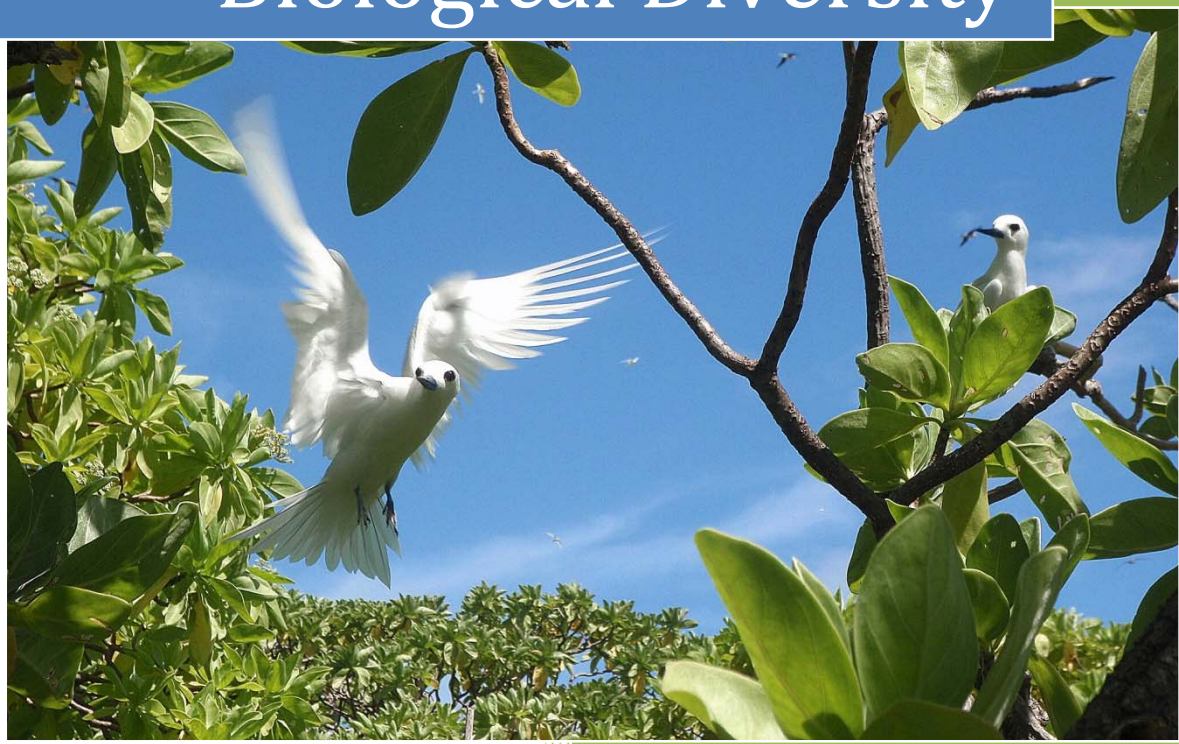
NATIONAL ENVIRONMENT SERVICE
TU'ANGA TAPOROPORO
COOK ISLANDS

2011

Cook Islands 4th National Report to the Convention on Biological Diversity



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Cook Islands 4th National Report to the Convention on Biological Diversity 2011

Approved by the Cabinet of the Cook Islands Government
on the 8th of April 2011 [CM (11) 0125]

Acknowledgements

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Cover photograph courtesy of James Mataa

Prepared for the
National Environment Service ©

2011

Foreword

Kia Orana,

It is with great pleasure that the Cook Islands submit its first National Report to the Convention on Biological Diversity.

The Cook Islands takes its commitment to preserving biodiversity very seriously. This is not only because of our obligation as a signatory to the Convention but because we believe that it is a matter of national priority as it is linked to the livelihoods of the people in our islands.

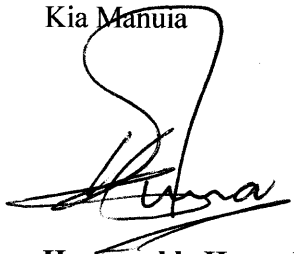
We have taken a path to development where sustainability is paramount. In all our efforts we will aim to strike the balance between development and conservation.

This report focuses on the threats to our biodiversity, while at the same time highlighting some of our successes. We are now better positioned to provide direction as well as coordinate national programs for the protection of our environment through mainstreaming the National Biodiversity Strategy and Action Plan (NBSAP) into the National Environment Strategic Action Framework (NESAF) and into our National Sustainable Development Plan (NSDP).

Without a doubt, the Cook Islands as a small island developing state will continue to face the challenges of biodiversity loss, especially in the face of climate change, and we will continue to seek support from our international partners to assist us through more and adequate technical and financial support. Our success with the *Kura* reintroduction project is a fine example of collaboration between International Governments, Communities, Private Enterprise and Development Partners to address the loss of biodiversity. In the same token the Cook Islands Government endures to work in partnership with the community, traditional leaders, and non-government organisations to address the challenges of biodiversity conservation.

It is therefore with great delight and through this Report that we share with other Parties our experience in addressing biodiversity loss and conservation, and reaffirm the commitment of Cook Islands to the Convention on Biological Diversity.

Kia Manuia



Honourable Henry Puna
PRIME MINISTER of the Cook Islands
Minister for Environment

Executive Summary

This report is presented in 4 chapters.

Chapter 1 provides background on the process of developing the Cook Island National Biodiversity Strategy and Action Plan (NBSAP). The Cook Islands was one of the first countries to commit to the CBD by signing it at the Earth Summit in 1992, and the Cook Island National Biodiversity Strategy and Action Plan (NBSAP) was one of the first to be completed for the Pacific Region. This in itself was a positive step towards implementation of the CBD. The NBSAP was prepared based on feedback from stakeholder workshops. However, progress on implementation of the NBSAP has been limited, and significant progress has been made only in several areas in regard to meeting the targets of the CBD.

Chapter 2 deals with progress on implementation of the NBSAP. The most significant achievement has been the improvement in the status of threatened species, and this target has been achieved through the upgrading of the Rarotongan Flycatcher (*Pomarea dimidiata*) from critically endangered to endangered on the IUCN red list of threatened species, in addition to this a number of other targets have been partially achieved. The Cook Islands Biodiversity database, listing the country's biodiversity is a significant and on-going step towards achieving article 7 of the CBD.

Chapter 3 relates to mainstreaming of biodiversity considerations throughout both Government and non-government institutions. This was attempted through the incorporation of the NBSAP into the National Environment Strategic Action Framework (NESAF) and the subsequent inclusion of the NESAF into the National Sustainable Development Plan (NSDP). Despite this, the policy framework did not translate to on the ground mainstreaming of biodiversity concerns. A table is presented showing the role of various institutions in biodiversity.

Chapter 4 looks at the CBD targets, and shows the status of the Cook Islands in meeting these targets. Success has been achieved in relation to Goal 2, promoting the conservation of species diversity. Areas where achievements have not met the targets include percent coverage of protected areas, and effective mainstreaming of biodiversity. Another area where more effort is required is in the formulation and implementation of effective management plans for major alien species that threaten ecosystems, habitats or species.

Though many targets have not been met, overall, the Cook Islands have made considerable progress towards meeting their obligations under the CBD. The main problem lies not with lack of progress, but in trying to find where this progress has been made. There is a need to improve the monitoring and evaluation system in order to identify progress. The preparation of a report such as this should be an ongoing activity, with progress against goals recorded as it is made. This will make the preparation of future reports much more straightforward, and easily completed using the capacity within the National Environment Service.

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Glossary of Acronyms

ABS	Access and Benefit Sharing
ADB	Asian Development Bank
BCU	Biodiversity Conservation Unit
BPOA	Barbados Programme of Action
CBD	United Nations Convention on Biodiversity
CBO	Community Based Organisation
CDM	Clean Development Mechanisms
CINBSAP	Cook Islands National Biodiversity Strategy & Action Plan
CINCSA	Cook Islands National Capacity Self Assessment
COPs	Conference of the Parties
CZM	Coastal Zone Management
EIA	Environmental Impact Assessment
EMCI	Emergency Management Cook Islands
FAO	United Nation's Organization for Food and Agriculture
GEF	Global Environment Facility
GIS	Geographical Information Systems
GMOs	Genetically Modified Organisms
LMOs	Living Modified Organisms
IUCN	International Union for the Conservation of Nature
IWP	International Waters Programme
MDG	Millennium Development Goals
MEAs	Multilateral Environmental Agreements
MMR	Ministry of Marine Resources
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOW	Ministry of Works
NEMS	National Environment Management Strategy
NES	National Environment Service
NESAF	National Environment Strategic Action Framework
NGOs	Non-Government Organisations
NHT	Natural Heritage Trust
NSDP	National Sustainable Development Plan
PILN	Pacific Invasives Learning Network
POWPA	Programme of Work on Protected Areas
SGP	Small Grants Programme (under the GEF)
SIDS	Small Island Developing States
SOPAC	South Pacific Applied Geoscience Commission
SPREP	Secretariat for Pacific Regional Environment Programme
TCA	Takitumu Conservation Area
TIS	Te Ipukarea Society
TKP	Traditional Knowledge Practices
TWCMP	Takuvaine Water Catchment Management Plan
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WCPFC	West and Central Pacific Fisheries Commission
WSSD	World Summit on Sustainable Development
WWF	World Wide Fund for Nature

Chapter 1: Overview of Biodiversity Status, Trends and Threats

Chapter 1: Overview of Biodiversity Status, Trends and Threats

1.1 Introduction

This chapter provides an overview of the biodiversity status of the Cook Islands, and covers the following:

- an overview of the status of terrestrial and marine biodiversity with lists of endangered and invasive species, setting the scene for reporting on the progress of the Cook Islands National Biodiversity Strategy and Action Plan (NBSAP) implementation and evaluation;
- threats analysis highlighting the key threats and changes to the terrestrial and marine biodiversity.

1.2 Status of Biodiversity in the Cook Islands

1.2.1 Geography

The Cook Islands is a group of 15 small islands with a total landmass of 240 km^2, located in the South Pacific Ocean. They are spread over an ocean area of 2 million km^2 between 9° and 23°S latitude and 156° and 167°W longitude. The country's islands are divided into two regions, a northern group and a southern group.

