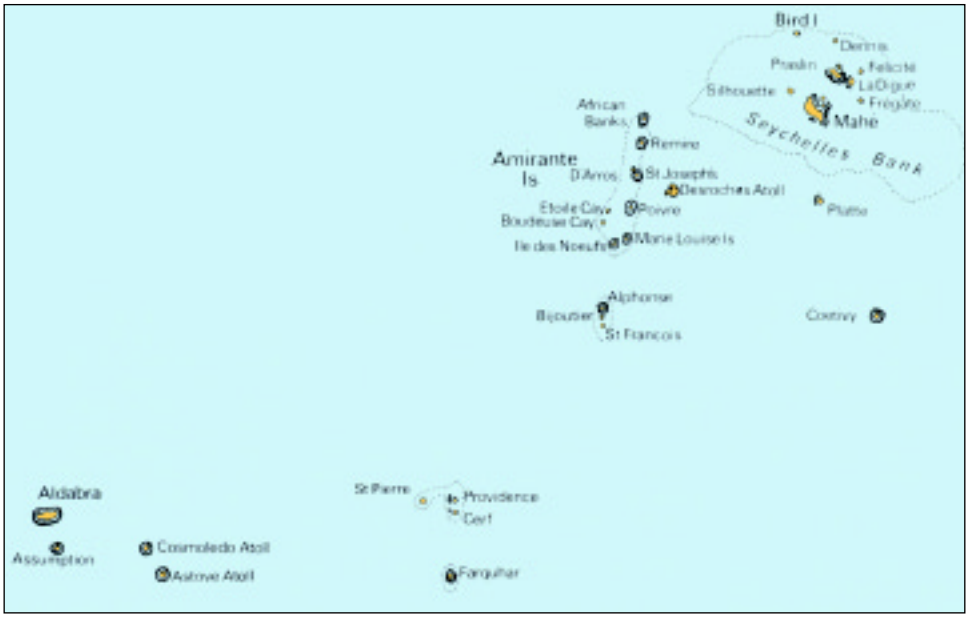
Eco-tourism as a source of funding to control invasive species

The case of Seychelles

by John Nevill



The special circumstances of Small Island Developing States (SIDS) and island ecosystems in general, have been much discussed in the forums of international environmental negotiation, such as the Convention on Biological Diversity (CBD), and through the Barbados Declaration and its ensuing processes. The significance of SIDS as centres of endemism, their: vulnerability to alien invasive species, disproportionate per capita infrastructure and skilled human resource requirements,

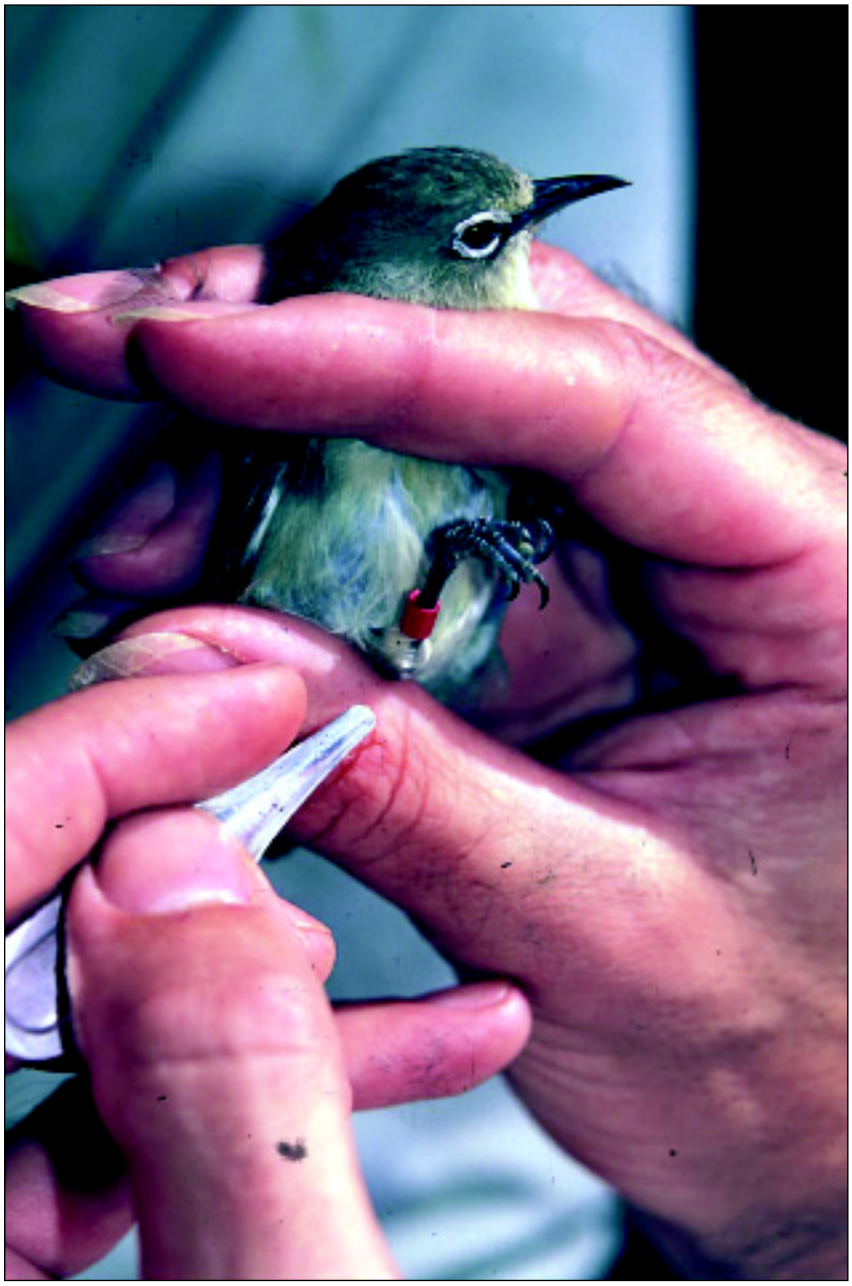
limited terrestrial resources and often necessarily skewed balances of trade etc… have all been discussed at length and made subject of much study and publication.

