conservation works hand in hand at Nature Seychelles on 14th July.

"We are in a unique position to act as a platform for receiving people who will become our champions and ambassadors in the international scientific community. This is a unique privilege," concludes Shah.

Partnership for the Seychelles Paradise Flycatcher

Nature Seychelles and the Seychelles National Parks Authority (SNPA) have joined forces to work on a new project to help protect one of Seychelles iconic bird species – the Seychelles Paradise Flycatcher.

To formalise this partnership, a Memorandum of Agreement was signed on 19 October 2011 by the CEOs of the two organisations Nirmal Shah and Denis Matatiken. Present at the signing were Mrs Barbara Barallon, the District Administrator for La Digue (the stronghold of the flycatcher), and Mr. Flavien Joubert, Director General in the Department of Environment.

"Partnerships are crucial for conservation and have been used to save most of Seychelles endangered birds. The combined effort of conservation NGOs, government, businesses, and the community is probably the most powerful tool available to us to address conservation issues in Seychelles," said Shah.

"This is a good example of partnerships between government, NGOs and communities where all stakeholders are involved in conservation," said Mr. Matatiken. "Conservation is everyone's business and the little that we can all do contributes to the conservation of a species."

The project will see work carried out on La Digue with schools and local communities. It will build on the success of previous projects by helping to engage the local community in activities to protect the bird.

Concentrating on the Veuve reserve, work will be done in schools and new ways to involve the local people and visitors in securing the future for the bird will be developed. The SNPA, which manages the Veuve reserve, will support the implementation of this project by integrating it with its program on La Digue.

The paradise flycatcher, one of the most beautiful and iconic birds of Seychelles, is still listed as Critically Endangered, the highest threat category on the World Conservation Union (IUCN) list of threatened species because of its small population and small range limited mostly to La Digue.

A previous collaboration, which brought together various partners, resulted in the successful translocation of 23 birds to Denis Island to create "a safety net" population there. The translocation established a second breeding population of flycatchers and marked a major milestone in the Species Action Plan for the Flycatcher aimed at removing it from the list of endangered species.

The new project will focus on further enhancing the population on La Digue. "This population is now threatened by habitat loss, invasive alien species and encroaching urbanisation. We hope to build on local support for its conservation," Shah says.

The project has the approval of the La Digue Development Board, which is a very important partner in saving the flycatcher and its habitats. It is part of a global preventing extinctions programme led by BirdLife International (Nature Seychelles is a BirdLife partner) and is supported by Viking Optical, the species champion who help raise the vital funding needed to prevent extinctions.

Photo: Top - Nirmal Shah and Denis Matatiken sign agreement for the Flycatcher Bottom: Female Paradise Flycatcher (Jeff Watson)

Habitat Danger for the Flycatcher

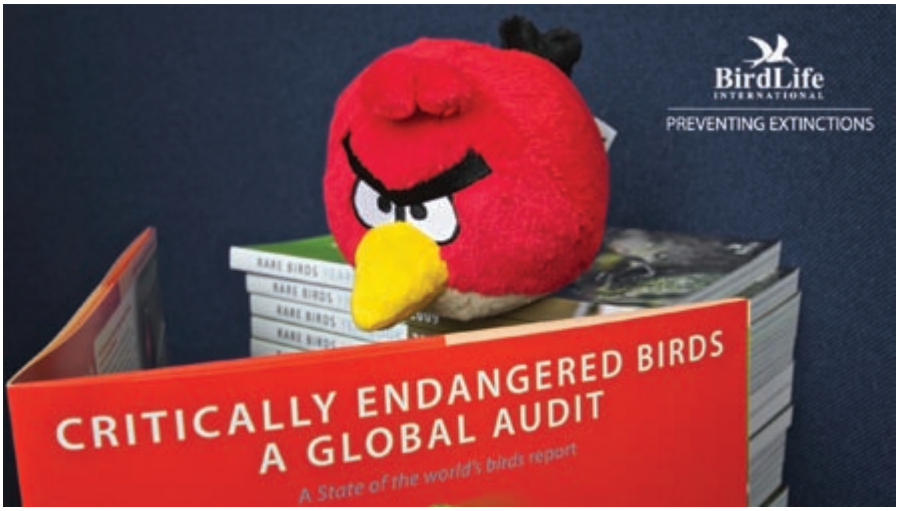
Illegal felling of mature trees on La Digue Island, the home of the Seychelles Paradise flycatcher has been exposed recently by local media. In a front page article, the newspaper Le Seychelles Hebdo revealed damage that includes the felling and cropping of several native tree species used by the bird.

According to the paper, the owner of the land had made an application for a tourism development but the Department of Environment had put this on hold so as to carry out a survey. The owner apparently went ahead with land clearing. Clearing of land and felling of the tree species in question which are protected by law require authorisation by the land use and planning authority and the Department of Environment respectively.

The land owner and the contractor who undertook the works have been fined 50,000 Seychelles Rupees each (about US$ 4,000) by the environment authorities.

Photo courtesy of Le Seychellois Hebdo

Angry Birds Fight Extinctions!



Rovio, world-leading entertainment media company and creator of the unprecedented global gaming phenomenon Angry Birds, has teamed up with BirdLife International (Nature Seychelles is BirdLife Partner) to fight extinctions.

On Friday Dec 1, 2011, **Rovio launched an exciting new Angry Birds campaigning website (http://birdlife.angrybirds.com) to support the BirdLife Preventing Extinctions Programme, which locally supports work for the Seychelles Paradise Flycatcher.**

Through the website, millions of Angry Birds fans are being asked to play the latest version of Angry Birds for Chrome online, to get angry about extinctions and to make a donation, thus providing vital help for 'the world's 189 angriest birds,' - those listed as Critically Endangered on the Red List.

"We are delighted to support BirdLife International with this new Angry Birds initiative," said Peter Vesterbacka - Rovio's Mighty Eagle and CMO. "We are pleased to be in a position to help such important conservation action and anticipate our loyal fans will respond very positively to our Angry Birds call to Get Angry and Fight Back."

"This is a very exciting opportunity for BirdLife", said Jim Lawrence - BirdLife International's Preventing Extinctions Programme Manager. "We are thrilled to be Angry Birds' charity of choice and we look forward to seeing how this exciting campaign develops and our future relationship evolves."

The Seychelles Paradise Flycatcher is one of the ten BirdLife flagship preventing extinctions projects highlighted on the gaming website. The website encourages and helps Angry Birds' fans to find out more about these extraordinary species and how the BirdLife International Partnership is helping them.

"This is what makes this so amazing, the opportunity to expose this special bird of Seychelles to millions of people," says Dr. Martin Varley, Nature Seychelles' Community and Stakeholder Action Coordinator who is managing the new education and awareness campaign the organisation is running for the bird.

With half a billion game downloads, Angry Birds is one of the most downloaded games in the history of gaming and has a religious following that does not seem to be slowing down.

The new campaigning website by Angry Birds is one of several innovative BirdLife Preventing Extinctions Programme initiatives that have been developed recently, in conjunction with Species Champions, to reach out to new audiences and raise awareness and funds for the BirdLife Partnership's work.

Photo: Campaign will help the Preventing Extinctions Programme

A Daily Dose of Green:
Green Health Programme Launched

Saturday July 2, 2011 marked the official launching of Green Health Seychelles - a new and innovative programme of Nature Seychelles. Attended by a cross section of Seychellois, residents, members and friends of Nature Seychelles, the launch, held at the Sanctuary at Roche Caiman, introduced to the public the green health concept that uses the benefits derived from nature to improve health.

The programme was started as a pivot for making nature conservation relevant to people. It is designed to combine a diverse range of activities like yoga and fitness in natural surroundings. Activities are carried out in a purposely built centre at the Sanctuary at Roche Caiman and the Heritage Garden, started to promote and preserve local food and medicinal plants.

"Although having had major success absorbing young people and teachers in conservation action, Nature Seychelles had difficulties in getting adults consistently involved," says Nature Seychelles Chief Executive, Nirmal Shah. "A survey we undertook showed that despite valuing the environment, people were too preoccupied with other matters especially handling stress and dealing with daily issues. We have therefore combined yoga and exercise with promotion of natural values to tackle these issues."

Research has shown that nature can have huge positive benefits for people. Exercising in nature it has been shown, can increase self esteem, decrease levels of anxiety and reduce tension. "Nature and outdoor activities are increasingly being used, and evaluated, as therapy for a variety of illness and malaise," a paper in the Journal Environment, Science and Technology published in 2010 says.

Seychelles has health problems typical of developed countries like high blood pressure, a high prevalence of diabetes and obesity. The programme aims to make valuable contributions to the well being of Seychelles society. An important aspect of the programme, will be working among the vulnerable in society, particularly the youth.

The launch was marked with activities that included yoga sessions for adults and children conducted by Robin Hanson, the programme coordinator. Robin taught guests simple stretches and body exercises that can easily be done even while seated in an office. The children enjoyed wildlife themed exercises - they leaped like frogs, stood like herons and stretched like snakes. This provided physical exercise and learning about Seychelles wildlife.

Guests were enthusiastic about the programme and many expressed their desire to exercise more. And they agreed there is no better way to do it than with nature.

"We are offering people the opportunity to explore and develop physical strength, aerobic fitness, mental and emotional life, and diet," says Robin. "But at the same time we are involving them in conservation work. The response since the programme started has been very encouraging and we are looking forward to more people joining us."

Photo: Exercising in nature has huge health benefits

The Natural Solution to Society's Problems

Children love being outdoors. Playing is great and is a chance to explore outside of the boundaries of the home. Not only is it fun for the kids, it's good for them too. Scientists have discovered that children function better cognitively and emotionally in 'green environments', that is places with nature vegetation, than those without. No wonder that a study of urban children discovered that 96% of them illustrated outdoor places when asked to make a map or drawing of their favourite place.

Conversely, a lack of routine contact with nature can be detrimental to children's health and may result in stunted academic and developmental growth. This condition has been termed Nature Deficit Disorder by author Richard Louv in his book *Last Child in the Woods*. Louv says we have entered a new era of city- centred life that restricts outdoor play, in conjunction with a plugged-in culture that draws kids indoors. But, Louv argues that, the agrarian, nature-oriented existence hard-wired into human brains isn't quite ready for the overstimulating environment we've carved out for ourselves. Some children adapt, but those who don't develop symptoms including attention problems, obesity, anxiety, and depression.

Nature Seychelles' Sanctuary at Roche Caiman is a great local green space which we use to tackle this problem head-on. Many children have visited and enjoyed the benefits of being outdoors. The most recent was a group of twenty-five children from the President's Village who were brought by local company Applebys Corporate Service Limited to enjoy a taste of nature.

The children were taken on a tour of the Sanctuary by Martin Varley, Community and Stakeholder Action Co-ordinator, where they had a chance to watch wildlife at first hand and also take part in some fun games with strong environmental messages. They were also taken round the adjacent Heritage Garden which showcases a diverse range of traditionally grown Seychelles fruit, vegetables and medicinal herbs.

The experience on the Sanctuary formed the basis of the second part of the visit which was led by Green Health Co-ordinator Robin Hanson, who used the animals on the reserve as a platform for a special natural exercise class for the children, another form of recreation with proven health and wellbeing benefits. The weather stayed kind and at the end of the morning the children were buzzing with excitement about their visit.

We may not be able to prevent our children from suffering the impacts of our changing society, but it's good to know that the remedy is close at hand.