The Northern Group consists of five atolls (Pukapuka, Rakahanga, Manihiki, Suwarrow and Penrhyn), and a sand cay (Nassau). The Southern Group consists of four makatea[i] islands (Mangaia, Atiu, Mauke and Mitiaro), two atolls (Palmerston and Manuae), one almost-atoll (Aitutaki), one sand cay (Takutea) and one high island (Rarotonga). Twelve of the islands are permanently settled, while the other three islands are wildlife reserves (Suwarrow, Takutea, and Manuae). Figure1 shows a map of the Cook Islands in relation to the neighbouring Pacific Island States and Figure 2 shows a map of the Cook Islands Exclusive Economic Zone (EEZ).

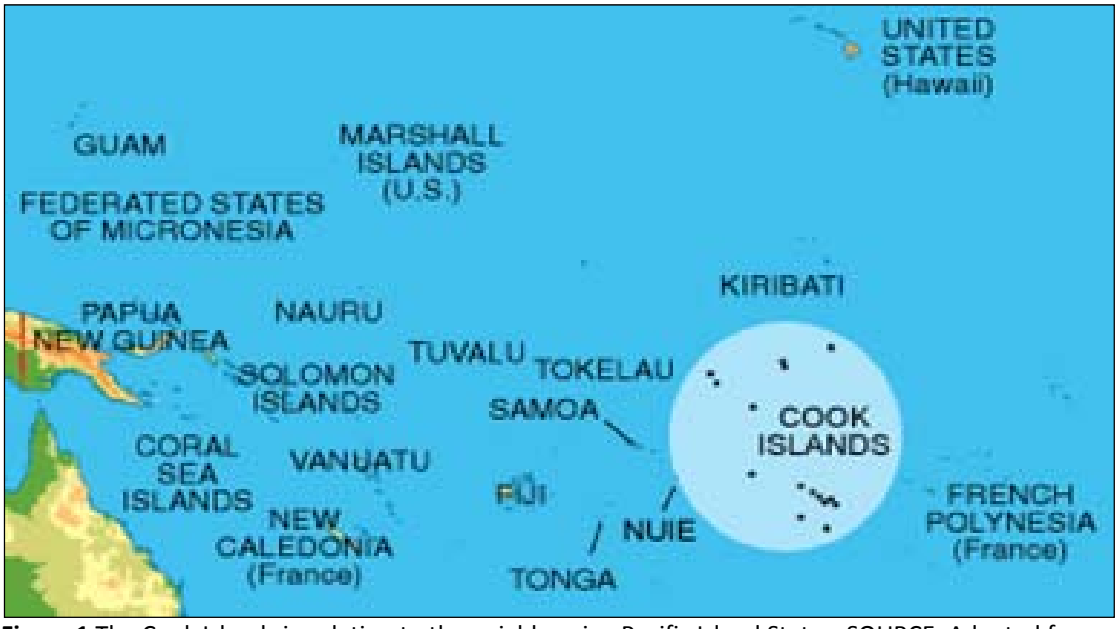


Figure 1 The Cook Islands in relation to the neighbouring Pacific Island States. SOURCE: Adapted from http://sites.google.com/site/100places/cookislands

[i] Raised reef platform

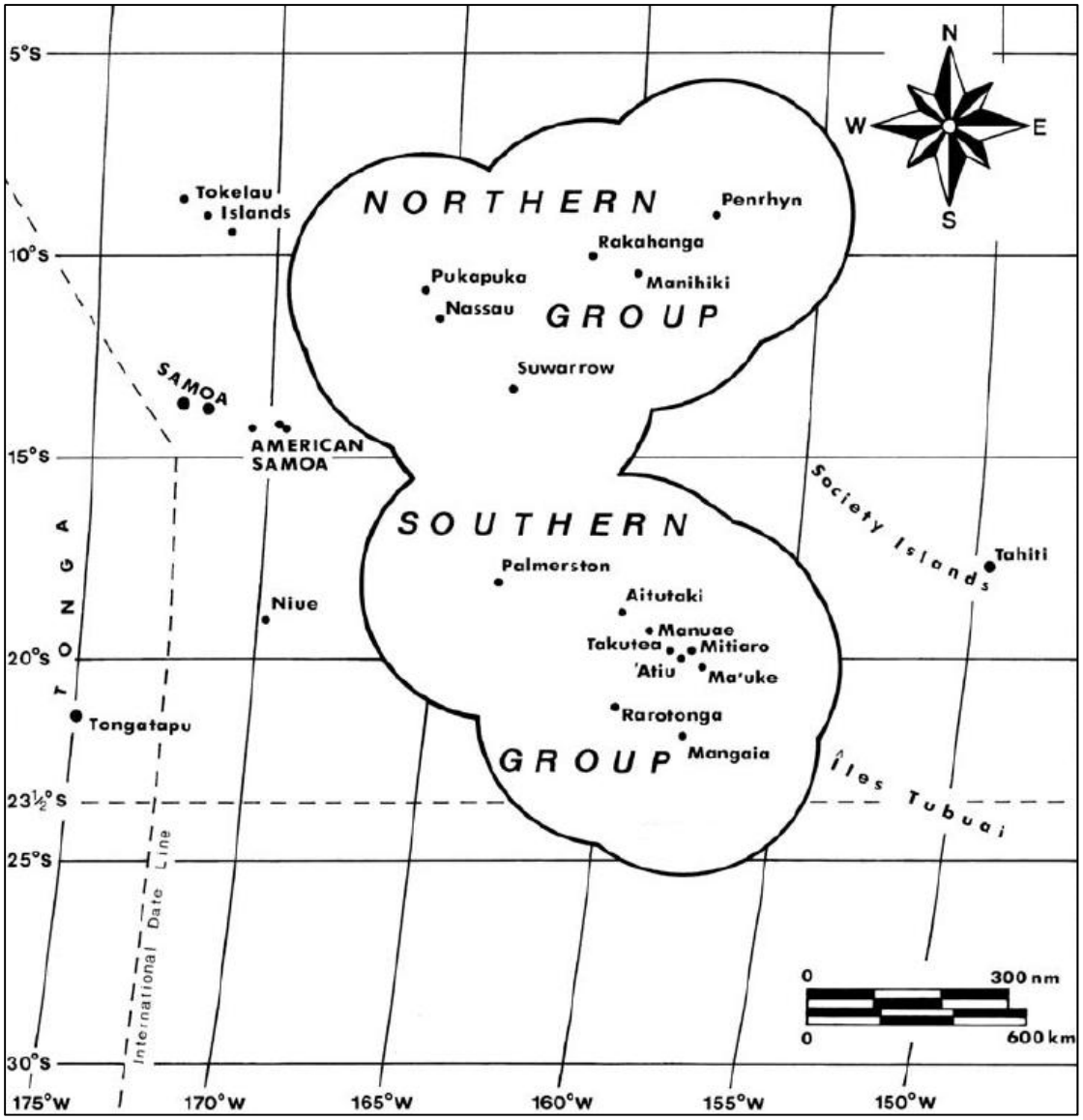


Figure 2 The Cook Islands map showing the 200-nautical mile Exclusive Economic Zone Boundary. SOURCE: (de Scally, 2008)

1.2.2 Biological and Habitat Diversity

Native biological diversity in the Pacific Islands is governed primarily by the islands size and its relative location to species source areas. Isolation from these source areas and extended periods of isolation also plays a role in improving diversity through adaptive radiation. The islands in the western Pacific Ocean are generally larger than those in the east, which provides for greater habitat diversity in the west and hence greater potential for species diversity. The shorter the distance from source areas increases the likelihood that a species will disperse to new areas thereby providing more chances for new establishment in these closer islands. Governed by these two characters we tend to see general negative species diversity attenuation as we travel from source areas in the western pacific i.e. Indonesia and Papua New Guinea to sink areas in the east e.g. Cook Islands, French Polynesia and Easter Island. Adaptive radiation is exemplified by the native biodiversity found in the Hawaiian archipelago, particularly the Honeycreeper (Drepanidinae) and *Hibiscus* families where isolation

over long periods of time have resulted in a myriad of endemic species evolving from a single or a few common ancestors through niche diversification. Accordingly what we see for Pacific Island biodiversity is significant diversity while at the same time we see significant disparity between countries. The islands to the west have some of the richest flora and fauna in the world while the islands of the east have a more impoverished collection of species. The several species groups of the Pacific illustrate this negative species diversity attenuation as shown in Table 1.

Table 1 Comparative species counts across the South Pacific illustrating the west-east species attenuation

Number of Representative Native Species				
Country	**Flowering Plants**	**Fern and Allies**	**Birds**	**Terrestrial Mammals**
New Caledonia	3000[i]	300[ii]	68[iii]	11[iv]
Fiji[iv]	426+	230	57	6
Samoa[v]	~500	220	51	3
Cook Islands[vi]	185	100	29	1
Marquesas Islands	240[vii]	94[viii]	15[viii]	0[ix]

Applying these trends to the Cook Islands we expect that the native biodiversity should be considerably less diverse than populations in the west and this is in fact the case for the Cook Islands. The native flora and fauna of the Cook Islands is disharmonic in the sense that amphibians did not establish in the Cook Islands and that mammals are significantly under-represented with only the Pacific fruit-bat or *Moa Kirikiri* (*Pteropus tonganus*) establishing.

Terrestrial native biodiversity within the Cook Islands can be described as small and lacking many of the common taxa found in larger islands and continental landmasses. This description is characteristic of oceanic islands with small land area and isolated from larger landmasses and biodiversity hotspots located to the west. The limitation on available land area directly limits the availability and diversity of habitat and ecosystem types which further limits terrestrial diversity range possible for the Cook Islands.

As with terrestrial biodiversity, the spread of life in the marine environment is sparse, however this environment has not been thoroughly researched or investigated so our interpretation of its biodiversity is limited to the amount of available information we have on hand. Similar to terrestrial biodiversity, the country's isolation from the centre of marine biodiversity known as the 'Coral Triangle', located in the west has resulted in fewer known marine species establishing themselves in the Cook Islands. Though there is some ecosystem diversity between the high islands in the south, with their shallow lagoons and fringing reefs, and atolls in the northern group with their large,

[i] (Morat, 1993)
[ii] (Brownlie, 1965)
[iii] (Chazeau, 1993)
[iv] (Government of Fiji, 2010)
[v] (Government of Samoa, 2009)
[vi] (McCormack, 2007)
[vii] (Wagner & Lorence, 2002)
[viii] (Adamson, 1932)

deep lagoons encircled by coral reef, there remains overall, a limited number of marine ecosystems present. Marine ecosystems that are present include lagoonal coral reefs, reef slopes, seamounts, sea bed, and the open ocean water column. Mangroves and sea-grass beds are two important tropical marine ecosystems that are not represented in the Cook Islands, though archaeological evidence suggests that mangroves did exist in Mangaia in prehistoric times[i].