These points are, of course, all relevant if not vital factors when the international community considers ways and means of enabling SIDS' pursuit of sustainable development; but this is only half the story. SIDS and island ecosystems have much to offer the international pursuit of sustainable development; and the conservation and sustainable use of biodiversity, respectively.

SIDS are microcosms of their continental counterparts where strategies, policies and management regimes for sustainable development can be applied, tested and refined; where the components of cause and effect are more readily assessed, outcomes more rapidly seen and results more specifically tangible. Much the same can be said of island ecosystems which, with their high endemism, offer great potential to advance the cause of biodiversity management and assist the CBD in meeting its global 2010 targets. Islands are self-contained ecosystems with well defined geographic limits that encapsulate fundamental ecological processes and interactions. These ecosystems because of their scale offer scope for holistic management and rehabilitation.

In both scenarios, SIDS and island ecosystems, stratagems can be tested and the findings extrapolated to continental scenarios. Islands are natural laboratories for science and research; this is as true today, for the elaboration of regimes for environmental management and the conservation and sustainable use of biodiversity, as it was in the nineteenth century for the elucidation of evolutionary theory. It is to be hoped that this potential is recognised through for example, the timely and substantive development of the CBD programme on Island Biodiversity. The focusing of efforts and resources here can provide rapid and disproportionate yields in terms of progress towards achieving the 2010 biodiversity goals and the development of management approaches for extrapolation globally.

John Nevill was formerly the Director of Conservation in the Seychelles' Ministry of Environment and Focal Point for the Convention on Biological Diversity for six years. John has been active in the workings of the Convention on Biological Diversity notably COPs, SBSTTA and the negotiations for the Cartagena Protocol on Biosafety since 1997 and continues to attend certain meetings as a member of the Seychelles delegation.
John works today as Environmental Consultant and as Director of the Marine Conservation society, Seychelles - a Non-Governmental Organisation registered in Seychelles.



The Seychelles White-eye (Photo by Gerard Rocamora)

The conservation and sustainable use of biological diversity is a fundamental precursor to the realisation of sustainable development. In many countries this means harmonising the development and activities of major industries with the needs and tolerances of natural systems. In Seychelles, as is the case for most SIDS, tourism is a primary industry and a major employer. So the challenge in Seychelles is to harmonise the tourism industry, its development and activities, with the needs of environmental management.

Seychelles is recognised as a centre of biodiversity[1] with more than 1200 endemic species identified to date on a tiny landmass of some 445 square kilometres divided between 115 islands. The key centre of this biodiversity is the 39 granite islands that were separated from continental masses more than 70 million years ago. The granite Seychelles today are some 1000 miles from the nearest continental landmass. In Seychelles the primary threat to biodiversity is without doubt that posed by Invasive Alien Species (IAS). One thousand miles and 70 million years clearly meets the criteria of the "geographically and evolutionarily isolated ecosystems" that are a priority under the CBD's IAS programme.