Photos: Children from the President's Village enjoy a taste of nature

Investing in Urban Green Spaces

The Sanctuary at Roche Caiman is an important green space used for recreation and education by locals and visitors alike. Its location and proximity to Victoria makes it easy to visit. Visitors are attracted to this green space by its modern infrastructure that includes a recently paved road, an activity centre, a board walk, the wildlife that call it home and by recent green health activities.

Urban sites like these are important, but they require constant attention to keep them at their most favourable for wildlife and visitors. For this reason Nature Seychelles has been carrying out extensive rehabilitation work at the wetland and has injected a considerable amount of funds to clear ditches and channels, deepen pools and widen scrapes.

Robin Hanson, the wetland manager explains: "We are enhancing existing features and creating new ones to make them better for the wildlife. During the drought earlier in the year, water levels became quite low affecting fish and the birds that feed on them such as herons. Ironically, during the rains we were completely flooded for a few days as the wetland filled up quickly. So part of the work we are undertook is deepening pools to hold water for longer so that in very bad drought conditions the wildlife can still have a habitat. We are also maintaining and clearing ditches to safeguard the reserve from flooding during heavy rains."

Robin also explains that an appropriate mix of plant life has to be maintained either by removing invasive plants that outgrow native ones or planting new native trees. The site has three species of native mangroves. We want to create ideal conditions for the mangroves, which is why we have applied for a grant from Mangroves for the Future," says Robin.

This is not the first time Nature Seychelles has invested in this green space. When it took over management of the site it was in bad shape. A long search for funding was conducted to rehabilitate the wetland. Major work was undertaken which removed the Casuarina trees and Typha reeds that clogged the marsh, edged out native mangroves and chocked the wetland system. Areas of open water were cleared to tempt back wading and migratory birds. And a boardwalk and bird observatory made of recycled materials was installed. Interpretive signage that told the history of the site and described the wildlife was also put in.

"Although it requires a lot of effort and money, we are determined to maintain this green space for use by the public," says Nature Seychelles Chief Executive Nirmal Shah.

Photos: Extensive work is put in to keep the wetland in shape

Marines Storm the Mud at Roche Caiman

On a very rainy Sunday the 30th October, 16 members of HMS Somerset Ship's Company, including the Royal Marines, spent time at the Sanctuary at Roche Caiman volunteering. HMS Somerset is a British Royal Naval ship conducting maritime security operations in the Indian Ocean region.

But no sooner had they arrived than they were under the deluge that covered Mahe all day on this Sunday.

At first things went swimmingly, pardon the pun, and Robin who was coordinating the volunteer activities was busy directing work to be done.

He had asked one group to clear tree branches and creepers that overhang the fence that encircles the reserve. Another group was knee-deep in water collecting bunches of previously cut typha, the invasive and troublesome reed we have to keep under control. It is cut off at the base using a brush cutter but has to be removed; when left in the water, it rots and makes the water too nutrient-rich for the wildlife. Another group had been sent off to cut a tree at the end of the reserve. All was well and the volunteers got down to work.

Then the rain began and persisted throughout the three hours they were on site. Admirably, none of the volunteers shied off from the rain and the mud. They kept working, ferrying logs from one end of the reserve to the other and carrying off the typha to be used to make compost off the reserve. "They were so enthusiastic, hardworking, focused but also managed to make the day a really good laugh," Robin said.

It was their first time in Seychelles and the first time they had been involved in this kind of work, the team leader said. "Nature Seychelles was indeed honoured to have this dedicated group from the HMS Somerset working on the wetland," said Kerstin Henri, Nature Seychelles' Director for Strategic Operations.

Photos: HMS Sommerset staff work on wetland.

Why do birds wear rings?

Bird Ringing Training for Cousin Wardens

From 18-23 September 2011, a bird ringing training course was organized for Cousin wardens. It was conducted by Dieter Oschadleus from the South African Bird Ringing Unit - SAFRING. The training was mostly on mist-netting of seabirds and land birds, a method used in bird ringing. A total of 478 birds were caught and ringed including recaptures. The Lesser noddy was the most ringed species during the course while the Seychelles fody was the second most ringed species.

All participants were awarded certificates at the end of the course. Ringing and releasing birds is delicate work and ringers need skill and experience thus the training.

But why ring birds?

There are different reasons for ringing birds. One of them is to be able to identify birds individually in a population, usually using a combination of different coloured rings. This is what is done on Cousin with the magpie robin and the warbler, where every single bird of these species is colour-ringed.

Ringing involves putting a metal ring with a unique ID on the legs of a bird. Colour rings are used in a unique combination, which helps identify each bird. For the magpie robin, one colour ring is attached to the right leg to identify the island - Cousin uses a red ring.

Additionally, for the magpie robin two colour rings are attached to the left leg to identify the bird. With this system, the whole family tree of a bird can be determined.

Bird ringing can also help answer a number of questions relating to a population's movement, dynamics and behaviour. The ring allows, when the bird is recaptured or found, for information on its movement, longevity and social associations to be retrieved.

During the bird ringing course, a Seychelles fody ringed in 2002 on Cousin was recaptured, showing the bird lives for at least 9 years. Information on the longevity of the Seychelles fody had never been published before.

Not all birds are ringed however. On Cousin, the land birds that wear rings are Seychelles magpie robins (ringed by Nature Seychelles staff) and Seychelles warblers (ringed by the Seychelles Warbler Research Group). Seychelles fodies were ringed by a PhD student conducting her research. Some species of seabirds are also ringed; for example the White-tailed tropicbird and the Lesser noddy are ringed during the study of their breeding success thus parents and their chicks are ringed when they are on the nest.

The rings are very light, and are designed to have no adverse effect on the birds. They are normally supplied by a ringing authority, which also maintains data on them. In our region, SAFRING administers bird ringing and supplies rings, ringing equipment and other services that include training ringers.

Photos: Top - Wardens learn how to ring birds (Dieter Oschadleus)
Below - Lesser noddies were the most ringed species during the course (Peter Chadwick)

Seychelles Magpie Robin: The Only Way is Up

The Seychelles Mapgie robin population in Seychelles now stands at a minimum of 234 birds at the end of October 2011, which is a considerable improvement from the last population estimate of 210 in April 2011.

This increase is due mostly to a better knowledge of the populations on Frégate where a full census was carried out in June and regular monitoring conducted since August, and Denis, where a census was carried out in October 2011. The total population could be even more than the 234 given as there are a number of birds that could not be individually identified on Frégate during the survey and thus were not included in the population.

So far the islands that hold the magpie robin have:

Aride	25 birds
Cousin	41
Cousine	29
Denis	35
Frégate	106 (minimum population)

The Seychelles Magpie robin was historically recorded on at least seven islands, but between the 1950s and 1980s, the whole world population was restricted to Frégate Island and at times came very close to extinction, as low as 12 birds.

Recovery efforts which included translocation to the other four islands saw its population and range improve. It's now been down listed to "Endangered".

The Seychelles Magpie Recovery Team (SMART) made up of managers and conservation officers from the islands as well as the Department of Environment harmonises current conservation and management of the magpie. SMART, which is coordinated by Nature Seychelles, holds meetings twice a year to report on populations, and review and plan conservation efforts.

SMART also maintains the Seychelles Magpie robin database, and acts as a focal point for the collation of blood samples for molecular sexing and for trouble shooting.

Photo: Cousin Island has a total of 41 Seychelles Magpie Robins (Martin Harvey)

Seychelles – A Great Place to be a Turtle!

The Seychelles archipelago provides key nesting and feeding areas for hawksbill turtles. It is home to the largest remaining population of hawksbill in the Western Indian Ocean. This population, sea turtle experts have said recently, is one of twelve healthiest sea turtle populations globally.

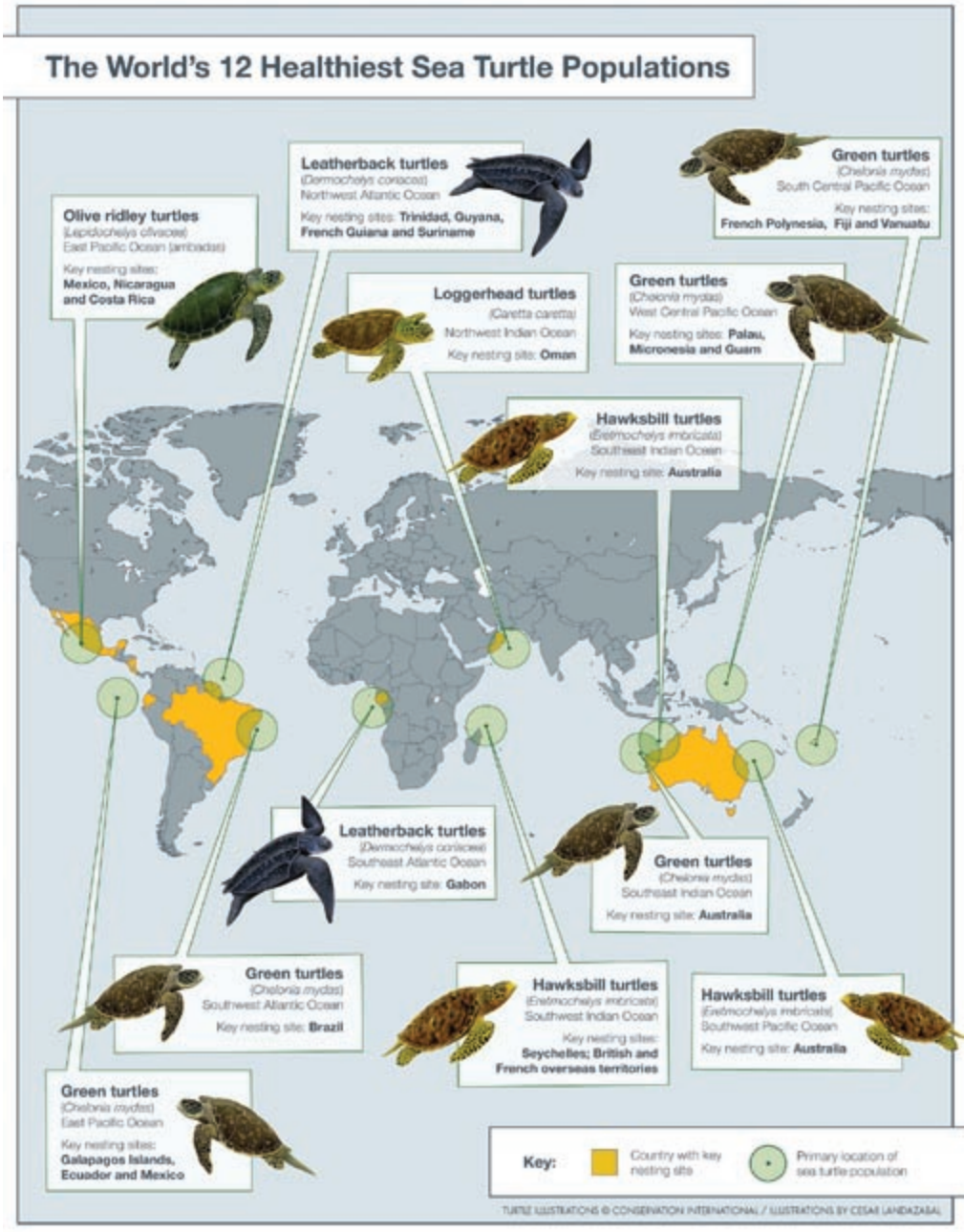
A report produced by IUCN (International Union for Conservation of Nature) Marine Turtle Specialist Group (MTSG) reveals the most threatened and most healthiest of all sea turtles (there are 7 species) populations globally. It is the first comprehensive status assessment of all sea turtle populations.