The following section will detail each island's habitat diversity and illustrate the known species diversity for key species groups[ii]. For charismatic larger species such as the flowering plants, birds and mammals the species estimates are reasonably accurate however for lesser studied groups such as the insects these estimates are greatly understated. Appendix 1 includes maps detailing various habitat types present

Rarotonga

The largest and most populated island of the Cook Islands is volcanic in origin reaching an elevation of 652m with an area of 67km^2. Principle native terrestrial habitats include the only cloud forest in the Cook Islands, unique upland sloping forest, sprawling secondary growth fern lands, modified wetlands and remnants of coastal and strand forests. The cloud and upland forests provide critical habitat for many native species including 24 endemic species. Native marine habitats are limited to fringing coral reef, shallow lagoon systems never exceeding a depth of 4m, off-shore water and one diminishing saltwater marsh located in Avana, Ngatangiia. In addition to providing spawning and nursing grounds from many fish species, the marshland also provides for two species of native Fiddler Crab, the *Koiti Raukura* (*Uca crassipes* and *U. tetragonon*). Several areas of Rarotongan lagoon are protected under various forms *raui* (customary management) for an indefinite period of time.

Table 2 Native species present and breeding on and off-shore of Rarotonga

Species Group	Number of Native Species Present
Fern and Fern Allies	94
Flowering Plants	152
Corals and Sponges	81
Insects	195+
Reptiles	2
Birds	18
Mammals	3

Figure 3 Reef, lagoon, coastal and mountain ecosystems on Rarotonga. SOURCE: J. Brider

[i] (Ellison, 1994)
[ii] Taken from McCormack, 2007

Mangaia

The second highest island in the Cook Islands, Mangaia is an ancient raised limestone island attaining a maximum elevation of 169m. The island, like others in the Cook Islands is characterised by its karst topography. Makatea substrate dominates the periphery of the island while the interior contains the volcanic core upon which the limestone reef was laid. The raised makatea traps water flowing from the volcanic peak creating vast wetland habitat before the waters eventual release into the encompassing sea. The makatea forest and enclosed volcanic terrain provides habitat for many native species including an endemic Kingfisher, the *Tangaeo* (*Todirhampus ruficollaris*). The wetland ecosystems have native freshwater eel and wild duck, commonly known as *Tuna Maori* (*Anguilla obscura*) and *Mokora Rere-vao* (*Anas superciliosa*) and provide for taro (*Colocasia esculenta*) cultivation. Native marine habitats on Mangaia are limited to fringing reef and off-shore waters.

Table 3 Native species present and breeding on and off-shore of Mangaia

Species Group	Number of Native Species Present
Fern and Fern Allies	36
Flowering Plants	107
Corals and Sponges	25
Insects	23+
Reptiles	0
Birds	13
Mammals	2

Figure 4 Wetland ecosystems, Lake Tiriara on Mangaia. SOURCE: J. Brider

Aitutaki

A unique island in the sense that it is halfway between being a volcanic island and an atoll, this "almost atoll" is characterised by a triangular ring of idyllic *motu* (islets) encasing a turquoise lagoon. Aitutaki reaches a height of 124m with a land area of 18km^2 providing coastal coconut and broadleaf forests, home to the introduced Blue Lorikeet or *Kuramoo* (*Vini peruviana*) as it is known in Aitutaki. Wetlands are present and provide habitat for freshwater eels and taro cultivation. The surrounding *motu* are nesting grounds for many seabirds including the nationally endangered *Tavake* or Red-tailed Tropicbird (*Phaethon rubricauda*). Saltwater marshes, fringing coral reef and a large lagoon compliment the marine environment, in addition to the off-shore ocean. The marshlands are dominated by *Ngangie* (*Pemphis acidulus*) and provide nursery and spawning grounds for many lagoon fish. Aitutaki has a marine hatchery which breeds *Paua* or Giant Clam (*Tridacna maxima*) for export and lagoon restocking.

Table 4 Native species present and breeding on and off-shore of Aitutaki

Species Group	Number of Native Species Present
Fern and Fern Allies	10
Flowering Plants	43
Corals and Sponges	50
Insects	34+
Reptiles	1
Birds	8
Mammals	2

Figure 5 Ridge to reef view of Aitutaki. SOURCE: J. Brider

Atiu

The first and largest of the three Ngaputoru Islands, Atiu maximum elevation is 72m. A raised limestone island with makatea forests, volcanic sloes and enclosed wetlands. The endemic *Kukupa* or Cook Islands Fruit-dove (*Ptilinopus rarotongensis*) lives in the rat free forests of Atiu while the caves within the makatea provide habitat the endemic *Kopeka* or Atiu Swiftlet (*Aerodramus sawtelli*) and native Coconut crab (*Birgus latro*) commonly known as *Kaveu*. A population of the endemic Kakerori or Rarotongan Flycatcher (Pomarea dimidiata) was established on Atiu as an "insurance policy" should the Rarotongan population decline. A population of *Kura* or Rimatara Lorikeet (*Vini kuhlii*) were relocated from Rimatara, French Polynesia to Atiu due to the island being free of Brown Rat (*Rattus norvegicus*) and Ship Rat (*R. rattus*) both known locally as *Kiore Toka*. The marine habitats, as for all raised limestone islands in the Cook Islands, is limited to fringing reef and off-shore waters. Recent efforts have been made to establish a coral garden reserve on Atiu.

Table 5 Native species present and breeding on and off-shore of Atiu

Species Group	Number of Native Species Present
Fern and Fern Allies	26
Flowering Plants	96
Corals and Sponges	11
Insects	15+
Reptiles	1
Birds	14
Mammals	1

Mauke

The second largest island of the Ngaputoru, Mauke stands at 29m with a land area of 18.4km^2. Dominated by makatea forest and topography with a volcanic core, these habitats support *Maire* (*Alyxia stellata*) production and populations of *Kaveu*. The

marine environment comprises of fringing reef and off-shore waters, of which Mauke has a *raui* in place for a portion of the lagoon ecosystem.

Table 6 Native species present and breeding on and off-shore of Mauke

Species Group	Number of Native Species Present
Fern and Fern Allies	23
Flowering Plants	79
Corals and Sponges	35
Insects	11+
Reptiles	1
Birds	17
Mammals	0

Mitiaro

The third and smallest island of the Ngaputoru at an elevation 15m, Mitiaro has makatea forest and a vast wetland lake ecosystem. The once endemic fan palm, *Iniao* (*Pritchardia mitiaroana*), survives in the makatea landscape. Recently-conducted genetic work has shown that this once endemic species has sister populations in French Polynesia. The recently discovered endemic Mitiaro Daisy (*Tetramolopium mitiaroense*) is found in strand and makatea areas. Sandalwood forests are being re-established with government assistance to support local economies. A sub-population of the introduced *Kura* to Atiu escaped and established a population on Mitiaro which appears to be thriving despite the presence of rats that are absent on Atiu. The wetland lakes, Te Roto Nui and Te Roto Iti te Pito o Kare, have considerable deposits of peat and provide habitat for wetland vegetation and birds such as the *Moomoo* or Spotless Crake (*Porzana tabuensis*) and *Tuna Maori*. The marine ecosystem contains fringing reef and off-shore waters where spawning of Flying fish or locally known as *Maroro* (*Cheilopogon* spp.) is closely monitored and protected by the Mitiaro people.

Table 7 Native species present and breeding on and off-shore of Mitiaro

Species Group	Number of Native Species Present
Fern and Fern Allies	16
Flowering Plants	89
Corals and Sponges	11
Insects	4+
Reptiles	0
Birds	9
Mammals	0

Manuae

The first of the three uninhabited islands of the Cook Islands, Manuae is under the stewardship of family landowners presiding on nearby Aitutaki. An atoll standing at 10m, the island is dominated by coconut and broadleaf forest with a periphery of coastal strand vegetation. The island provides nesting grounds for marine turtles (*Eretmochelys imbricata* and *Chelonia mydas*), known as *Onu taratara* and *Onu Kai* respectively, and Tavake. The marine ecosystem comprises of fringing and barrier reef with a large lagoon between the two atoll islets. Speculative research on Manuae hypothesises that this island may be a potential spawning source area for much of Aitutaki's invertebrate marine life.

Table 8 Native species present and breeding on and off-shore of Manuae

Species Group	Number of Native Species Present
Fern and Fern Allies	4
Flowering Plants	30
Corals and Sponges	undocumented[i]
Insects	undocumented[ii]
Reptiles	undocumented[iii]
Birds	4
Mammals	0

Figure 6 Beach and coastal forest on Manuae. SOURCE: J. Brider

Takutea

A sand cay off-shore of Atiu stands at 5m and is a significant seabird nesting area e.g. *Kotaa Nui* or Greater Frigatebird (*Fregata minor*) and the *Toroa* or Red-footed Booby (*Sula sula*), the island is protected for this reason by the Atiu Island Trust and supported by Atiu/Takutea Environment Regulations. Species of significance on Takutea include *Kena* (*Sula leucogaster*) and the *Teue* or Bristle-thighed Curlew (*Numenius tahitiensis*). The marine environment is supported with fringing reef and off-shore waters where nursing Humpback Whales or *Toora* (*Megaptera novaeangliae*) frequent.

Table 9 Native species present and breeding on and off-shore of Takutea

Species Group	Number of Native Species Present
Fern and Fern Allies	4
Flowering Plants	28
Corals and Sponges	undocumented[iv]
Insects	1+
Reptiles	0
Birds	8
Mammals	1

Palmerston

The final and northern most of the Southern Group, Palmerston is an atoll with a land area of 2km^2. The island is characterised by coastal strand vegetation which hosts

[i] Coral and sponge species lists have not been published for Manuae although several species are known to be present
[ii] Insect species lists have not been published for Manuae
[iii] Marine turtle species lists have not been published for Manuae although nesting sites have been observed on the island
[iv] Coral and sponge species lists have not been published for Takutea although several species are known to be present

nesting populations of *Tavake*, *Mokora-Rerevao*, *Rupe* or Pacific Pigeon (*Ducula pacifica*) and both species of *Onu* (Marine Turtles). The fringing and barrier reef encircle a large lagoon where Parrotfish (*Chlorurus* spp., *Hipposcarus longiceps* and *Scarus* spp.) are harvested to support local economy.