So the logical step is to find a means by which to channel resources from tourism to address this issue – eco-tourism development offers such a bridging mechanism.

Seychelles has two island reserves, of longstanding, that derive their revenue from ecotourism and as such the concept is well understood and recognised in-country.

Seychelles is afflicted by many invasive species such as cinnamon and albizia, some fifty species of creeper, birds such as the Indian Mynah and the South African Barn Owl. Escaped livestock and fowl have caused major problems on certain islands: goats on Aldabra have severely denuded the vegetation depriving giant tortoises of food and shade; feral pigs were identified in 1996 as digging up virtually every turtle egg clutch laid on the island of Menai, Cosmoledo atoll (Mortimer.1998). Chickens and pigs have been removed from islands for fear that they would compete with the endangered Seychelles Magpie-robins for food. Cats on Aldabra have been found to favour feeding on marine turtle hatchlings (Mortimer. 1998) and this habit is likely prevalent on other turtle rookeries where they occur. Most damaging to date, however, are rats. The intelligence, broad feeding niche, fecundity and general adaptability of the *Rattus sp*. make them a most effective invader. Seychelles has been colonised by two species *Rattus norvegicus* and *R. rattus*, their impact upon flora and invertebrate fauna is likely extensive but is poorly understood. With regard to birds, however, the impact of rats is well known. Within the granite Seychelles there are six endemic species and one endemic subspecies of terrestrial bird that are endangered, of these only one is believed to be able to co-exist with *R. rattus.*

In 1995 Bird Island a flat coralline island successfully undertook a rat and rabbit eradication and whilst a much simpler topography and ecosystem than the granite islands showed that current techniques were effective in the tropical scenario.

In 2000, following 2 years of preparatory work the Government of Seychelles led and coordinated a three island rat and cat eradication campaign. Islands were selected

[1] Seychelles has been classified as part of the Indian Ocean islands biodiversity Hotspot by Conservation International and as an Endemic Bird Area (EBA) by BirdLife International.

as per the potential they offered for the re-introduction of bird species. Two of the islands were private and funded their own operations with the primary goal being to introduce endangered bird species which would create additional attractions for their existing tourism (private island hotel resort) operations.

Government facilitated this activity by: identifying and importing the expertise, undertaking the preliminary bait testing and rat and cat surveys, coordinating the project implementation; waiving tax requirements on the import of baits and equipment and providing field staff to assist in implementation. The main support however came from the economies of scale that resulted from undertaking the activities on three islands within the same time period. Despite this operations were still costly because the mountainous terrain and/or size of the islands required the use of helicopters, with satellite navigation systems, to ensure a complete bait distribution. Bait deployments were undertaken twice at eleven day intervals to ensure that juvenile rats in nests during the first application would be caught in the second. On one island due to poor weather conditions a third application was utilised and this has subsequently become the recommended regime.

Despite all these difficulties maintaining an island rat-free is more demanding still. Two of the three islands in question were subsequently re-infested, it is believed, when rat abatement protocols were not correctly followed. The difficulties faced vary with the degree of development and the amount and nature of traffic going to and from an island. It is however, the island with the most logistical requirements of the three, Fregate, which has maintained its rat-free status since 2000. Bird Island has maintained its rat-free status since eradication in 1995 whilst running a thriving hotel-resort operation. In addition 3 other islands in the central Seychelles have all maintained there rat-free status despite busy tourism activities in terms of visitation and one despite undergoing two major construction phases in the 1990s. This demonstrates that maintaining islands rat-free is feasible, even with considerable commercial and logistical activities.

What is particularly interesting is that the private sector has embraced the application of this technology in Seychelles despite the high profile failure of two islands. Four islands have very recently undertaken rat-eradication campaigns. Two are the granite islands of North and Anonyme, Denis which failed in 2000 has tried again and the fourth is the distant coral island of D'Arros. The willingness of the private sector to take on such initiatives reflects the realisation that eco-tourism is the fastest growing niche market in the tourism industry; and in the Seychelles context where the trend is increasingly to target the top-end tourist market exclusive nature reserve island resorts are very much en vogue.

A brief survey of island managements that have undertaken rat eradications showed that eco-tourism was the (or one of the) primary motivation(s) behind the activity along with philanthropy and direct commercial issues e.g. "exclusive 5 star tourism and rats don't mix."