It shows that the hawksbill turtle populations in the Southwestern Indian Ocean (Seychelles, British and French Overseas Territories) and in Southeast Indian Ocean and Southwest Pacific Ocean (Australia) are the healthiest. But Hawksbill are in danger in the East Pacific Ocean, East Atlantic Ocean, Northeastern Indian Ocean, and West Pacific Ocean.

The report says that the most significant threats to sea turtles are fisheries bycatch, accidental catches of sea turtles by fishermen targeting other species, and the direct harvest of turtles or their eggs for food or turtle shell for commercial use.

Hawksbill turtles were heavily exploited for many years in Seychelles, mainly for their shell. In 1994 a law that granted them complete protection was passed and harvesting was completely banned.

Turtle conservation is carried out on many islands. One of conservation's success stories for the hawksbill turtle has been registered on Cousin Island, where a long-term monitoring programme started in 1972 is firmly established.



Photos: Top - Turtle in Cousin waters (Alec Taylor)

Bottom - Map of world's healthiest turtle populations (IUCN)

“I Took Them to a Living Laboratory”

There was a scream from behind me and I turned round to see the long legs of a teenage student in sparkly shoes and holding a mobile phone jumping from the path into the undergrowth. ‘I can’t stand lizards!’, she called out to me. ‘If you are afraid of skinks you will be doing a lot of jumping on our walk round Cousin,’ I replied.

She was one of a group of students from the University of the Seychelles who were on an educational visit to the island as part of their course. A long snake of almost 30 students tailed away behind me as we weaved our way between pisonia trees and craned our necks to look for nesting white-tailed tropic birds.

The University in one of two groups which visited the island in the same month, the other being students from the Seychelles Tourism Academy. They want to see a prime example of Seychelles biodiversity and understand the value of good management of that resource.

The choice of a visit to Cousin is an easy one as it amply fulfils both requirements. Despite its reputation, few had been to Cousin before and fewer still fully understood what role Cousin Island plays in sustaining the economy of the Seychelles.

‘What is the point of Cousin?’ I asked in my introductory talk to the tourism students. After a moment of blank faces, a couple of people pitched in about protecting the animals or as a place for nature, but most of them were surprised when I started explaining the crucial role of visitors to the island and how it is the money they pay for a guided tour which pays for the management of the island and help support local tour operators and service providers.

That wildlife could actually pay seemed to surprise both groups of students. But that was not the only amazing thing for them on the tour. The proximity of animals was a revelation. **‘I have never been this close to a bird before,’** said one girl from the University, photographing a fairy tern perched on a branch. When we called the magpie robins down from the trees tempted by the insects squirming in the uncovered earth beneath our feet, it was magic to them.

No matter how many times you visit Cousin there is always something new to see. There is a thrill to seeing animals in the wild and it is great to witness the excitement of young people coming to Cousin. But what is less encouraging is the seeming lack of knowledge or understanding of these native animals by the local people themselves. Of the 60 students who took part in the visits only a handful could confidently name the wildlife around them. Even in a small country like Seychelles the distances between its habitants and the lands in which they live in can still be very large.

Despite the awe of the visit, for many it was not a sufficient immersion into nature to commit to working on Cousin and seeing this every day.

By Martin Varley

Photo: University of Seychelles students on a tour of Cousin Island

A Day in the Life of a Reef Rescuer

Bobbing on their dingy on a rough sea is where I found the "reef rescuers" working on a Wednesday morning. They were just off Cousin Island Special Reserve, almost hidden from sight by tour boats bringing visitors to the island. The North West monsoon had made the sea choppy but they are very calm. How do they do it? I wondered to myself.

The reef rescuers are a team of Nature Seychelles staff working with local and international volunteers on the ground-breaking coral reef restoration project Nature Seychelles is undertaking in Seychelles. With financial support from USAID - the United States Agency for International Development, the NGO is attempting the first large scale reef restoration to be ever undertaken.

Corals in the Seychelles and the region were destroyed by bleaching caused by warming oceans. The most severe bleaching occurred in 1998 but they have been other subsequent bleaching events that have caused more damage.

Nature Seychelles is using the "reef gardening" method, to restore reefs on two sites around Praslin and Cousin Island Special Reserve. Using this method, healthy corals are collected from donor sites, raised in underwater nurseries to required size and then 'planted' in degraded sites.

Earlier when I met David, who is the project's manager, he had told me they were headed to a coral collection site off Cousin. Here they would dive in shallow water, about 6-8 metres, to collect about 2000 fragments of corals, the target for the day. They had identified the site through dive surveys they carried out beforehand, which also helped them identify coral species they can use. They gathered, where possible, naturally-broken fragments that have low chance of survival and harvested no more than ten percent from healthy colonies to allow healing and regeneration.

Back on the dingy, the reef rescuers, David, Gideon, Rodney, Katie, Hannah and Nick are breaking up the coral fragments into tiny pieces, which they tell me are called "nubbins." They then tie the nubbins onto a rope.

It seems to me that sturdy sea legs and nimble fingers are needed for the job. But they say that anyone can fix nubbins to rope. They do however have an interest in the marine environment in common and are expert divers. One of the project's objectives is to transfer skills and to build expertise to scale up restoration on other sites in Seychelles. One of the local partnerships that has been established is with Octopus Dive Centre. Its manager, Helene, is part of this team but is not on the boat when I visit.

When the rope is full of nubbins, one diver will go down and fit it onto a nursery frame that has already been prepared near Cousin Island. Two types of nurseries, the rope and the net nurseries, are being employed for the project. The rope nursery is being tested for now and the first nursery was filled with about 5,000 fragments in early November and lowered into the sea.

The nubbins will be left in the nursery to grow with a bit of maintenance and monitoring. I asked Katie to sum up her day. "Long hours on a boat and with a bit of heavy lifting. But it's all good," she said.

By Liz Mwambui

Photos: Reef rescuers at work off Cousin Island Special Reserve

7th WIOMSA Symposium: A Region of Marine Science

The 7th Western Indian Ocean Marine Science Association - WIOMSA Scientific Symposium was held in Mombasa in October 2011. From humble beginnings, with around 30 participants making presentations over two days in 1997 during the first symposium, this year's saw a staggering 215 oral and 242 poster presentations being delivered. The association has successfully organised six other Scientific Symposia in the region which have quickly become the premier marine scientific gathering.

Addressing dignitaries and participants during the opening of the symposium, Dr. Nirmal Shah, President of WIOMSA put this achievement in perspective. **"It has taken a long time for our sub-region to be able to showcase its own marine science capability. And the WIOMSA Scientific Symposium has been the only continuous and regular regional platform for presentation, discussion, partnering and even discovery,"** he said.

"When I am asked to describe WIOMSA's achievements in one sentence I simply say this: **WIOMSA has built a region of marine science.** By this I mean that while marine science has been going on in our countries before WIOMSA, it was pre-eminently WIOMSA that systematically and strategically facilitated, and sometimes even pushed, scientists to collaborate across institutions, countries and disciplines."

This Symposium proved to be the most popular yet, with nearly 500 delegates. Presentations were made by regional and international scientists and practitioners as well as a host of students, many of whom were able to attend the conference through benefitting from partial grants from WIOMSA. 10 Special sessions focusing on diverse subjects ranging from population health in the coastal zone, endangered marine mammals, seabirds, tuna fisheries, to mangrove habitats were also organised.

This is testament to the importance that regional and international scientists, managers and decision-makers place on the gathering. In addition to the scientific programme, many see this as a great opportunity to interact at a variety of levels with their colleagues and peers from the region.

The guiding theme of this year's Symposium was "Coping With Global Change". This was intended to reflect the urgent need to address changes and threats to the fragile ecosystems of our planet at a variety of levels, and embrace a call for action based on good scientific evidence.

As usual, this WIOMSA Symposium welcomed the participation of a very broad range of disciplines, and it is expected that these will indeed make a significant contribution to that body of good scientific evidence that is needed to support strategies and actions to address change, both in the region and globally.

WIOMSA is a regional organization that promotes the educational, scientific and technological development of all aspects of marine sciences in the Western Indian Ocean (Somalia, Kenya, Tanzania, Mozambique, South Africa, Comoros, Madagascar, Seychelles, Mauritius, Reunion (France).

Photos: WIOMSA symposia are the premier marine scientific gathering in the region. Inset: WIOMSA President Nirmal Shah addresses the gathering

Seychelles Science Shines at WIOMSA Symposium

As Seychelles develops a knowledge-based society, recent exciting activities proved that science and technology are advancing rapidly in this small country. The growing contribution of Seychelles to marine science and conservation was highlighted during the 7th WIOMSA symposium by nine Seychellois and Seychelles-based scientists who made presentations.

Lead authors of these presentations are based at the Seychelles Fishing Authority (SFA), Nature Seychelles and the Island Conservation Society (ICS).

Karen Chong-Seng is a Seychellois PhD student enrolled at the James Cook University (Australia). Her studies, based in Seychelles and supported by the SFA, aim at understanding the ecological processes that are important for the recovery of coral reefs. Ms Chong-Seng's research findings will have implications on how human impacts on reefs are managed, including the fisheries for algae-eating fish that play an important role in reef recovery.

Jude Bijoux, also a PhD student based at SFA, has been analysing the time rabbit fish spend at sites where they spawn, whether they are faithful to particular sites, and the distances and routes the fish travel to reach there. The work has been very useful in the establishment of co-management of small scale fisheries on Praslin between Praslin fishermen themselves and the SFA (see Feature article on page 26).

Gregory Berke presented on SEYSHA, a collaborative project between of SFA, IRD, Marine Conservation Society Seychelles and the South African Institute of Aquatic Biodiversity (see Feature article on page 24). This project is studying the spatial behaviour of reef sharks around the inner islands of Seychelles, for which acoustic transmitters are used to track their movements and residency at inshore reefs. This work addresses an important gap in the knowledge of sharks.

Calvin Gerry, who is a physical oceanographer working for the SFA, delivered a presentation on computer-based models of how rabbit fish larvae disperse from spawning aggregation sites on Praslin. Similar to Bijoux's work, this study is supporting the establishment of co-management for small-scale fisheries on Praslin.

More senior scientists who have been working for many years in the field made some key presentations.

Jan Robinson from the SFA delivered a presentation on spiny lobster stock assessment. This study will provide estimates of optimal harvest rates that, if introduced, would enable the fishery to be open for more consecutive seasons than is currently allowed. It is now recognised that elimination of illegal fishing in closed seasons and years would allow either more licences to be given or an extension of the open season to more than three months – an important finding for Seychelles fishermen.

Riaz Aumeeruddy of Nature Seychelles presented information from a pilot study that is looking at the impacts of climate change on hawksbill turtles. Turtle eggs are sensitive to minor changes in nest temperature that can change the sex ratio of hatchlings.

Aumeeruddy also made a presentation on a recently launched project to identify and demarcate Marine Important Bird Areas (MIBAs) in Seychelles. This is being seen as a new tool to protect important areas of the ocean that are important for seabirds which themselves are indicators of the health of the ocean.

Nirmal Shah of Nature Seychelles and President of WIOMSA presented an overview of the coral reef restoration work that is being conducted at the Cousin Island special reserve and other reefs on Praslin.