Table 10 Native species present and breeding on and off-shore of Palmerston

Species Group	Number of Native Species Present
Fern and Fern Allies	3
Flowering Plants	30
Corals and Sponges	undocumented[i]
Insects	1+
Reptiles	3
Birds	6
Mammals	0

Penrhyn

The northern-most island of the Cook Islands, Penrhyn is an atoll with meagre land area of 10km2 but an enclosed lagoon large enough to fit Rarotonga. Terrestrial habitats are restricted to coastal strand vegetation with coconut and broadleaf forest. Seabird and marine turtle nesting sites are common but the real economic wealth of Penrhyn is based in its marine habitats where introduced Black-lipped Pearl Oysters or *Parau* (*Pinctada margaritifera*) and native Spotted Pearl Oyster or *Pipi* (*Pinctada maculata*) are cultivated and contribute to national economic wealth. *Paua* were very common in the lagoon but recent stock numbers have declined drastically resulting in *raui* being established. Off-shore fisheries are located around Penrhyn which sustains national fish consumption and export revenues.

Table 11 Native species present and breeding on and off-shore of Penrhyn

Species Group	Number of Native Species Present
Fern and Fern Allies	3
Flowering Plants	30
Corals and Sponges	undocumented[ii]
Insects	2+
Reptiles	2
Birds	12
Mammals	3

Manihiki

Situated in the north, Manihiki is an atoll standing at 5m elevation, like other atolls, Manihiki is dominated by coastal strand vegetation with coconut and broadleaf forest which provide nesting grounds for seabirds and marine turtles. Manihiki has several large stands of Pandanus or *Ara-taatai* (*Pandanus tectorius*), interestingly, *Eke* or Octopus (*Octopus cyanea*) has been seen climbing *Ara-taatai* overlooking the lagoon in search of its sweet fruit. Like Penrhyn, Manihiki has a large enclosed lagoon that

[i] Coral and sponge species lists have not been published for Palmerston although several species are known to be present

[ii] Coral and sponge species lists have not been published for Penrhyn although several species are known to be present

supports the production of *Parau*, with Manihiki stocks being the largest pearl contributor to the nation's wealth. Like Penrhyn, *Paua* stocks have diminished requiring conservation action. Manihiki also has several brackish water ponds which provide habitat for *Ava* or Milkfish (*Chanos chanos*).

Table 12 Native species present and breeding on and off-shore of Manihiki

Species Group	Number of Native Species Present
Fern and Fern Allies	4
Flowering Plants	28
Corals and Sponges	1+
Insects	7+
Reptiles	1
Birds	9
Mammals	0

Rakahanga

Manihiki's sister island, Rakahanga's native habitats resemble those of Manihiki with the exception of the brackish water ponds. Terrestrial habitats are dominated by coconut and broadleaf forests with *Pukatea* (*Pisonia grandis*) and Ano (*Guettarda speciosa*) forming a large component of the vegetation. A *rahui* (*raui*) has been established on Rakahanga to protect and conserve depleted marine stocks. In times of past Rakahanga and Manihiki used to be populated by one people who use to migrate cyclically over seven years between the two islands in an effort to sustain food stocks. With the arrival of western missionaries this practice was abolished and two static populations were established on both islands

Table 13 Native species present and breeding on and off-shore of Rakahanga

Species Group	Number of Native Species Present
Fern and Fern Allies	3
Flowering Plants	28
Corals and Sponges	undocumented[i]
Insects	2+
Reptiles	undocumented[ii]
Birds	7
Mammals	0

Pukapuka

The most north-western island of the Cook Islands, Pukapuka is comprised of three large islets, with two being inhabited and the third under *rauwi* (*raui*) to supplement daily food stocks and seasonal seabird and *Kaveu* harvests. Terrestrial habitats are characterised by coastal strand vegetation with coconut and broadleaf forests. Giant native *Tamanu* (*Calophyllum inophyllum*) trees persist on the island but these are becoming fewer and fewer over time, these great trees and the forests they contribute to provide habitat for the native *Rupe*. Seabirds and marine turtles nest on the island.

[i] Coral and sponge species lists have not been published for Rakahanga although several species are known to be present

[ii] Marine turtle species lists have not been published for Rakahanga although several species are known to be present

The people of Pukapuka have developed sheltered wetlands in the center of the largest islet which sustains taro cultivation which is especially important after cyclones have ravaged coconut and banana plantations. The marine environment is comprised of barrier reef and deep lagoon ecosystems. Marine invertebrates e.g. *Paua* are scarce in the lagoon however they were abundant in the past, hypotheses for this decline include overharvesting and changes in lagoon flow due to harbour development.

Table 14 Native species present and breeding on and off-shore of Pukapuka

Species Group	Number of Native Species Present
Fern and Fern Allies	3
Flowering Plants	32
Corals and Sponges	undocumented[i]
Insects	31+
Reptiles	1
Birds	15
Mammals	1

Nassau

Neighbouring Pukapuka, Nassau is a small sand cay with coastal strand vegetation and coconut woodlands. Terrestrial species of significance include the *Kaveu*, nesting seabirds and marine turtles. No significant marine ecosystems have been identified for Nassau but fringing reef and surrounding ocean waters exist which have sustained the population. Off shore of Nassau is the Tema Reef, an isolated reef ecosystem which supports many species of marine fish and invertebrates

Table 15 Native species present and breeding on and off-shore of Nassau

Species Group	Number of Native Species Present
Fern and Fern Allies	3
Flowering Plants	24
Corals and Sponges	undocumented[ii]
Insects	undocumented[iii]
Reptiles	undocumented[iv]
Birds	4
Mammals	0

Suwarrow

The final uninhabited island and only National Park in the Cook Islands, Suwarrow is an atoll with small land area of 0.4km^2, comparatively the enclosed lagoon is many magnitudes larger. Suwarrow hosts large populations of native breeding and migratory species including the *Teue*. The island host 9% of the world's populations of Lesser Frigatebird or *Kotaa Iti* (*Fregata ariel*), *Tavake* (3% of world population)

[i] Coral and sponge species lists have not been published for Pukapuka although several species are known to be present
[ii] Coral and sponge species lists have not been published for Nassau although several species are known to be present
[iii] Insect species lists have not been published for Nassau although several species are known to be present
[iv] Reptile species lists have not been published for Nassau although several species are known to be present

and the Cook Islands only large colony of *Tara* or Sooty Terns (*Sterna fuscata*). The enclosed lagoon provides habitat for *Pipi*, various species of reef shark and nursing Humpback Whales.

Table 16 Native species present and breeding on and off-shore of Suwarrow

Species Group	Number of Native Species Present
Fern and Fern Allies	2
Flowering Plants	24
Corals and Sponges	undocumented[i]
Insects	1+
Reptiles	2
Birds	11
Mammals	2

Figure 7 Atoll environments of Suwarrow. SOURCE: NES (Suwarrow)

Migratory Species

In addition to hosting year-round species, the Cook Islands provides habitat for several migratory species. Species of importance includes *Onu Kai*, *Teue*, *Karavia* or Long-tailed Cuckoo (*Eudynamis taitensis*) and Humpback Whale. The Wandering Tattler or *Kuriri* (*Tringa incana*) leaves the Cook Islands in early April to undertake a non-stop 9,000km journey to Alaska. As the arctic summer comes to an end, the Tattlers return to the Cook Islands by mid-September. Humpback whales migrate to the Cook Islands in mid October to calve and nurse before returning to Antarctic waters to feed[ii].

Table 17 Migratory species that visit the Cook Islands to either breed or feed throughout the year[iii]

Scientific name	Common name
Anguilla marmorata	Giant Longfin Eel
Anguilla megastoma	Pacific Longfin Eel
Anguilla obscura	Pacific Shortfin Eel
Kutsuwonus pelamis	Skipjack Tuna
Thunnus spp.	Albacore, Yellowfin, Bigeye
Caretta caretta	Loggerhead Turtle
Chelonia mydas	Green Turtle
Eretmochelys imbricata	Hawksbill Turtle
Pluvialis fulva	Pacific Golden-Plover
Limosa lapponica	Bar-tailed Godwit

[i] Coral and sponge species lists have not been published for Suwarrow although several species are known to be present
[ii] (McCormack, 2002)
[iii] (McCormack, 2007)

Numenius tahitiensis	Bristle-thighed Curlew
Tringa incana	Wandering Tattler
Eudynamis taitensis	Long-tailed Cuckoo
Megaptera novaeangliae	Humpback Whale

Figure 8 Cook Island migratory species. Clockwise from top Giant longfin eel, Long-tailed Cuckoo, Bristle-thighed Curlew, Green Turtle, Pacific Golden-Plover, Wandering Tattler (breeding (R) and non-breeding (L) plumage), Humpback Whale and Bar-tailed Godwit. SOURCE: McCormack, 2007

1.2.3 Off-Shore Fisheries

Although a young industry, the Cook Islands off-shore fisheries industry has developed in leaps and bounds and is the second largest contributor to the economy after tourism in the Cook Islands. *Toevere* or Albacore (*Thunnus alalunga*) from the Northern Group waters made up 76% of total catch in 2009 and this was followed by *Aai* orYellowfin Tuna (*T. albacares*). *Toevere* is unloaded at canneries in Pago Pago, American Samoa and has an estimated market value of USD$12.3 million dollars. Other exports in 2009 amounted to 9.38 metric tonnes, with 87% of this destined for the Japanese market and the remainder sent to the US[i]. Box 1 is a summary report taken from the Ministry of Marine Resources National Fisheries Report 2009.

Box 1. Cook Islands Longline Fisheries

Characteristics

The Cook Islands pelagic longline fisheries are characterized by four sub-fleets. The first two sub-fleets operate within the vicinity of the Cook Islands Exclusive Economic Zone. Vessels in the southern Cook Islands fishery, based out of Rarotonga are small scale vessels (below 20m LOA[i] and 80 GRT[ii]), carrying out fresh fish operations to cater for domestic and international markets (NZ, Japan, USA). These vessels set shallow and target species are tuna and swordfish, however all bycatch species are also valuable for sale on the local market. Vessels operating in the northern fishery are based out of Pago Pago, American Samoa and concentrate fishing activities in the northern zone of the Cook Islands EEZ, targeting albacore for canning. The other two sub-fleets operate within the WCPFC either in both areas of other national jurisdictions and high seas, or just the high seas.