Despite some capacity for eradication now being localised, costs are still high and are determined by numerous factors: island size, topography and predominant vegetation type; occurrence of endangered non-target species and methodology used (ground- or air-dispersal of bait). Costs per island have varied accordingly from US$10,000 – 250,000. In addition recurrent costs are an open-ended commitment - capital still being required to maintain bait stations and infrastructure such as rat fences, rat-proof rooms etc…

This "privatisation" of biodiversity management under Government supervision, addressing endangered biodiversity, is a great step forward in Seychelles' efforts to conserve its natural heritage and meet its international commitments. Not to mention the alleviation of the financial burden on Government. In Seychelles rat eradications have already greatly enhanced the conservation status of three endangered bird species -the Seychelles Magpie-robin, the Seychelles White-eye (Rocamora. 2003) and the Seychelles Fody – and various endemic species of invertebrate.

Furthermore should the recent eradications prove successful (this takes at least one-year to determine) two more endangered species will likely benefit – the Seychelles Black Paradise Flycatcher and the Seychelles Warbler – and it is possible that by the turn of the decade some species could be removed from the endangered listings! Eco-tourism is the perfect mechanism in this regard because it is in the vested interest of the operator to ensure the conservation and sustainable use of the biodiversity resources that are the source of its income.

Small islands with tourist operations offer great potential for biodiversity conservation because they can be re-habilitated and the tourism operation provides the funds and capacity to enable this. However for such efforts to continue it is vital that their

The Seychelles Magpie-robin (Photo by David Duthie)

contribution be recognised and this recognition must necessarily be structured in terms of incentives and assistance to enable agencies to fulfil this role.

A survey of the managements of the islands in question identified various mechanisms that could be put in place to foster such activities. The primary responses were as follows:

- Financial incentives, for example exemptions from certain tourism taxes for alien-predator-free islands that participate in national conservation schemes.
- Tax rebates on biodiversity rehabilitation investments such as rat eradications.
- The development of insurance regimes to protect islands against the costs of dealing with non-negligent or 3rd party alien species introductions.
- Provision of a protected status which caters for tourism activities (current protected status classifications are somewhat preclusive of this) and allows for greater control over access to alien-predator-free islands, thereby lowering the risk of inadvertent reintroductions.

The cost of managing the complex biodiversity of often isolated tropical islands is generally beyond the means of Governments and national institutions; it requires the harnessing of the infrastructure and resources of tourism. Indeed tourism in many cases offers the only hope of imbuing non-consumptive value to biodiversity such that it can be managed in a sustainable manner. It is therefore imperative that mechanisms and incentives to enable this are developed and refined internationally through the CBD for adaptation to national scenarios (e.g. Incentive measures programme, Sustainable tourism programme and Island Biodiversity Programme) to the benefit of national and international undertakings and the workings of the Convention as a whole.

References:

CURRIE, D. HILL, M. MILLET, J. BRISTOL, R. NEVILL, J. & SHAH, N. J. 2003. Conservation Options for the Seychelles Black Paradise Flycatcher (Terpsiphone Corvina). *In: Ecological Requirements of the Seychelles Black Paradise Flycatcher Consequences for Conservation and Management. Currie, D. Editor. Nature Seychelles Monograph Series I.*

MORTIMER. J.A. 1998. Turtle and Tortoise Conservation. Government of Seychelles , Final report.

NEVILL. J.E.G. 2000. Ecotourism as a Source of Funding to Control Invasive Species. *In GISP, A Toolkit of Best Prevention and Management Practices for Alien Invasive Species.*

NEVILL. J.E.G. 2001. Integrating Biodiversity into the Tourism Sector: a case study on the Republic of Seychelles**.** *A contribution to UNDP/UNEP/GEF Biodiversity Planning Support Programme thematic study on "The Integration of Biodiversity into the Tourism Sector.*

PARR, S.J., HILL, M.J., NEVILL, J.E.G., MERTON, D.V., SHAH, N.J. 2001. Eradication of Introduced Mammals in Seychelles in 2000. *Secretariat of the Convention on Biological Diversity (2001). Assessment and management of salien species that threaten ecosystems, habitats and species. Abstracts of keynote addresses and posters presented at the sixth meeting of the Subsidiary Body on Scientific, technical and Technological Advice, held in Montreal, Canada, from 12 to 16 March 2001. Montreal SCBD, 146p. (CBD Technical Paper no.1).*

ROCAMORA, G., HENRIETTE, E., CONSTANCE, P. 2003. Successful conservation introduction of the Seychelles white-eye on Fregate Island, Seychelles. *Reintroduction News. Newsletter of the Re-introduction Specialist Group of IUCN's Species Survival Commission (SSC). No. 22, p. 46.*