Aurélie Duhec from the ICS delivered a presentation on Black-naped Tern breeding colonies in the St François Atoll. This uncommon and understudied seabird is of high ornithological interest since studies have now identified two small nesting sites and revealed two nesting

Photos: Top - Riaz Aumeeruddy presented information on a pilot study on the impacts of climate change on hawksbill turtles. Above - Karen Chong-Seng receives her award for best oral presentation.

periods per year.

Interestingly, a single Roseate Tern has constantly been observed within the breeding colony during four consecutive years and research is continuing into suspected hybridisation between the two species.

Other foreign scientists working in Seychelles also made presentations. Haruko Koike, a PhD student based at the SFA and the University of Hawaii, presented preliminary results from her studies on the sea cucumber fishery of Seychelles.

This research is looking at whether there is a natural refuge for commercial sea cucumber occurring in areas too deep for divers to operate. This is being conducted using an unmanned submarine vehicle that can descend to depths greater than 40 metres and video sea cucumbers. The study will also address the benefits of marine protected areas (MPAs) for sea cucumbers and the role of habitat in their distribution and abundance.

As well as these first-author presentations, many Seychellois and Seychelles-based scientists also featured on more than 10 other presentations as co-authors, reflecting the broad collaboration and involvement in regional projects that are advancing science in Seychelles and elsewhere.

Karen Chong-Seng and Jude Bijoux were given awards for best oral presentations a reflection of the quality of their work and the professionalism of their presentations.

"The high level of exposure for Seychelles science at the WIOMSA symposium should serve as a benchmark for further progress in the years to come. It can provide an inspiration for young Seychellois interested in science," said Nirmal Shah.

Jan Robinson added: "With the establishment of the University of Seychelles, it is expected that future generations will provide a steady source of scientists to continue working on knowledge-based solutions to the many issues that Seychelles faces."

By Jan Robinson, originally appeared in the Seychelles Nation on 21.11.2011

Durban Climate Change Conference:
Making a map but forgetting the territory

The World's deal makers at the Durban UN climate talks gave up on the urgency to stop global temperatures rising more than 2 degrees Celsius.

COP 17 - the United Nations Climate Change Conference in Durban, South Africa, ended with a so called roadmap which would agree on a treaty in 2015 and for implementation to start in 2020. For many this was just another attempt to delay decisions on what must be the most urgent danger facing the world.

The main challenge of the Durban talks was to find a deal acceptable to develop and developing countries on the future of the Kyoto protocol which expires at the end of 2012. In the end the developing countries, including the AOSIS grouping of Small Island Developing States (SIDS), agreed to establish the Durban Platform for Enhanced Action which would negotiate a new global agreement by 2015.

The Birdlife International Partnership (Nature Seychelles is Birdlife in Seychelles) was not very optimistic. "Although a step in the right direction, the bottom line is that there remains a profound mismatch between the level of action demanded by our best scientific knowledge and the current level of ambition of the world's governments…", Melanie Heath, Birdlife's Head of Policy, explained. "We are currently on a path towards 3°C to 5°C of climate change in this century, with likely disastrous consequences…".

Developing countries have been bullied and forced into accepting an agreement that could be a suicide pill for the world," says Ninmmo Bassey of Friends of the Earth International. The mood was further marred by Canada announcing that it would withdraw from the Kyoto protocol.

For Seychelles, other SIDS and neighboring countries of the Western Indian Ocean region, there are two important issues. One is the launch of the Green Climate Fund which is intended to channel money to help developing countries, and secondly the discussion on ways and means to facilitate technology transfer, particularly in relation to the obstacles imposed by intellectual property rights.

But the only clarity on the Fund was the agreement that it would be overseen by a body under the UN as requested by developing countries, rather than the Global Environment Facility (GEF), which the European Union and United States wanted. "The deal has totally failed Africa," says Harjeet Singh, of the leading NGO, ActionAid. In fact, there is no money on the table for Africa and for SIDS to start acting on climate change. "The Green Climate Fund is like an empty shell" concludes Singh.

Even the African Development Bank is skeptical about the funding. The Bank has said that up to now Africa has benefitted from only 12 percent of global climate change funding, with most of it going to North Africa.

It was also agreed to set up a Climate Technology Centre and Network to facilitate technology transfer between developed and developing countries. Now the search is on for a host for the Centre. But the Durban Platform does not address Intellectual Property Rights or IPR. Many are saying that patent restrictions will be the major barrier to the free flow of appropriate climate-friendly technologies to the developing countries that need them the most. At the end of the day the Centre may become simply be used by big businesses in the developed world to flog their technologies.

By Nirmal Shah

Photo: Climate protest (Tapiwa Gomo)

Research Before you Conserve: **The Seychelles Warbler as a Case Study for Saving Species**

By Martijn Hammers, Sjouke A. Kingma, and David S. Richardson

In 1968 there were only 26 surviving Seychelles warblers on Cousin Island before the island was purchased for conservation. Sound management and habitat restoration has allowed the population on Cousin to increase to a carrying capacity of about 350 birds. However, because the warblers were unable to fly well enough to disperse and establish new populations elsewhere, the population remained restricted to Cousin. Worryingly, species that occur in a limited number of small isolated populations are very vulnerable to extinction, both because of the negative effects of inbreeding and because even a single detrimental event like a disease outbreak or hurricane could potentially wipe out the entire world population.

Therefore, since 1988, extensive efforts have been undertaken to establish new populations of warblers on other islands. Moving individuals to new areas allows both the population size and the number of populations to increase. These efforts have now resulted in the successful establishment of four new populations of Seychelles warblers, thus making this a shining example of what translocations can achieve.

An important ingredient in the success of the warbler translocation program has been the biological understanding of the species, provided by the long-term research program that has been undertaken by the Seychelles Warbler Research Group since 1985. This and a clear understanding of the key factors influencing translocations are critical before translocations can take place.

Features of the source population

It is essential that the source population can recover after the removal of individuals. This has been shown to occur very quickly in the warbler. Although warblers lay only one egg per clutch and reproduce slowly, the removal of individuals leads to a rapid increase in the number of offspring successfully produced by the remaining birds. This is largely because competition for food is reduced on the island. For instance, in May 2004, 58 of the approximately 350 individuals (17%) on Cousin were translocated to Denis. However, within a

year the population had risen back to a level higher than that prior to the translocation (371 warblers)! Another mechanism that allows the warbler to be so resilient is that there is a surplus of adults who do not have their own territory. These individuals often remain with their parents and help raise their offspring (cooperative breeding). When territory holding individuals are removed from the population, the vacancies created are quickly filled by such surplus individuals; almost 80% of the breeding vacancies created during the Denis translocation were filled by surplus birds shortly after the translocation.

The new island

The new location must be suitable for the species translocated. This may sound obvious, but to be able to assess this, detailed information about the dietary, habitat, and nesting requirements of the species is needed. Using detailed observations on where and how birds forage and where they nest, Aride and Cousine were found to have similar (or better!) conditions compared to Cousin and so were considered suitable for the warblers. Indeed, both the Aride (1988) and Cousine (1990) populations showed rapid population increases after translocation. For example, between 1988 and 1997, the Aride population increased from 29 to 1600 individuals. On Denis Island (2004), the weight (condition) of birds improved after translocation, reflecting the reduced competition for food on that island compared to Cousin. The Denis population also increased after introduction, but the growth rate was slower than after previous translocations. This was found to be caused by the negative effect of an introduced predator, the common mynah. Fortunately, post-translocation monitoring of the population on Denis meant that this problem was quickly identified and action was taken. This shows the importance of considering how the predators and diseases present in the new location may also affect the translocated species, plus how the species fits into the ecosystem that is already there. It also illustrates that detailed monitoring of the new population is crucial.

Individual characteristics and timing

In translocations, the most important predictors of success are the number of individuals that are moved, and the characteristics of these individuals. To ensure the long-term success of the newly established populations it is important to move as many unrelated and genetically diverse individuals as possible. Our research has shown that warblers with low genetic diversity have lower annual survival. Previous translocations showed that also breeding experience is an important factor. Warblers with helping or breeding experience produced significantly more fledglings compared to young or inexperienced warblers. In addition, the timing of a translocation is very important. For warblers, the best timing for a translocation is a few months after the breeding season when the birds are not caring for young anymore. At this point the birds are at the heaviest and in the best possible body condition.

The above examples show how biological understanding helps guarantee the success of translocations. In the Seychelles, translocations have been successfully carried out for several island populations of endemic bird species. The knowledge gained through monitoring and research undertaken on these species is now extremely important in informing the conservation of rare species both in the Seychelles and throughout the world.

David S. Richardson (University of East Anglia), Martijn Hammers and Sjouke A. Kingma (Groningen University) are part of the Seychelles Warbler Research Group.

Photos: Facing page - Seychelles warbler on Cousin (Martijn Hammers) This page - Warbler release on Fregate Island Private (Paul Nixon)

Hard Times in Paradise?

Measuring Stress in the Seychelles' Warbler as a Tool for Conservation

By Janske van de Crommenacker

During the past few years I have been studying the phenomenon of oxidative stress in the warblers on Cousin. Oxidative stress is a type of stress that is related with the toxicity of oxygen. You can measure it by analyzing a little drop of blood. In contrast to what most people think, oxygen is not only beneficial for organisms. All organisms that breathe oxygen face the hazard that it can become toxic in certain circumstances. When an organisms' metabolism is elevated, for example when it's physical workload is higher or when it has to fight a disease, it's body consumes more oxygen and produces oxygen by-products at a higher rate. These toxic oxidants can cause so-called oxidative damage to cells and tissues, which is in turn believed to play a key role in aging and the onset of degenerative diseases. To defend itself from these harmful oxidant attacks, the body uses antioxidant defences that are gathered both from the food and from internal production. These antioxidants can neutralize the oxidants so that the damage is limited. It is crucial to keep a good balance between the oxidants and the antioxidants!

I examined which factors in the environment cause this type of stress in Seychelles warblers and what are its consequences. My dissertation is titled 'Hard times in paradise?', because most people find it hard to believe that a small bird living on Cousin Special Reserve might be suffering from any stress at all. Cousin is not only a paradise for people, the reserve must be a paradise for the birds too.

The well-protected island, free of human disturbance and natural predators (for adult warblers) is a safe haven compared to most places where animals are prone to many dangers and stressors. This is one of the reasons why my supervisors (Jan Komdeur and David Richardson) and I chose to conduct our study on this population.

We wanted to investigate natural influences in a free-living species that is not disturbed by humans. Very little is still known about how natural environmental variables are associated with oxidative stress in wild-living animals, and how oxidative stress influences the individual's well-being (like it's survival and reproduction, also defined as their fitness). Also, as the Seychelles warbler population on Cousin has been studied for over 25 years, we can identify every individual (by their unique combination of colour-rings) and thus know a lot about their age, family links and social status. Many important questions in ecology and evolutionary biology can only be answered with data that extend over several generations and that include records of individuals over their life. Apart from the fact that so much is known about them, they are also very long-lived and they do not migrate on or off the island. The population on Cousin thus provides a closed study system that allows researchers to follow the same individuals from birth to death.