The Cook Islands troll fleet has slowly diminished over the years, and since 2007 has only had one remaining troll vessel actively fishing within the WCPFC-CA[iii].

Policy and Regulation

In the year 2000 the Cook Islands Government enforced a policy which discontinued the licensing of foreign fishing vessels, designed to promote the development of local commercial fishing operations. This saw rapid growth in the industry of the southern fishery in the years 2002 to 2004. In mid-2008 this policy was reverted to again allow foreign fishing vessels access to fish within the Cook Islands EEZ. During this interim period where the new policy was implemented, all fishing license applications (for the northern fishery) were on hold and contribute to the lower total catches for 2008, seen in table 18.

Year	ALB	BET	YFT	SKL	PBF	BUM	BLM	MLS	SWO	OTH	Totals
2004	1889.6	408.1	520.2	80.2	1.4	136.7	10.3	39.0	151.9	264.1	3501.5
2005	2368.8	216.0	409.8	32.5	1.4	138.9	8.1	42.0	89.5	218.0	3525.2
2006	2657.2	188.8	301.3	71.2	0.0	28.3	9.1	14.9	89.9	186.9	3547.5
2007	2630.4	233.6	277.5	34.3	0.0	41.1	16.8	13.3	43.6	109.2	3399.7
2008	1904.9	244.0	228.5	39.2	0.0	23.5	15.8	11.1	19.6	115.3	2601.9

Table 18 Annual Target Species Catch in the WCPFC-CA 2004-2008, catch weights in metric tonnes

The Marine Resources Longline Fishery Regulations 2008 stipulates an effort limit of 40 fishing licenses for the Cook Islands EEZ, with a total catch limit of 4,000mt in any consecutive four quarter period. The Marine Resources Longline Fishery Regulations 2008 will be reviewed biennially with input from other Government agencies and fishery stakeholders.

i length of all, ii gross registered tonnage
iii Western and Central Pacific Fisheries Commission Convention Area

[i] (Ministry of Marine Resources, 2009a; 2009b; 2010)

Fleet Composition and Distribution

Fleet composition fluctuates from year to year, especially in the southern fishery. Due to its geography and the influence of climatic conditions on catch rates, the southern fishery has been characterized as a boom-bust fishery. The fleet in the northern fishery has remained relatively stable with a few vessels venturing south, experimenting with fishing activities in the north and unloading in Rarotonga. However, these exercises have not been fruitful due to the high costs associated with obtaining fuel and supplies from Rarotonga.

The majority of the Cook Islands fishing vessels concentrate operations in the northern part of the Cook Islands EEZ. However, a few vessels based out of Suva fish in other areas of the WCPO beyond Cook Islands waters as seen in figure 9.

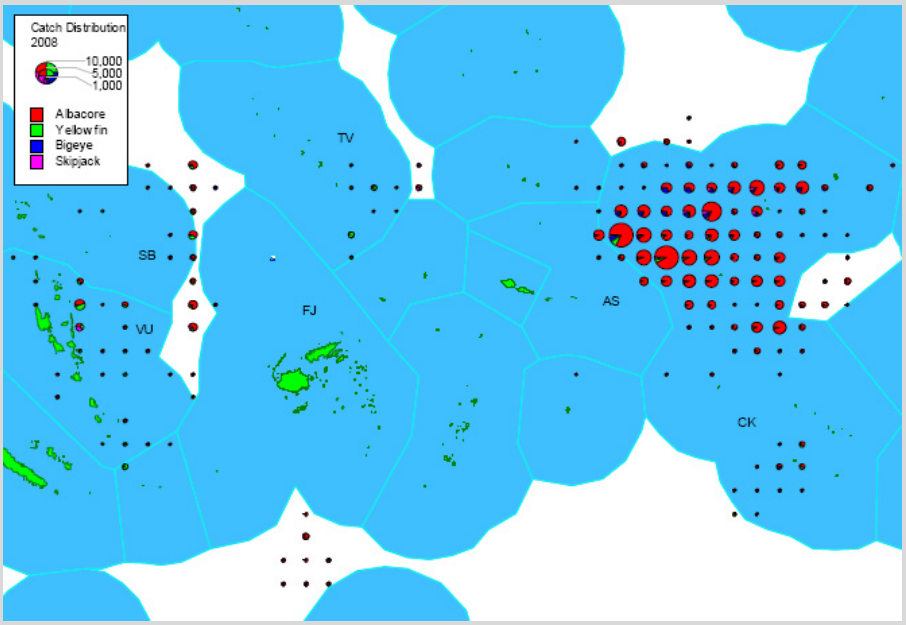


Figure 9 Catch Distribution for the Cook Islands National Fleet, 2008

Non-target Species Composition

Wahoo makes up almost 46% of reported non-target species catches, whilst mahi-mahi contributes to 11.5% of this catch. The shark group contributes to 30.7% and moonfish contributes 5.4% of total non-target species catches.

Useful Information

Operating fishing activities out of Rarotonga has always been a costly exercise. Rarotonga's location, accessibility to markets, necessary supplies and services has always proved expensive for fishing companies. In recent months the local fleet (based in Rarotonga) has diminished, with companies selling off fishing boats, and other components of their companies i.e. processing facilities. Catch rates have not been high enough to sustain local companies operating out of Rarotonga; this coupled with the increase in fuel costs in recent years has played a big role in the demise of small scale fishing vessel operations.

Since the implementation of the new licensing policy in 2008 and the introduction of the Marine Resources Longline Fishery Regulations, some vessels operating in the northern fishery have kept some catch to unload in Rarotonga to either sell on the local market or to export. Species such as small yellowfin and bigeye, wahoo, mahi-mahi and marlins have been unloaded.

1.2.4 The Cook Islands Biodiversity Database

The Cook Islands Biodiversity database is a concise online multimedia collection of all known Cook Island species, designed to eventually include the country's entire biodiversity. The database currently contains 4500 records with 2500 of those records including standardized images to aid recognition. Box 2 is a case study of the Cook Islands Biodiversity Database.

Box 2. Cook Islands Biodiversity Database

This is a case study summary of the Cook Islands Biodiversity Database with information provided by Gerald McCormack, Director, Cook Islands Natural Heritage Trust

Background

The Cook Islands multimedia biodiversity database has been online since 2003, and it presently has information on 4,500 existing species, native and introduced, including 2,500 with photographs to aid recognition. Well known groups, such as birds, lizards, fishes, flowering plants and ferns are essentially complete. The database increasingly fulfils the Cook Islands' commitment to develop inventories of its biodiversity, as required under Article 7 of the CBD.

The database and website

The database development has three goals:

(1) To record in a single database all local plants and animals with images and key identification features;

(2) To record relevant traditional and scientific knowledge; and

(3) To make this information available to the public to facilitate awareness and communication.

This approach had three proposed advantages:

(1) The public would need to master only one system of information retrieval and presentation;

(2) Multi-taxon groupings, such as all endemics or invasives of an island, would be in the same system; and,

(3) Popular groups, such as birds, fishes, and ornamental flowers, would help to carry and open the door to less popular groups, such as insects, echinoderms, and ferns.

The database has three basic components of the front-end interface, which are:

(A) the **Search Page** allows the user to find a species by typing in the first part of one of its names in Latin, English or Maori. The species are arranged in a hierarchical system of taxonomy and the names of higher taxa or ranks such as *Cocos nucifera* or coconut are also searchable. Multiple names can be input with semicolon separators to find multiple species or higher taxa and allow for spelling uncertainties. Although Cook Islands Maori is often written with standard letters only, there is a character input to enable searches using modern orthography with macron-vowels (ĀĒĪŌŪ āēīōū) for long-vowels and the left-single apostrophe (ʻ) for a glottal stop, as in kūkupa and ʻavaʻava

To find an unknown animal the user can search for the group to which it belongs. This works well for well-known groups (such as butterfly, grouper or mammal) but it works poorly for larger taxa not easily divided into sub-groups, such as the 1200 local flowering plants. In the future, a system to find species by easily observed features, such as leaf shape and flower colour, will be developed so uses with specimen-in-hand can find images of likely candidates.

While searching for species according to their taxonomy is fundamental the database is designed to find groups of species based on a wide-range of biological and social criteria. Advanced search criteria menus enable the user to search for trans-taxonomic groups based on such features as endemicity, invasiveness, medicinal usefulness, habitat, distribution, threatened status or biosecurity significance.

(B) the **Results Page**, the default results page has thumbnail images to facilitate direct visual recognition. The zoom system allows the user to zoom several different thumbnails for more detailed comparison.

On the right of the results page are more display options as well as vernacular names used by the various islands in the Cook Islands. The database records and maintains these differences between island dialects e.g. on the Rarotonga the White-tailed tropicbird is the Rākoa while on other islands it the *Pīrake*, *Pirake* or *Tavake Mokomoko*.

An alternate results page consists of one line of text per species to provide a concise list. The list includes the scientific, English and the national Maori names along with the family name and a concise English descriptor such as wasp, fern or seaweed. The group-descriptor is particularly useful for interpreting the diverse taxa found using the advanced search criteria menus.

(C) the **Species Page** accessed by clicking the species name on the results page displays all the information available for a particular species. The lack of available biologists to input data has meant that species data is often inadequate. The primary drive has been to tabulate data on the social and biological significance to enable the advanced search criteria menus to find groups of special interest. The other species page priority after the standard primary image has been to list key identification features. There is also a distribution map showing known presence and known absence by island and although this data is reasonably comprehensive for the larger or otherwise conspicuous terrestrial species it is woefully inadequate for many groups. There is still an immense amount of basic fieldwork required on Cook Islands Biodiversity.

Accessibility.

Using the online database is dependent on students and the general public having access to computers and the internet. All schools now have a computer room, and computers are becoming more common with the general public. Internet access is also becoming more widespread and affordable, although the slow connections and high costs within the Cook Islands continue to be an obstacle to browsing a complex multimedia database on the Internet. To meet this challenge the website and database are also available on a dynamic CD provided free to local schools.

Challenges.

The basic challenge is to find and photograph the 2,000 species already recorded but lacking photographs; and then to find, identify, and photograph the estimated 3,000 local species that are not yet recorded in the database.

Although the present online database is a remarkable achievement for a small island developing state (SIDS), a decision was made in 2007 to correct an underlying flaw in the data structure, to move to open source software, and to make the database online editable. This undertaking has been especially challenging because of a lack of funding and a dependence on volunteer programmers. As a result, although the original database remains online, it has been closed for data updates since mid-2007. Since then, there has been a considerable amount of research and new data collected by ministries and researchers, which has not been included in the database. It is hoped that the new Cook Islands biodiversity database will be online for the public in early 2011 – and then the real work of adding this and other data can continue. With online editing more people will be able to assist as

registered editors, or by uploading information and images through a moderation system.

Original database: http://cookislands.bishopmuseum.org/search.asp
Emerging: http://cookislands.pacificbiodiversity.net/cibed/dbs/search.html
A 2010 online article on the database is:
http://ictupdate.cta.int/en/Feature-Articles/A-base-for-biodiversity-data

1.2.5 Endemic and threatened species.

Despite the depauperate biodiversity, and no doubt due to the isolation of the islands, the Cook Islands have a number of endemic species of plants and animals. Details on these can be found on the Cook Islands Biodiversity Database 2007 (http://cookislands.bishopmuseum.org). The Cook Islands NBSAP, drawing information from the Cook Islands Biodiversity database, records 24 endemic flowering plants and 7 endemic ferns. Within the last hundred years the Cook Islands has lost one endemic flowering plant, the Rarotonga Acalypha (*Acalypha wilderi*). There are also several other recently extirpated species such as the One-leaf Orchid (*Liparis clypeolum*) and the Polynesian Pilea (*Pilea bisepala*). Several endemics are rare or survive in restricted habitats, such as *Kopeka*, Te Manga Cyrtandra (*Cyrtandra lillianae*) and the Rough Tree-fern or *Panga Tua-taratara* (*Cyathea parksiae*).

Because there are so few of them, the birds of the Cooks Islands are particularly well researched in comparison with other taxonomic groups. The Southern group supports 11 indigenous land birds, four of which are endemic to single islands and two endemics are found on two islands with the remaining five being multi-island non endemics[i]. All of the endemic birds are on the IUCN Red List of Threatened Species.

In addition to the native land birds, four introduced species have naturalized via intentional and accidental introduction - the Jungle fowl (*Gallus gallus*), Blue Lorikeet, the Myna (*Acridotheres tristis*) birds, and the Chestnut-breasted Mannikin *(Lonchura castaneothorax)*. The potential threats from these species are understudied but current indications suggest that there is little interaction between these species and native bird species. The Jungle Myna (*Acridotheres fuscus*) has also recently been recorded on Rarotonga[ii], and its status is yet to be determined.

The sand cay island of Takutea supports nationally significant seabird colonies such as the *Kotaa Nui* and the *Toroa*. A number of migratory seabirds frequent the Cook Islands including the *Teue*, which is listed in the IUCN Red List of Vulnerable Species.

The low-lying islands of the northern Cook Islands support mainly seabirds. They have only one resident land bird – the *Rupe* on the island of Manihiki, Palmerston and Pukapuka[i]. Suwarrow atoll is an important sea-bird breeding site not only for the Cook Islands but also for the region. Eleven species of seabirds breed on the island. It supports regionally significant colonies of *Kotaa Iti* (9% of world population), *Tavake* (3% of world population) and the Cook Islands only large colony of *Tara* [iii].

Once among the rarest birds of the world, the endangered *Kakerori* has been brought back from the brink of extinction. From 29 birds in 1989 to over 300 birds in 2010, the recovery of this species has been a major success, moving from Critically

[i] (McCormack, 1997)
[ii] (McCormack, 2009)
[iii] (McCormack, 2007)

Endangered to Endangered on the IUCN Red List. A brief history of the *Kakerori* recovery programme is provided for in Box 3. The survival of the species is still dependent on a continuation of intensive conservation efforts, but if present trends continue, it will eventually require down listing to Vulnerable on the IUCN Red List.

In 2007, 27 *Kura*, classified by IUCN as endangered, were re-established on the island of Atiu. Fossil records show that this bird had previously been present in the southern Cook Islands, and probably became extinct prior to 1820[i]. Their numbers on Atiu are are now reported to be more than 80[ii].

Box 3. The Rarotonga flycatcher (Kakerori) Pomarea dimidiata recovery programme

Summarised from report in DOC Research & Development Series 296[iii]

Figure 10 Kakerori. SOURCE: http://www.islands.com/article/Blue-List-Voluntourism

A review of the bird conservation problems in the South Pacific was commissioned by SPREP and the International Council for Bird Preservation in the early 1980s. This review identified the kakerori, or Rarotonga flycatcher (*Pomarea dimidiata*), as one of the species most urgently in need of conservation management. This small flycatcher, which is endemic to Rarotonga, was classified as 'critically endangered' in 1989 under the IUCN classification system. At that time the population had declined to just 29 birds, largely due to ship rats raiding the kakerori nests. It was predicted that, with no intervention, the kakerori would be extinct by 1999. With assistance from the New Zealand Department of Scientific and Industrial Research (DSIR), a draft recovery plan was prepared and adopted by the Cook Islands Conservation Service (CICS), in July 1988. The plan was initially implemented by the New Zealand Department of Conservation (DOC), the CICS and the Secretariat for the Pacific Regional Environment Programme (SPREP). The basis of the plan was an intensive programme of rat poisoning and nest protection that began in spring1989.

The majority of kakerori inhabit the valleys of a 155 ha area of forest in the district of Takitumu, in southern Rarotonga. The recovery programme received a major boost when this area was included in the South Pacific Biodiversity Conservation Programme, a regional project funded by the Global Environment Facility and executed through the South Pacific Regional Environment Programme (SPREP). Under this project, management of the area, including the conservation of the kakerori, was passed from the Government's National Environment Service (the former Cook Islands Conservation Service) to the Takitumu Conservation Area Committee. This committee consists of representatives from the 3 major landowning families of the Takitumu Conservation Area. The aim of the project is to manage the area for conservation purposes, and also to generate income from eco-tourism for the local

[i] (McCormack, 2007)
[ii] (George Matearíki, pers comm., 2010)
[iii] (Robertson & E. K. Saul, 2008)

landowners.

The kakerori recovery programme enjoyed considerable success in the first 10 years, and by 2001 the population had recovered to 255 birds. The focus then moved from "species recovery" to a less intensive programme of "sustainable management", with the objective being to keep the Rarotonga population above 250 birds. In order to ensure the species survived, an "insurance population" was established on Atiu, with 30 birds transferred to this ship rat free island over a 3 year period. The population continued to increase annually, until 2006. With 5 cyclones passing through the southern Cook Islands over a 5 week period in the summer 2005, the trend of increasing population suffered a setback. Though direct mortality was less than expected, a very poor breeding season followed and in August 2006 the population was estimated at 291 individuals; 255 on Rarotonga and 36 on Atiu.

As numbers continue to increase, absolute counts are becoming more difficult. At the last census conducted in 2009 there were 330 birds on Rarotonga (H. Robertson, pers comm.) On Atiu, the latest report puts the population there at 93 (E. Saul, pers comm.).

The Cook Islands have twelve small deep-sea fish that are endemic[i] and occasionally collected for the marine ornamental trade[ii]. The endemics of other animal groups, such as insects, spiders and landsnails have been poorly researched. However, we do know that on Rarotonga 14 of 26 endemic landsnails have become extinct in the last 130 years[iii].

Rarotonga, the highest island in the group at more than 650m, has more than 150 native flowering plant species, 18 of which are endemic species. The raised makatea islands of Mangaia, Mauke, Mitiaro and Atiu have 124 species of native flowering plants and 1 to 6 endemic species on each island. Aitutaki, an almost atoll, has 44 native flowering plant species and 45 native flowering plants found in the Northern atoll islands[i].

Bodies of freshwater in the Cook Islands are extremely limited, with no large lakes or rivers, only wetlands, streams and a few small freshwater lakes present. Freshwater biodiversity is therefore extremely limited. The Cook Islands NBSAP lists only nine native and four introduced fish species, two native and three introduced gastropods, and six native and one introduced crustacean. A recent survey of freshwater habitats on Rarotonga in July 2010 has resulted in an increase of the recorded freshwater biodiversity.

Tables 19 and 20 lists the endemic species present in the Cook Islands and highlights those considered nationally as endangered. Table 21 and 22 lists the nationally endangered native species, excluding the endemic species, these tables have been extracted the Cook Islands Biodiversity Database[i], while Tables 23 and 24 lists alien invasive species and highlights those considered being of serious concern as identified in the consultation workshop for the development of the NBSAP document. To conclude this section Box 4 presents snapshot of the number of species in the Cook Islands documented in the 2008 IUCN Red List.

[i] (McCormack, 2007)
[ii] (Passfield, pers obs.)
[iii] (Brook, 2010; Brook, Walter, & Graig, 2010; Lee et al., 2007; McCormack, 2007)

Table 19 Endemic plants present in the Cook Islands (Species considered threatened are **printed in bold type)**