Even on a tranquil place like Cousin, I found that birds do experience oxidative stress depending on the circumstances. For example, seasonal changes in prevailing wind direction cause salt spray from the sea to be blown inland. This causes dramatic defoliation of trees and reduces insect availability in exposed areas. I found that birds in these poor food circumstances had higher levels of oxidative stress. Possibly, the food scarcity increases the foraging effort of the birds. This extra workload elevates their metabolism and thereby the production of toxic oxidants. I also found that parasitic infection can elevate oxidative stress levels. In the Seychelles warbler population on Cousin, 40% of individuals have been found to be infected with avian malaria. Fortunately, this malarial infection does not have any negative consequences for their reproductive success or adult survival. Yet, I found that malarial infection is linked with higher oxidative stress, but this depends on breeding stage of the birds. Only during the provisioning stage, in which the parents have to invest a lot of extra energy in the feeding of their chicks (flying continuously on and off the nest), did infected birds have higher oxidative stress than non-infected birds. Apparently, the infection itself does not increase oxidative stress, but an elevation does occur when infected birds are dealing with a higher workload. Another interesting finding was that reproducing females have elevated antioxidant defences in the weeks just prior to egg-laying. As soon as the egg is laid the antioxidant levels drop again. It could well be that the warbler mothers-to-be deposit a load of antioxidants into their eggs as a strategy to enhance the health of their offspring!

Although there is a number of factors that can elevate the birds' stress levels, I found no clear evidence that higher oxidative stress had negative consequences for their reproductive success or their survival to the next year. However, although it seems that increased oxidative stress has no direct short-term negative consequences, it will be good to continue the investigation to verify whether oxidative damage accumulated throughout life has an effect on the birds' life span.

My study can be used as a tool to assess the quality of the environment and circumstances they live in. For example, measurement of oxidative stress levels can be used to verify how well the birds are doing in their new environment on Frégate Island. This way, conservation and science can go hand in hand in hand to ensure the well-being of this species.

Janske van de Crommenacker is a biologist from the Netherlands and is part of the Seychelles Warbler Research Group

"Each warbler has its own story, and each time I return to Cousin a new chapter of their individual stories can be written! A little list with the leaders in the field is given here..."

Description	Ring number	Colour code	Territory	Remarks
Most beautiful warbler	R737864	RERX	51.2, later 103.1	Leucistic or not, she's just beautiful with this light-coloured plumage
Most cosy warbler	R737672	NELX	93	Always sings a nice song for you (Nellie)
Most immoral warbler	K278267	YROX	51.1	Oldie, born in 1996 and 'did it' for years with his granddaughter NNMX
Most immortal warbler	J368318	OOAX	48	Oldest warbler alive on Cousin, rung as subadult by Jan K. himself in 1993
Most persistent warbler	R737869	WWMX	92	Born in terr. 17 near the research house and flew as subadult to territory 92 on the other side of Cousin. There she gained a breeding position, but the first nesting attempt failed. In the next season we found her back in one of the neighbouring territories in a crappy state and apparently chased away by another female. But... WWMX fought back and next year she regained her spot and mate. There she successfully raised chicks ever since.
Most annoying warbler	V267190	OOWX	92	She was the nasty lady in the story of WWMX. Besides, it took 5 afternoons to catch her
Most brave warbler	R737606	BXLY	92.1	Flew from Cousine to Cousin; a female of course
Most nervous warbler	P361990	YWMX	33	Man, this guy knows how to guard a nest!
Most predictable warbler[1]	K278047	GGeX	48	Builds her nest always in the same little tree next to the trail but will fail at all times. After two attempts she will try the tall *Pisonia* on the opposite side of the trail.
Most fertile warbler	R737550	BGXZ	58	Always 2 or 3 eggs in the nest (with help of BEBX (Beppie) et al.)!
Most infertile warbler[2]	N748875	EGSX	17	All those nests, all those eggs, all this climbing… but no chicks
Most confusing warblers	N021968 and V267189	BBYX and YBBX	88	YBBX, of all 120 territories you could choose from.. why did you have to move to a territory where BBYX was already present?! Do you know how annoying this is for observers!
Most relaxed warbler	P885936	RLAX	16	What's in a name…
Most womanizing warbler	P885915	WGAX	50.1	Was simultaneously 'running' two nests with two different females
Most sticky warbler	V267393	EVVX	53	Poor young male named Sidonia, because he was caught in *Pisonia* seeds

[1]Runners up: BNBX (terr. 92.1) and NVAX (terr. 52), always nesting in the same tree.

[2]Runner up: EBMX (terr.41.1) but at least her nests are easy to reach in the low vegetation.

A Shark's Tale

Using Acoustic Telemetry to Investigate Coastal Shark Behaviour

By Gregory Berke

The Seychelles National Plan of Action for Sharks (NPOA- Shark), which came out in 2007, highlighted a fundamental lack of information on the distribution of shark stocks (which are known to be declining worldwide), their biology, and the role that they play in the ecosystem. It concluded that this lack of information is hampering the effective management of shark stocks and fishery in the Seychelles.

Stakeholders interviews concluded that there is a perception of decreasing numbers of sharks seen during dives and caught by the fishery over the past 30 years. The reduction in shark stock is of major concern as these top predators play an essential role in maintaining the health of coral reefs.

In order to fill the identified knowledge gaps the SEYSHA project was launched in 2010. Its main objective was to study the distribution and movements of coastal sharks around the inner granitic islands with the use of a novel technology known as acoustic telemetry. This relies on a number of acoustic listening stations which have been deployed around the islands which monitors the signal from sharks which have been tagged with acoustic transmitters each time that they are within detection range. This keeps a log of the sharks visits at the different stations. Studying the timing of these detections gives us a insight of the movement of different sharks within this network of listening stations.

The project is being implemented in collaboration with traditional shark fishermen who are responsible for setting long lines (locally known as drag). These lines are set in the evening and inspected for catch every morning. When species of interest are caught the Research Section of the Seychelles Fishing Authority is informed and staff are mobilized to the site for tagging.

Tagging involves putting the shark in sleep mode known as tonic immobility by rolling it on its back and the surgical implantation of an acoustic tag within the body cavity through a small incision which is then stitched closed. An external numbered plastic tag is then inserted in the animal`s back to allow for easy identification by fishermen and divers. The acoustic tags have been programmed to send a signal every 2 minutes for 2 years.

Twenty-one of the projected 30 sharks have been tagged to date. They include species such as tiger, lemon and grey reef sharks. There are also plans to expand the tagging programme to include bull and hammerhead sharks.

The project is targeting both adults and juvenile sharks. The interest with regards to adult sharks is to understand their movements around the islands and identify areas of ecological importance in terms of feeding, reproduction and migration. For juveniles the interest is to study residency time in nursery habitats such as coastal lagoons. Such information can help in the management of these critical nursery habitats.

The information provided by the project will be used with other types of information to decide if existing spatial management is effective or whether there is a need to enhance existing management measures. Furthermore the knowledge could assist in the development of policies to reduce conflicts between different stakeholders, particularly shark fishermen and dive operators.

SEYSHA is supported by the Institut de Recherche pour le Développement (IRD) through its Jeune Equipe Associé a IRD research programme whose objective is to build and support the development of local research teams in developing countries. It involves collaboration between marine scientists from 3 regional countries including Seychelles, La Reunion (France) and South Africa.

Gregory Berke is a Fisheries Technician with the Seychelles Fishing Authority

Photo: Applying an acoustic tag on reef shark (Greg Berke)

Tracking Penguins to Establish Marine Important Bird Areas in Southern Africa

By Christina Moseley and Ross Wanless

The African Penguin is listed as 'Endangered', and the global population has decreased by >80% since 1956. The 2011 census of the number of breeding birds in South Africa, which is conducted by the Department of Environmental Affairs, is once again sobering. The major colonies in the Western Cape have all experienced 20-30% decreases relative to 2010 counts.

Penguins are threatened by a myriad of sources, including predation by seals, catastrophic oil spills and a lack of food. The lack of suitable food is the threat that is thought to be the most pressing. Penguins eat mainly sardines and anchovies, which are also the target of the commercial purse-seine fishing industry. However, the role fishing has played in the decrease in penguin numbers is hotly debated. It is further complicated by a shift in distribution of the sardines and anchovies from the west coast of South Africa (where the bulk of the penguin population used to occur) to the south coast in the mid-2000s.

BirdLife South Africa has received funding from the Charl van der Merwe Trust, which is now a Species Champion for the African penguin. One of the projects that they are funding is a study by Dr. Lorien Pichegru, looking into the effects of prohibiting fishing around penguin breeding colonies and seeing how this affects the penguin breeding success and foraging movements. Preliminary results are encouraging and suggest that preventing fishing near breeding colonies helps the penguins.

Other researchers are also tracking the movement of penguins from different colonies using GPS loggers. BirdLife South Africa hopes to use these results to start off a programme to identify marine Important Bird Areas (IBA).

Marine IBAs are similar to their terrestrial counterparts, in that they aim to protect areas where either large congregations of birds occur or where threatened species occur consistently. The marine environment is, however, much more variable than the terrestrial environment so identifying IBAs is more complicated. Marine IBAs can be as simple as extending protection around seabird breeding colonies or they can define areas of open ocean which are important foraging areas. Tracking data can be very useful in showing 'hotspots' as well as 'coldspots', especially when data are from several years.

Once marine IBAs are identified these can be used to inform conservation planning. South Africa has a protected area expansion strategy that aims to increase the percentage of both terrestrial and marine protected area coverage in South Africa. In addition, the Department of Fisheries may declare Fisheries Management Areas, where certain types of fishing activities are prohibited - these are not Marine Protected Areas, but are zoned fishery areas. Marine IBAs may be declared Marine Protected Areas, Fisheries Management Areas or they may remain just marine IBAs.

Most notably, marine IBAs will serve as an advocacy tool, allowing conservationists to justify why specific areas should be protected. Identifying areas for the charismatic and relatively well studied African Penguin is a good place to start, and based on this, South Africa hopes to designate some of Africa's first marine IBAs.

Christina Moseley is African Penguin Species Champion Project Officer and Ross Wanless is Africa Coordinator, BirdLife International Global Seabird Programme, BirdLife South Africa

Photos: Top - Attaching a GPS tracker to a penguin. Bottom Penguin with a GPS tracker attached (Lorien Pichegru)

Managing the Catch

Co-management of the Praslin Near-shore Fishery

By Jude Bijoux

As fish stocks decline worldwide and biodiversity is depleted, one approach to sustainable fisheries that has gathered momentum is fisheries co-management. This comprises of a spectrum of shared responsibility between government and the users to manage fisheries resources. In Seychelles, the first ever co-management structure is being initiated through the Praslin Fisheries Co-management Coordinating Committee (PFCCC)

The PFCCC was set up in July 2011 to oversee the development and implementation of a small-scale fishery management and co-management plan. The committee has 10 members and representation from 6 different organizations including the Praslin Fishers Association (PFA), Seychelles Fishing Authority, Department of Environment, Seychelles National Parks Authority (SNPA), Cousin Island Special Reserve and Cousine Island. Of these 10 members, 5 are fishermen to ensure that the fishing community is adequately represented.

The committee is putting emphasis on the participation of the fishing community in decision making as it is this community that will implement management decisions when these are made. With this objective in mind, the committee is chaired by Mr. Darell Green, who is also the current chairperson of the PFA.