Plants			
Type	**Scientific Name**	**Common Name**	**Islands Present**
Fern	***Phymatosorus katuii***	**Cook Islands Oak-leaf Fern**	**4**
Fern	***Acrophorus raiateensis***	**Rarotonga Acrophorus**	**1**
Grass	***Garnotia cheesemanii***	**Rarotonga Garnotia-Grass**	**1**
Herb	***Lepidium sp.* (undescribed)**	**Mitiaro Peppergrass**	**1**
Herb	***Balanophora wilderi***	**Rarotonga Balanophora**	**1**
Herb	***Habenaria amplifolia***	**Rarotonga Ground-Orchid**	**1**
Palm	***Pritchardia mitiaroana***	**Mitiaro Fan-Palm**	**1**
Shrub	***Haloragis sp.* (undescribed)**	**Rarotonga Haloragis**	**1**
Shrub	***Cyrtandra lillianae***	**Te Manga Cyrtandra**	**1**
Shrub	***Cyrtandra rarotongensis***	**Rarotonga Cyrtandra**	**1**
Shrub	***Cyrtandra lillianae***	**Te Manga Cyrtandra**	**1**
Shrub	***Cyrtandra rarotongensis***	**Rarotonga Cyrtandra**	**1**
Shrub	***Sclerotheca viridiflora***	**Rarotonga Sclerotheca**	**1**
Moss	*Moenkemeyera rarotongae*	Rarotonga Moenkemeyera	1
Moss	*Spiridens armatus*	Moss	1
Fern	*Grammitis cheesemanii*	Cloud Grass-fern	1
Fern	*Hymenophyllum involucratum*	Rarotonga Filmy-fern	1
Fern	*Cyathea parksiae*	Rough Tree-fern	1
Fern	*Pseudophegopteris paludosa*	Mist Thelypterid	1?
Fern	*Asplenium parksii*	Parks' Asplenium	1?
Herb	*Peperomia rhomboidea*	Cook Islands Peperomia	2
Herb	*Peperomia wilderi*	Rarotonga Peperomia	1
Shrub	*Geniostoma rarotongensis*	Rarotonga Geniostoma	1
Shrub	*Geniostoma sykesii*	Makatea Geniostoma	2
Shrub	*Myoporum wilderi*	Cook Islands Myoporum	2
Shrub	*Psychotria whistleri*	Rarotonga Psychotria	1
Tree	*Homalium acuminatum*	Cook Islands Homalium	2
Tree	*Myrsine cheesemanii*	Cook Islands Myrsine	4
Tree	*Pittosporum rarotongense*	Cook Islands Pittosporum	4
Tree	*Meryta pauciflora*	Rarotonga Meryta	1
Tree	*Coprosma laevigata*	Rarotonga Coprosma	1
Tree	*Fitchia speciosa*	Rarotonga Fitchia	1
Tree	*Pandanus arapepe*	Ngaputoru Pandanus	2

Table 20 Endemic animals present in the Cook Islands (Species considered threatened are **printed in bold type)**

Animals			
Type	**Scientific Name**	**Common Name**	**Islands Present**
Bird	***Pomarea dimidiata***	**Rarotongan Flycatcher**	**2**
Bird	***Aplonis cinerascens***	**Rarotongan Starling**	**1**
Bird	***Ptilinopus rarotongensis***	**Cook Islands Fruit Dove**	**2**
Bird	***Collocalia sawtelli***	**Atiu Swiftlet**	**1**
Bird	***Todiramphus ruficollaris***	**Mangaian Kingfisher**	**1**
Bird	***Acrocephalus kerearako***	**Cook Islands Reed Warbler**	**2**
Landsnails	***Tekoulina pricei***	**Te-Kou Landsnail**	**1**
Landsnails	***Partula assimilis***	**Rarotonga Partula**	**1**
Spider	***Paratheuma andromeda***		**?**
Brittle star	*Asterostegus maini*	Cook Island Brittlestar	1?
Fish	*Centropyge boyle*	Peppermint Angelfish	1
Fish	*Centropyge narcosis*	Narcosis Angelfish	1

Fish	*Photoplepharon rosenblatti*	Cook Islands Flashlight Fish	1
Fish	*Pseudanthias priviterae*	Fairy Basslet	1
Fish	*Powellichthys ventriosus*	Powells False Moray	1?
Fish	*Belonoperca pylei*	Orange Spotted Soapfish	1?
Fish	*Cirrhilabrus claire*	Claire's Wrasse	1?
Fish	*Parapercis sp.* (undescribed)	Deep Sea Sandperch	1?
Fish	*Cirrhilabrus sp.* (undescribed)	None	1?
Fish	*Pseudocheilinus ocellatus*	None	1?
Fish	*Malacanthus sp.* (undescribed)	None	1?
Fruitfly	*Bactrocera melanotus*	Cook Islands Fruitfly	?
Landsnails	*Orobophana flavescens*	Yellow Necklace-Shell	?
Landsnails	*Orobophana parvula*	Brown Necklace-Shell	?
Landsnails	*Libera fratercula*	None	1
Landsnails	*Mautodontha imperforata*	None	1
Landsnails	*Mautodontha rarotongensis*	None	1
Landsnails	*Minidonta rotellina*	None	1
Landsnails	*Sinployea andrewi*	None	1
Landsnails	*Sinplovea atiensis*	None	?
Landsnails	*Sinplovea avanaensis*	None	1
Landsnails	*Sinployea peasei*	None	1
Spider	*Paratheuma ramseyae*	None	?

Table 21 Seriously national endangered native plant species (excluding endemic species)

Plants		
Type	**Scientific Name**	**Common Name**
Fern	*Ophioglossum nudicaule*	Adder's-tongue Fern
Fern	*Ophioglossum reticulatum*	Stalked Adder's-tongue Fern
Fern	*Cheilanthes concolor*	Cheilanthes Fern
Fern	*Antrophyum plantagineum*	Antrophyum Fern
Fern	*Hypolepis dicksonioides*	Cloud Ground-Fern
Grass	*Cenchrus calyculatus*	Native Burr-Grass
Herb	*Liparis clypeolum*	One-leaf Orchid
Herb	*Peristylus minimiflorus*	Peristylus Orchid
Sedge	*Gahnia aspera*	Dark-flower Sedge
Sedge	*Isolepis nodosa*	Leafless Sedge
Shrub	*Santalum insulare*	Polynesian Sandalwood
Shrub	*Gossypium hirsutum* var. *taitense*	Upland Cotton
Tree	*Trema cannabina*	Trema
Tree	*Terminalia samoensis*	Samoan Tropical-Almond
Tree	*Homalanthus nutans*	Southsea Homalanthus
Tree	*Alphitonia zizyphoides*	Alphitonia
Vine	*Cocculus orbiculatus*	Cocculus Vine
Vine	*Ventilago vitiensis*	Ventilago Vine

Table 22 Seriously national endangered native animal species (excluding endemic species)

Animals		
Type	**Scientific Name**	**Common Name**
Crab	*Scylla serrata*	Mangrove Crab
Fish	*Carcharinus longimanus*	Oceanic Whitetip Shark
Fish	*Cheilinus undulatus*	Humphead Wrasse
Fish	*Epinephalus lanceolatus*	Giant Grouper
Fish	*Nebrius ferrugineus*	Tawny Nurse Shark
Fish	*Negaprion acutidens*	Sicklefin Lemon Shark
Fish	*Rhinocodon typus*	Whale Shark
Fish	*Taeniura meyeni*	Blotched Fantail Ray
Fish	*Thunnus obesus*	Bigeye Tuna
Freshwater snail	*Neritina porcata*	Snail

Landbird	*Porzana tabuensis*	Spotless Crake
Migrant Bird	*Numenius tahitiensis*	Bristle-thighed Curlew
Seabird	*Pterodroma brevipes*	Collared Petrel
Seabird	*Pterodroma neglecta*	Kermadec Petrel
Seabird	*Pterodroma nigripennis*	Black-winged Petrel
Seabird	*Puffinus lhierminieri*	Audubon's Shearwater
Seabird	*Puffinus pacificus*	Wedge-tailed Shearwater
Seabird	*Sula dactylatra*	Masked Booby
Seabird	*Sterna lunata*	Spectacled Tern
Seabird	*Sterna sumatrana*	Black-naped Tern
Seabird	*Procelsterna cerulea*	Blue-grey Noddy
Turtle	*Caretta caretta*	Loggerhead Turtle
Turtle	*Chelonia mydas*	Green Turtle
Turtle	*Eretmochelys imbricata*	Hawksbill Turtle

Table 23 Community identified invasive plant species (Species considered most serious are **printed in bold type)**[i]

Plants			
Type	**Scientific name**	**Common name**	**Islands present**
Creeper	***Cardiospermum grandiflorum***	**Balloon Vine**	**1**
Creeper	***Mimosa pudica***	**Sensitive Weed**	**3**
Creeper	***Mimosa invisa***	**Giant Sensitive Weed**	**1**
Creeper	***Mikania micrantha***	**Mile-a-minute**	**3**
Shrub	***Lantana camara***	**Lantana**	**5**
Tree	***Syzygium cumini***	**Java Plum**	**2**
Creeper	*Derris malaccensis*	Derris	6
Creeper	*Centrosema pubescens*	Centro Vine	1
Creeper	*Merremia peltata*	Peltate Morning-glory	1
Fig	*Ficus benjamina*	Benjamin Fig	1
Grass	*Sorghum bicolor*	Grain Sorghum	4
Grass	*Cenchrus echinatus*	Burr Grass	5
Grass	*Elephantopus spicatus*	False Elephant's Foot	3
Grass	*Elephantopus mollis*	Elephant's Foot	5
Grass	*Paspalum conjugatum*	T-Grass	2
Grass	*Brachiaria mutica*	Para Grass	2
Grass	*Panicum maximum*	Guinea Grass	1
Grass	*Chrysopogon aciculatus*	Cling Grass	2
Grass	*Cyperus rotundus*	Nut Sedge/Grass	3
Grass	*Eleusine indica*	Wiregrass	1
Grass	*Sporobolus pyramidallis*	Tall Smut-Grass	1
Plant	*Bidens pilosa*	Beggar's stick	3
Plant	*Solanum capsicoides*	Spiny Necklace-Berry	1
Plant	*Xanthium purgens*	Cockleburr	1
Plant	*Desmodium incanum*	Spanish Clover	2
Plant	*Ruellia prostrate*	Creeping Ruella	1
Plant	*Indigofera Suffruiticosa*	Indigo	2
Plant	*Pueraria phaseoloides*	Tropical Kudzu	2
Plant	*Senna obtusifolia*	Sickle Pod	1
Plant	*Syngonium augustatum*	Leaflet Taro-Vine	1
Plant	*Cassytha Filiformis*	Cassytha	1
Plant	*Capparis cordifolia*	Capparis	1
Plant	*Canna indica*	Red Canna	1
Plant	*Cuscuta campestris*	Dodder	1
Plant	*Caesalpinia major*	Yellow Nicker	1
Plant	*Fimbristylis cymosa*	Sand Bulrush	1

[i] (McCormack, 2002)

Tree	*Hibiscus tiliaceus*	Tree Hibicus	6
Weed	*Stachytarpheta urticaefolia*	Blue Rat's Tail	6
Weed	*Sida rhombifolia*	Broom weed	3
Weed	*Phyllostachys nigra*	Black Bamboo	1

Table 24 Community identified invasive animal species (Species considered most serious are **printed in bold type**)[i]

Animals			
Type	***Scientific name***	**Common name**	**Islands Present**
Starfish	***Acanthaster planci***	**Crown-of-thorns**	**7**
Insect	*Aedes polynesiensis*	Polynesian Mosquito	15
Insect	*Aedes aegypti*	Egyptian Mosquito	1
Mammal	*Rattus rattus*	Ship Rat	3?
Mammal	*Rattus exulans*	Pacific Rat	15
Insect	*Periplaneta ameicana*	American Cockroach	3?
Arthropod	*Scolopendra subspinipes*	Brown Centipede	3?
Arthropod	*Trigoniulus species*	Purple Millipede	3?
Bird	*Acridotheres tristis*	Common Myna	4?
Fly	*Musca domestica*	Housefly	12?
Fly	*Chrysomya megacephala*	Blowfly	2?
Fruitfly	*Bactrocera xanthodes*	Pacific Fruitfly	1?
Fruitfly	*Bactrocera melanotus*	Cook Islands Fruitfly	1?
Fly	*Aleurodiscus dispersus*	Spiraling Whitefly	2?
Insect	*Culicoides belkini*	No-see-'em Sandfly	3
Insect	*Drosophilidae* (undescribed)	Vinegar Fly	1?
Insect	*Polistes olivaceus*	Yellow Paper-Hornet	3?
Jellyfish	*Physalia utriculus*	Portuguese Man-o-War	1?
Insect	*Epilachna vigintiuctopunctata*	28 spot Ladybird	2?
Insect	*Agonoxena pyrogramma*	Coconut Flatmoth	3?
Insect	*Graeffea crouanii*	Coconut Stick insect	15
Insect	*Adoretus versutus*	Rose Beetle	2?