The PFCCC is already well underway with its work. In August 2011 it took the delivery of a fishery stock assessment report for the Praslin near-shore fishery, which had been commissioned 3 months earlier. The stock assessment highlighted that there was an urgent need to put in place a precautionary management plan and alternative management measures for the Praslin fishery and the need for more research dealing with various aspects of the fishery from more detailed catch composition, catchability of different gears and fishermen dynamics. This precautionary approach was deemed necessary so as to ensure that the fishery remains sustainable, particularly in view of the decline in catch per unit of effort which was observed over the last 5 years.

Plans are already well underway to set up a community based data collection program to get fishermen more involved in collection of data on their daily catch. It is hoped that this new initiative will increase the amount of fisheries data that is currently being collected and provide more detailed information upon which the status of the fished stocks could be better assessed in the future. Additionally, it will serve to increase fishers' confidence in the data. The program is planned to start field implementation in the first quarter of 2012 with a small group of interested fishermen and gradually expand.

The new year (2012) is set to be a busy time for the PFCCC with the development of the fishery management and co-management plan. This process will be steered by an international expert in fisheries management under the guidance of the PFCCC and will require several months of consultation with stakeholders involved in the fishery and the area in which fishery management will be implemented. The expected final product is a fishery management plan which is modern, based on the best available scientific information. and adaptive so that it can be easily modified to cope with new and emerging issues.

The PFCCC also has other plans for 2012. On top of its long list is the implementation of an awareness and education program on the role of the committee and the raison d'être for implementing active fisheries management around Praslin. There are plans to strengthen the institutional set-up of the PFA and put in place a monitoring, control and surveillance program which will start implementation once the fishery management plan is drafted and approved by the stakeholders and government. It is hoped that the initiative will improve collaboration between the fishing community and environmental organization such as the SNPA and Nature Seychelles managers of Cousin Island, which are operating in the defined management area and that there will be visible improvements in the management of the fishery.

The project is part of the fisheries component of the Mainstreaming Biodiversity Project financed by the Global Environmental Facility.

Jude Bijoux is undertaking PhD studies in fish spawning aggregations and is based at the Seychelles Fishing Authority.

Photo: Fish at a market (Peter Chadwick)

Fishing for Tomorrow

Community Conserved Areas at the Kenyan Coast

By Richard Lamprey and Dishon Lionel Murage

Bakari, a fisherman from Vanga on the far southern Kenyan coast, doesn't need workshops and seminars to tell him what is wrong. He knows already. These days, when he goes out in his canoe to set his gillnets, he catches next to nothing. Instead, he can make more for his family by joining a 30-man crew on a large ring net boat, though ring net fishing is under a temporary ban. He also knows that if ring net fishing is conducted within the reef, all fish stocks will eventually disappear, but what can he do?

Bakari's situation typifies the dilemma facing fishermen on the Kenyan coast. With population increasing, the pressure on marine and coastal resources is becoming intolerable.

But help is at hand. Since April 2009, Fauna and Flora International (FFI) and its partner, the East African Wildlife Society (EAWLS), have implemented a Darwin Initiative Project on the south coast to help address these issues. The project is working with communities through a marine resources co-management structure to create 'community conserved areas along the coast, which communities may, with the Department of Fisheries, co-manage for sustainable use. It is a collaboration between many players; the communities, the Department of Fisheries, technical experts on the marine environment, and the private sector.

For well over a decade, the Kenyan government has realised that the future of sustainable resource use in Kenya lies with communities who depend on those resources. This understanding is now enshrined in policy and legislation that encourages collaboration between the government and local communities in resource management, a process known as 'co-management'.

This devolves many aspects of marine resource use to communities, under co-management agreements with 'Beach Management Units', or BMUs.

The BMUs' most practical activities are to ensure that only legal fishing methods are used and that only registered fishermen in registered boats can operate in the BMUs' 'area of jurisdiction'.

The Department of Fisheries supervises the operations of the BMU. The Director approves applications to establish BMUs, and endorses the fee structurefor fees to be levied. Annual accounts of BMUs must be submitted to the Department. The Executive Committee (or one of its members) is required to work with the local Fisheries Officer to prepare a co-management plan for the area under the BMUs area of jurisdiction. This plan may specify fully closed or seasonally closed areas and prescribe the type of fishing gear that can be used and the number of vessels allowed to operate there.

The focal area of the project is the coastline stretching southwards from Shimoni and Wasini Island to the tiny fishing community of Jimbo on the Tanzanian border.

The launch of the project coincided with the BMU re-evaluation, and so project activities were realigned to support the Department of Fisheries and communities in reviewing the BMU approach. New operational guidelines were formulated, a training plan was launched, and training modules were designed for BMUs in fisheries management, roles and responsibilities of BMUs, and financial management. By-laws were drawn up, under the regulations, for each of the seven fishing communities, thereby formalising their respective BMUs. In late 2010, with the project support, 60 members from the seven BMUs received training in management modules from the Department of Fisheries.

Membership has been growing, with 300-500 members in each of the seven BMUs by August 2011.

All of these processes laid the groundwork for the creation of Community Conserved Areas (CCAs) in the project study area. These CCAs may best be described as the 'territorial waters' of each community, as agreed between all BMUs along a stretch of coastline and as defined in their respective by-laws. Within their CCAs, communities may establish 'no-take zones' or 'closed areas' in which fishing is prohibited, either permanently or seasonally, or limited to certain types of fishing gear.

This concept of closure is not new; some communities have long recognized the value of closed areas (known locally as tengefu) in maintaining fish breeding grounds and reefs, thereby enhancing their tourism opportunities.

This year, with the participation of the BMU members, the planning team traversed the open ocean, mangroves, seagrass beds and reefs, and defined the boundaries of the CCAs and closed areas, using a GPS, creating a new CCA map for the study area.

Finally, preliminary management plans were drawn up for each CCA that will guide their BMUs in developing them over the next five years.

Through the project, the south coast BMUs have pioneered the way for BMUs in Kenya. Some 60 BMUs have been established along Kenya's coastline but most exist in name only. At least there are now examples to follow on the south coast.Back at Vanga, Bakari is proud to show his BMU identity card. For the first time, through the BMU assembly, he has a voice in how the area's marine resources are managed.

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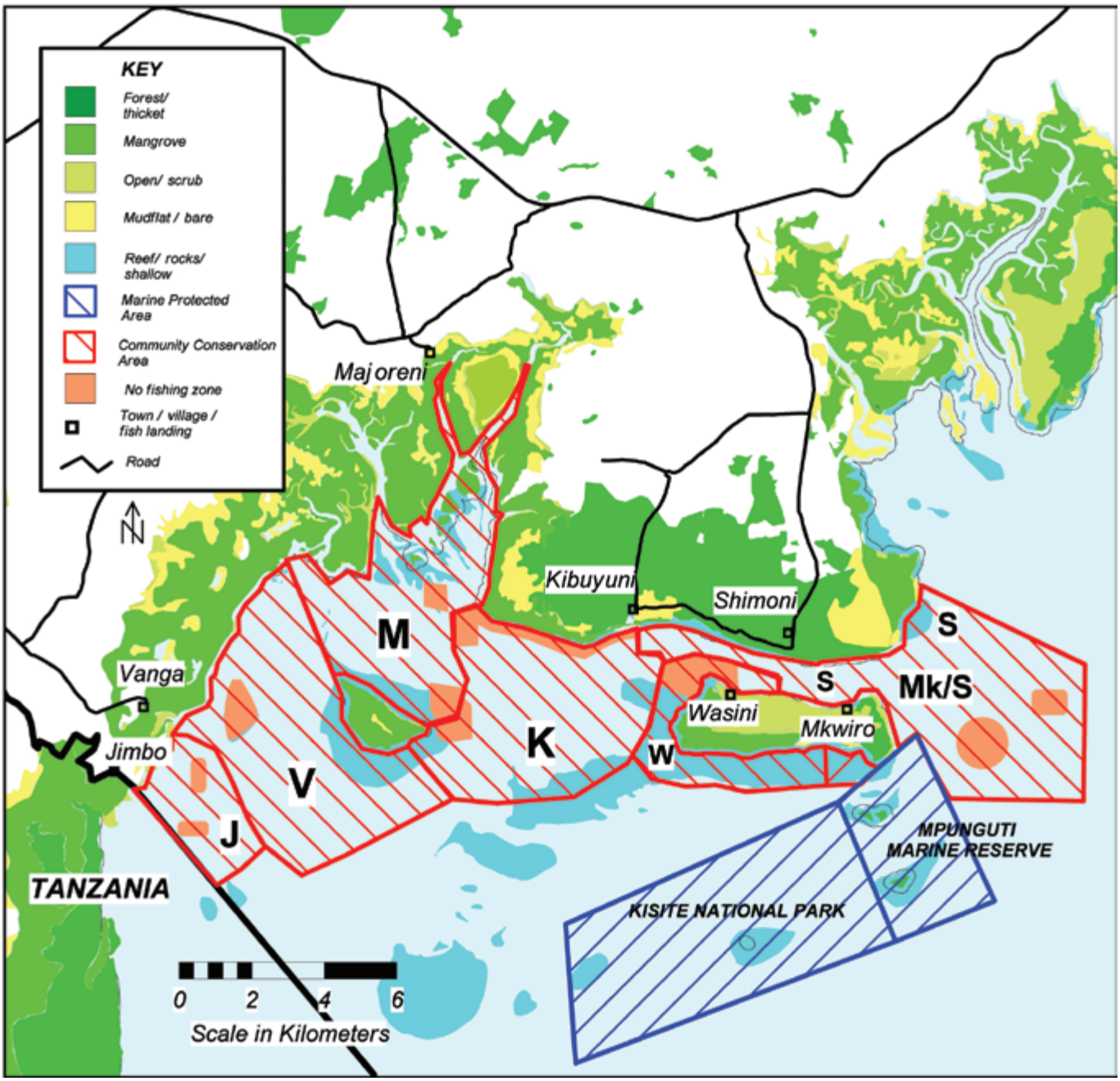
Richard Lamprey is the East African Technical Specialist for FFI. Dishon Murage is the Coastal and Marine Resources Program Coordinator at the EAWLS

Photo: Wasini BMU members discuss Darwin map of conservation areas. Below: Map of CCAs



Coral Gardening

A method to restore damaged coral reefs

By David Derand

Coral reefs around Cousin Island Special Reserve suffered severe degradation after the massive El Nino-Southern Oscillation (ENSO) bleaching event of 1998. Many reefs simply collapsed into rubble which became covered by algae. In 2011, more than thirteen years later, most of the reef areas around Cousin show minimal recovery with low level of both hard coral cover and recruitment. In fact, the reef around Cousin remains dominated by fleshy macroalgae, which is known as one of the major inhibitors of coral recovery.

With little evidence of natural reef recovery, the opportunity to use Cousin Island as a pilot site for a large-scale active reef restoration emerged when in 2010, Nature Seychelles launched its project, *Reef Rescuers - Restoring Coral Reefs in the Face of Climate Change* which is financially supported by US Agency for International Development. The project has since taken off and several important milestones have been achieved.

The project is using the coral gardening method developed by Prof. Baruch Rinkevich of the Israel Oceanography and Limnological Research Institute in Haifa, Israel. This is a two step restoration process where small coral fragments collected from healthy donor sites are grown in underwater sheltered nurseries for a minimum of twelve months, and then transplanted onto a degraded reef.

Surveys were first conducted to estimate the diversity and abundance of coral species at two potential donor (collection) sites and to assess the number of coral fragments that could be harvested for the most abundant coral species at these sites. So far, twelve coral species have been found suitable for harvest without causing irreversible damage to donor colonies.

A model of rope nursery is being used. It has been chosen because of its cost-effectiveness, making the construction of large scale nurseries for branching coral species very feasible. A novel nursery prototype, the net nursery, has also been designed and will be tested later with encrusting and massive species.

The first four rope nurseries were established 300m off the South-West coast of Cousin Island, within the Cousin Marine Protected Area and sheltered from the North West monsoon, on a sandy bottom at about 16m depth.

A team of 6-7 divers - three permanent staff, three volunteers and occasionally a staff member of Octopus Dive

Photo: Collected corals are fragmented and 2-4 cm fragments inserted into ropes

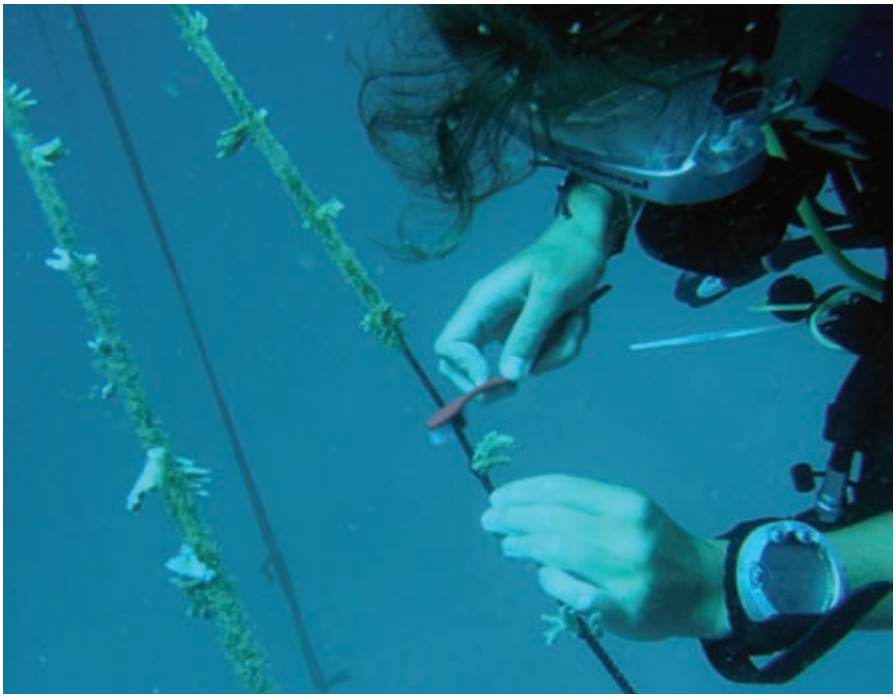
Photo: Underwater rope nursery

Centre perform all daily underwater activities. It took two days and 4 dives to properly build a rope nursery. Then, for about 3-5 days, collected corals were fragmented and 2-4 cm fragments were inserted in ropes that were later laid and attached with cable-ties onto the pipe framework that makes up the nursery. Each rope nursery contains about 5,000 coral fragments. About 20,000 fragments of five different species are currently under culture. The coral fragments have already formed new tissue and covered the rope in less than three weeks.

Maintenance of the nurseries - cleaning of algae and other invertebrates settled onto the ropes and competing with the coral fragments - and monitoring of the health status of each fragment have been conducted on a regular basis. Given the relatively high rate of algae growth, a frequency of maintenance and monitoring every 3-4 weeks has proved to be necessary in these early stages of the nurseries. A toothbrush has proved to be the most efficient tool for carefully cleaning the ropes from algae and other invertebrates without damaging the newly formed coral tissue.

It is also important to follow the recovery of donor colonies, in order to evaluate what can be harvested without causing irreversible damage. Three donor colonies from each species harvested have been photographed before and after the harvest in order to monitor the recovery of scar tissue. Only few days after harvesting, the donor colonies already showed signs of recovery with newly formed tissue and polyps.

Six potential transplantation sites around Cousin Island have been surveyed for the next part of the process . This involves both qualitative and quantitative surveys. A site on the North-East coast was found the most suitable because of the depth gradient, the substrate composition (dominated by rocks but with rubble hills, sand patches and scattered macroalgae), the low hard coral cover that will not cause too much 'noise' for the transplantation act, but with signs of recovery (showing the area is suitable for transplantation) and relatively healthy fish assemblages in order to maintain a low macroalgae cover after reduction.



Coral reef restoration is still in its infancy. The ecosystem we are trying to restore is very complex and it is not well-enough understood for us to be confident of the final outcomes of this pioneer large scale reef restoration attempt. A thorough research plan, which includes both nursery-related and transplantation-related experiments, has been developed and started to be implemented to investigate the different factors that may influence the success of the coral restoration efforts around Cousin Island.

David Derand is the Project Manager for the Reef Rescuers project

Photos: Top - fragment of *Acropora hyacinthus* with newly formed coral tissue covering the rope less than three weeks after being fragmented and inserted.

Bottom - A toothbrush has proved to be the most efficient tool for carefully cleaning the ropes

Linking Science to Management in the Western Indian Ocean: **A myth or reality?**

By Julius Francis

In 2000, WIOMSA pioneered the implementation of the innovative programme, Marine Science for Management (MASMA), whose objective is to provide a mechanism that brings together researchers, practitioners and managers to work across the whole spectrum from problem/issue identification to knowledge generation to use of information generated for management and decision-making processes. Drawing from ten years of implementation, this article briefly describes examples of linking science to management and mechanisms used for that purpose.

A principal component of the MASMA Programme has been the competitive grant programme, which has supported natural or social scientists individually and multi-disciplinary teams, to conduct research on priority regional issues, organize training courses and workshops and print publications. Proposals that have high scientific merit and which demonstrate that their results will provide some tangible (direct or indirect) applications have been given priority during the selection process.

MASMA's activities and efforts have had major impacts in many areas however; this article will limit its discussions to projects linking science to management. In linking science to management, MASMA Programme successes can be assessed in terms of how information generated from its projects has been used in influencing management decisions; in the development of national plans, legislation and policies and in the development of new livelihood options.

Results from the project on "Determination of the Distribution and Characteristics of Fish Spawning Aggregation Sites (FSAS) and their Importance to the Artisanal Fisheries Resources of Seychelles", provided the basis for the enactment of the Fisheries (Amendment) Regulations, 2005 (S.I. 32 of 2005), which aims at preventing the reopening of the live reef fish food trade fishery that severely depleted spawning aggregations at Cosmoledo and grouper stocks in general in the outer islands of Seychelles.

In 2008/2009, the MASMA-funded project on the development of mariculture in Tanzania was involved in the development of By-laws and Management Plans which set aside no-take areas for bivalves in 4 regions in Menai Bay (Fumba Bondeni, Fumba Chaleni, Nyamanzi and Bweleo).WIOMSA's mariculture activities provided useful information during the development of the Tanzania National Aquaculture Development Strategies.

Through the project on Development of Integrated Pond Culture of Finfish, Shellfish and Seaweed in Zanzibar, milkfish and pearl farming have taken off and are currently being implemented in several parts in Tanzania. Production levels for milkfish are steadily increasing; for instance, the annual production (per hectare) has improved from 1 ton to more 7.5 tons.

WIOMSA has used a variety of processes and approaches to encourage linking of science to management, including the competitive research grant programme, writing workshops, production of policy briefs as well as supporting science to policy dialogues.

When the programme was initiated, expectations were that the competitive research grant programme alone would provide adequate incentive for the adoption of science for management concept by the scientific community in the region. Following the realization that this wasn't necessarily the case, WIOMSA started experimenting with 'grant diversity' through the introduction of a broad range of grants mechanisms such as "Commissioned" research, the organization of training courses/workshops and writing workshops. All these have proven to be effective in getting natural and social scientists working together and ensuring the involvement of management authorities from the beginning.

Writing workshops an increasingly common feature of most of the projects, have provided opportunities for brainstorming on key research findings; capacity building for emerging scientists and synthesizing information from multi-disciplinary projects as well as information from relevant projects supported by other partners. Such workshops have resulted in publications in peer-reviewed journals, books, as well as in policy briefs.

Three policy briefs have been produced on migrant fishers of Kenya, and on benefit sharing mechanisms for Mozambique and for South Africa and a number are currently in preparation. Science and policy dialogues have been and will continue to be key part of the Association's engagement and communication strategy. In March 2010, during the Regional Conference on Climate Change, a science to policy dialogue involving senior government officials and scientists was held.

There is no doubt that while MASMA is an evolving programme, important progress has been made in its activities to date. Results from its implementation clearly show that there is recognition that MASMA is an important and necessary concept for this region. MASMA has brought resource managers and scientists from disparate disciplines together than ever before and more importantly, barriers that had prevented natural and social scientists from working together have begun to break down.

Dr. Julius Francis is the Executive Secretary of WIOMSA
Photo: Visiting the first ever bivalve farm in Fumba (WIOMSA)

How do we do it?

Linking Science to Projects

By Nirmal Shah

For many "green" oriented persons living sustainably is equated with "small". As a result many donors are concentrating on funding small community based projects. The GEF Small Grants Program (SGP) is one. I wish to respond to the idea floated recently by a donor staff member that Seychelles needs to emulate community based projects like many in Eastern Africa and Mauritius have undertaken for the last decade or more. In particular I wish to view this idea in the light of climate changes that are and will be sweeping across our islands.

In a paper entitled *Conservation Action in a Changing Climate* Tim McClanahan and co-authors show that across Eastern Africa and the Western Indian Ocean islands management responses to the same environmental threat, e.g. coral bleaching, will necessarily be different because of the different "environmental susceptibilities" and "social adaptive capacities" of the countries. These have been calculated from data that the researchers collected for 8 key indicators in all the countries.

Where a country falls in the management matrix (matrix A) will indicate the kind of broad strategies that the country should take.

For example, the Environmental Susceptibility of Seychelles is calculated to be higher than that of Mauritius because, for one, we have more pristine natural environments than that country. Our social adaptive capacity has been calculated as the highest in the region.

The strategy that Seychelles should adopt therefore, according to the authors, is "Adapt and Transform" (matrix B) by using innovative management and intervention techniques and practices, transforming damaged ecosystems, using new technologies, and so forth.

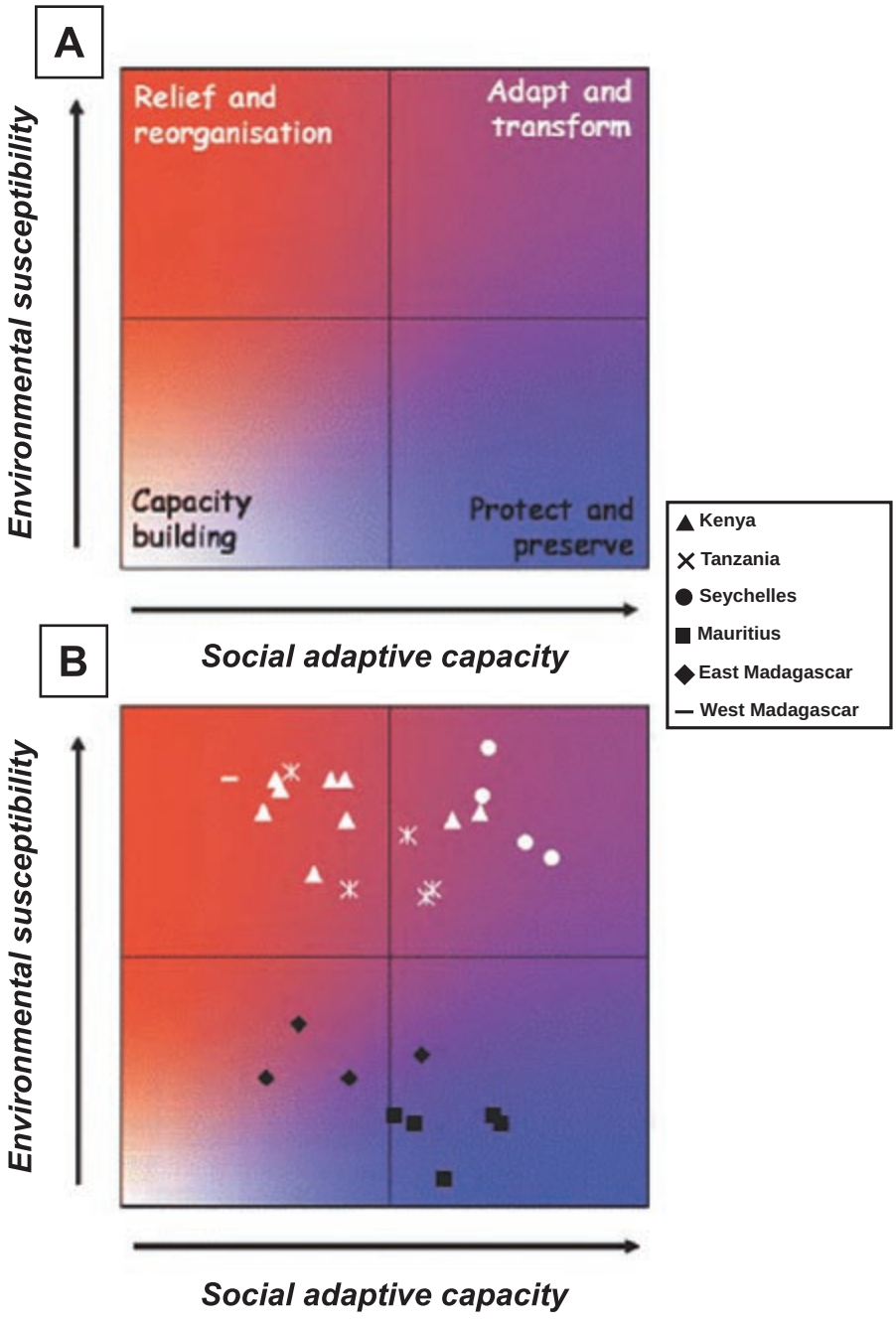
Mauritius falls into the category where it has to "Protect and Preserve" and it is also close to the "Capacity Building" side of the matrix – I believe this is why the GEF SGP has been seeing so many smaller scale activities there since those are more conducive to that modality. In Kenya, there would be many activities at community and local level because they need "Relief and Reorganization".

In Seychelles it is not strange therefore to see that proposals to the GEF Small Grants Program have been largely scientific and technological - because that is exactly what we should be using to Adapt and Transform.

Whilst general donor requirements tie us to the conventional wisdom the need is to use change-making and transformational interventions and adaptive practices to move to the next level.

Reference: Conservation action in a changing climate. T.R. McClanahan, J.E. Cinner, J. Maina, N.A.J. Graham, T.M. Daw, S.M. Stead, A. Wamukota, K. Brown, M. Ateweberhan, V. Venus, & N.V.C. Polunin. Conservation Letters 1 (2008) 53–59

Nirmal Shah is Nature Seychelles Chief Executive



Policy-science Interface

Is an understanding possible?

By Pablo Manzano

Policy and science are related but their relation is not as fluent as many may wish. Scientists are often motivated at their work in order to correct policies that their data show to be wrong, and policymakers prefer to use evidence-based knowledge to shape their policies so that they make sure they are correct. But the inability to communicate results, from one side, and the impatience to wait for sound results, from the other, often makes this relation complicated.

The Eastern and Southern Africa Regional Office of IUCN (the International Union for Conservation of Nature) has recently finalized the book "Conservation and Sustainable Development. Linking Practice to Policy in Eastern Africa". The book analyzes the way practice and policy link up in natural resource management. Along the different chapters, the authors document how policy is influenced in different contexts, such as direct lobbying, influence of parliamentarians or inter-community dialogue, networking and solidarity. In the chapter "Shaping Policies: Science-Policy Interface in Natural Resources Management", I analyze how policy and practice link together and what are the shortcomings of this relationship.

In this chapter, we learn that policy influencing has its short comings but it is possible and it is happening. Probably the example that is most present in the media is the climate change policy. The Intergovernmental Panel on Climate Change is a body of experts that is key in determining the agenda of the UN Framework Convention on Climate Change. The Red List of Threatened Species is possibly the most known product of IUCN, being used not only by conservation planners but also by the scientific community. A more regional example is the constitution of the Indian Ocean Tuna Commission.

But this process is not smooth, as policymakers face different pressures from scientists, especially in terms of short term results. We have the closest example in the recent Durban meeting.

Despite the overwhelming evidence on the negative climate trends caused by human activities, a binding agreement that substitutes the Kyoto protocol remains elusive. Few countries are ready to lose a percentage of economic competitiveness in the short term due to controls in carbon emissions.

This also happens in other Natural Resources Management policies: short-term economic interest supersedes the sustainable development strategies, which are nothing but long-term economic interest strategies. There is also a strong demand from the taxpayers to get results quickly. Therefore policymakers may prefer seeking the advice of technicians (e.g. an agronomist) to the detriment of scientists (e.g. an ecologist).

The scientific method also has an element of uncertainty that makes science advance; any conclusion of a former study can be refuted based on new evidence. But when the pressure for lobbies, electors etc. is high, scientific uncertainties become a burden for political decisions.

Cultural barriers also pose a big problem to the understanding of science-based evidence. Additionally, the problem of cultural barriers becomes worse when traditional knowledge is involved, as it is considered by many as primitive.

To overcome widespread resistance from the population to long-term sustainable development policies, it is fundamental that scientific knowledge is widespread. The communication of science outside academic articles, however, is also a big shortcoming from the scientists' side. Evaluation of scientific curricula does often not reward the participation in popular science publications or the collaboration with journalists, and funders for scientific research exclude these activities in their budgets.

Very good strategies for the use of science in policy include the empowerment of lobby groups such as user associations through specific capacity building programmes that include the mainstreaming of scientific evidence, and where international donors and national programmes can play key roles. Grassroots organizations and NGOs are much more used to the collaboration with media, and policymakers will promote evidence-based policies easier if supported by the local communities.

Pablo Manzano is Global Coordinator World Initiative for Sustainable Pastoralism at IUCN ESARO

Photo: The Red List is used by conservation planners and the scientific community (IUCN)

Love Over Loss

Is it time to change the conservation message?

By Liz Mwambui

Say you were really interested in telling people about nature how would you do it: would you use the shock treatment? Would you keep it simple and memorable? Or would you dress it up, make it sexy and attractive?

Conservation communicators are in a constant struggle to bring nature to the attention of people. And communication is much more urgent now in the face of disappearing species. What we really want is for people to act for nature in a positive way. But how do we ask them to do that without putting them off?

As it turns out, various people have been grappling with this and have prescribed a medley of solutions. One of them is Futerra Sustainability Communications who produced the 2010 Branding Biodiversity message. Based on the experience they gained developing the logo and communication strategy for the International Year of Biodiversity, they came up with a compelling call for effective conservation communication: preach more love and less loss. And to this add targeted need and action.

Futerra arrived at this approach after exploring psychological evidence to find out what drives people to want to conserve nature. To do this they looked at current messages to see whether they line up with their audiences. They then combined this with the principles of branding used to sell products packaged as a set of values and promises which trigger action. The result they say challenge people to "deliver a new nature message."

The new message needs to be simple. Like brands in real life, it should act as a cue for a larger body of information. This is because conservation is a very complex subject and because of this communicators are caught in the trap of trying to say everything at once.

The message as it is communicated today falls under these areas: Loss (based on extinction e.g the Red List); Love (messages based on awe and wonder such as nature documentaries); Need (based on economics and value e.g ecosystem services like water, and nature based- tourism); and action (such as Earth day). The biodiversity brand does not necessarily need them all.

Less loss

Futerra asserts that we need to do away with the loss aspect of the brand. They came to this conclusion by looking at the audience. People, they conclude, are emotional rather than rational. This is why although communicators often supply people with facts, this logical information doesn't always seem to change behaviors. And for the majority of people, the extinction message induces guilt and pushes them to apathy instead of the expected action.

More love

Action requires love and so we need to make the love connection in our messaging. Love messages work because people love how nature makes them feel, they are affected emotionally by experiences of nature especially those they had in childhood. We need to reconnect them with these experiences. And as brand values go, wonder, awe and joy are powerful. So the brand needs to keep the love.

Target need

Need messages target the economics of nature and they can be very impressive. But Futerra argues that they too depend on our rational minds, which cannot be depended on. The second problem, they say, is that "Need" and "Love" don't go well together. In other words you can't put a price on something you love. Need however is a powerful tool for another audience that might find the love message too "soft" - policy makers. Thus Futerra prescribe "Love for the public" and "Need for the policy maker."

Add action

On their own, love and need are not enough. The audience must be asked to act.

This formula Futerra concludes, is merely the building blocks of the biodiversity brand. Communicators need to bring it to life in their messages.

Liz Mwambui is Nature Seychelles' Communication Manager

Photo: Peter Chadwick

YOUR STORY:

Snake eats gecko

During their stay on La Digue, Harald & Claudia Ehses were lucky to catch on camera the moment a Seychelles wolf snake *(Lycognathopis seychellensis)* caught and ate a green gecko in a tree just above them on the beach at Source d´Argent. They've sent these pictures in to us.

How to feed a tropic bird

Members of the public sometimes bring us injured or distressed animals that they have rescued and don't know how to handle. Recently we received a terrapin (which was released into the wetland), and white-tailed tropicbird, fairy tern and tropical shearwater juveniles unable to fly. We try to see whether they are hurt or just stunned. If they need a few days to recover then one of our staff takes them home and looks after them. Of late it's been Martin, our community and stakeholder coordinator whose children love the thrill of having the chicks in the house. Iona, Martin's daughter has learnt how to care for the chicks from Riaz, our science coordinator. Below in her own words she tells us how she cared for the white-tailed tropicbird chick.

"Guess what I just did... can you guess? No? ok I'll tell you, I HAND FED a BIRD!!!!! well, I held the bird (the bird is called a white tailed tropic bird) while dad held the beak open and Sophie fed it. We have to force feed it because it's a baby and we have to teach it to fly too! We also have to feed it 4 times a day. This is how to hand feed a tropic bird in 5 simple stages; 1. Mash up some fish or squid with some water and put on a plate. 2. Gently grab the bird directly down and tuck your thumbs under it's head. 3. Then you wrap it in a old tea towel. 4. You take 3 people one to hold the bird firmly, the other to hold open the beak (don't break the beak) and the last to shove the food down it's throat, then the 2nd to close the beak. 5. If the bird shakes it's head it could get very messy, but if it puts it head back and looks likes it's choking it's swallowing. Repeat until the plate is empty."

Visit Cousin Island, the Island that belongs to birds

Humans are welcome

Talk to your travel agent or call the Island Conservation Centre, Praslin, Tel: +248 2783144 icc@natureseychelles.org for a local tour operator

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