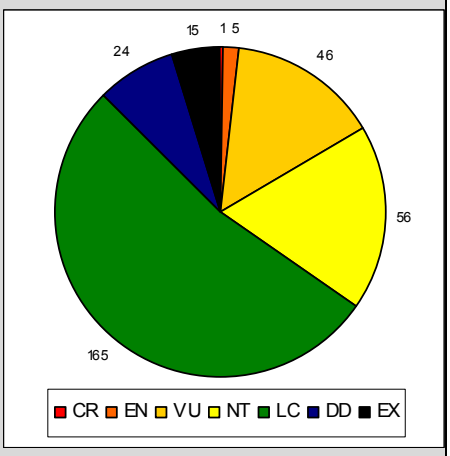
Figure 11 Collage of the most serious alien invasive species and seriously endangered native species. Clockwise from the top: Balloon Vine, Rarotonga Partula, Black-winged Petrel, Te Manga Cyrtandra, Crown-of-thorns Starfish and Pacific Rat. Species on the left are considered invasive and those on the right are endangered. SOURCE: McCormack 2007

[i] (McCormack, 2002)

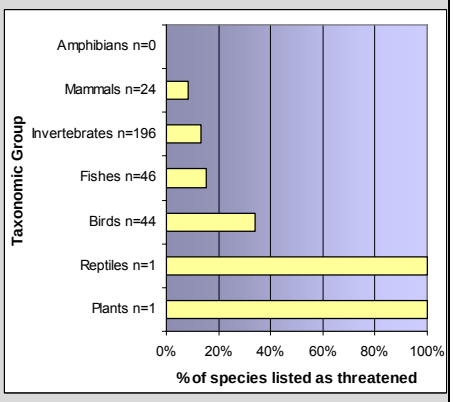
Box 4. Information from IUCN Red List for Cook Islands

This summary table and figures below provides a snapshot of the number of species in the Cook Islands documented in the 2008 IUCN Red List. Source: Summarised by IUCN Regional Office for Oceania from the IUCN Redlist 2008[i].

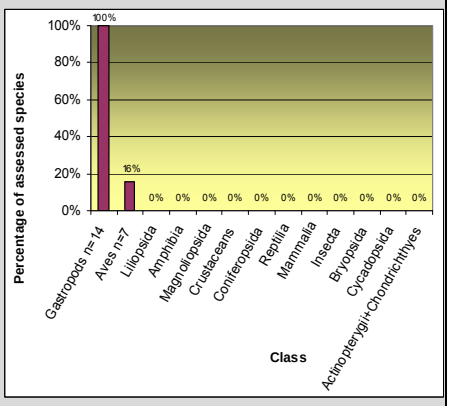
Taxonomic Group	Sub group	Estimated number of species described	Number of Species Assessed
Plants	Mosses	11	0
	Ferns	14	0
	Cycads	1	0
	Conifers	17	0
	Dicots	269	1
	Monocots	84	0
	Algae	21	0
	Fungi	250	0
Total Plants		**667**	**1**
Birds		**44**	**44**
Mammals		**24**	**24**
Reptiles		**8**	**1**
Amphibians		**0**	**0**
Fish	Marine Fish	563	46
	Fresh-water Fish	6	0
Total Fish		**569**	**46**
Invertebrates	Insecta	61	0
	Arachnids	0	0
	Hard Corals	178	178
	Molluscs (Bivalves and Gastropods)	70	16
	Crustaceans	Unknown	1
	Hydrozoa	Unknown	1
	Other invertebrates	Unknown	0
Total invertebrates		**309**	**196**
TOTAL		**1621**	**312**



The pie chart above shows the percentage of assessed species in each red list category*



The graph at the middle right shows the percentage of assessed species listed as threatened (CR, EN, VU categories)



The graph on the bottom right shows the percentage of the Cook Island's assessed species that are endemic, by class. (not including EX or EW). There are 21 endemic species listed for the Cook Islands, all of which are Gastropods or Birds.

*IUCN categories key: CR= critically endangered, EN= endangered, VU= vulnerable, NT= near threatened, LC= least concern, DD= data deficient, EW= extinct in the wild EX= Extinct

[i] (Pippard, 2009)

1.3. Protected Areas

The Program of Work for Protected Areas (PoWPA) falls under the Convention for Biological Diversity (CBD). All signatories including the Cook Islands agreed to effectively conserve 10% of terrestrial habitat by 2010 and marine by 2012. Protected Areas conservation may take on several meanings: from 'no take' areas to sustainably managed community resource areas.

In 2010 the Cook Islands had thirteen Protected Areas in the World Database on Protected Areas. This database contains a number of inaccuracies, omissions and repetitions in relation to the Cook Islands[i]. The Cook Islands NBSAP document records 22 known Protected Areas, which cover a total area of 17.5 square kilometres. Saul and Tiraa listed 36 Protected Areas while the CRISP Report lists a total of 39 marine Protected Areas alone, though a number of these were no longer functioning[ii]. Because no systematic data is available, there may also be other Protected Areas that exist in the country but remain unidentified.

Traditional leaders, Island Councils, landowners, communities and government have all played roles in establishing and managing protected areas in recent years. From a number of possible sorts of Protected Areas, in the Cook Islands at present there are six types: raui, private nature reserves, conservation areas, wildlife sanctuary, national park, and whale sanctuary. Except for raui, most types are represented by a single example.

The majority of protected areas in the Cook Islands consist largely of areas not covered by legislation, although there are several that are legislated for or some means of protection given, these include; Suwarrow National Park Declaration, Takutea Island Regulations, Takuvaine Water Catchment Regulations, National Whale Sanctuary Declaration, Rakahanga *rahui* by-laws and Pukapuka *rauwi* by-laws, Aitutaki Motu Kitiu and Ootu Marine Reserves.

While the traditional management methods used by the Cook Islands undoubtedly contribute to the attainment of international protected areas and conservation targets, their role in this regard is often not recognized. Protected Areas managed in the traditional way are generally not accounted for in international protected areas databases, and are not reported to international conventions as part of country national reporting processes. In fact, conclusive information about how many such areas exist is still lacking. Table 25 lists known Protected Areas in the Cook Islands.

Figure 12 Taro patches in the Takuvaine Water Catchment Area. SOURCE: J. Brider

[i] (E. Saul & Ana Tiraa, 2004)
[ii] (Govan et al., 2009)

Table 25 Currently recorded Cook Islands Protected Areas

Island	Type	Name of Area	Total Area	Comments
Cook Islands Water	Whale Sanctuary	Cook Islands EEZ	2 million km^2	Established in 2001 for the protection of whales
Takutea	Wildlife Sanctuary	Takutea Wildlife Sanctuary	120 ha	Established 1903, re-established in 1950 by Takutea Island Trust. Endorsed as a Community Conserved Area under the Atiu and Takutea Environment Regulation 2008. Inclusion of lagoon not determined
Suwarrow	National Park	Suwarrow National Park	160 ha	Established in 1978 under the Prime Minister's Office. Inclusion of the lagoon not determined
Rarotonga	Nature Conserved Area	Takitumu Conservation Area	155 ha	Established in 1996 under landowner committee to protect endangered native birds and their habitat
	Nature Reserve	Highland Paradise	32.5 ha	Family operated reserve containing natural features of cultural significance
	Marine Reserve	Aroa Raui	32.5 ha	Established in 2006 to allow the rejuvenation of natural resources
	Marine Reserve	Tokerau Raui	4 ha	Established in 2007 to allow the rejuvenation of natural resources
	National Park Reserve (Terrestrial)	Nikao Social Centre	?	Established in 2000 for Public Recreation
	Marine Reserve	Pouara Raui	5 ha	Established to allow the rejuvenation of natural resources
	Marine Reserve	Aroko Raui	71.1 ha	Established in 1998 to allow the rejuvenation of natural resources
	Marine Reserve	Titikaveka Raui	?	Established to allow the rejuvenation of natural resources
	Marine Conserved Reserve	Tikioki Raui	40	Permanent reserve area
	Community Managed Area	Takuvaine Water Catchment	229 ha	Established in 2006 under the Environment (Takuvaine Water Catchment) Regulations for species and habitat protection
Aitutaki	Marine Reserve	Ootu Raui	220 ha	Established in 2000 as a 140 ha reserve, additional 70 ha included

				as restricted entry zone
	Marine Reserve	Motu Kitiu Raui	407 ha	Established in 2000 as a 210 ha reserve, additional 197 ha included as restricted entry zone
	Marine Reserve	Maina Raui 1	128 ha	Established in 2000 as a No Entry reserve, predominantly reef flat
	Marine Reserve	Maina Raui 2	81 ha	Established in 2000 as a Restricted Entry reserve, 80ha is inclusive of lagoon
Pukapuka	Marine and Terrestrial Reserve	Motu Kotawa	90 ha	Reserved for Yato Village, inclusive of entire islet and surrounding lagoon
	Marine and Terrestrial Reserve	Motu Ko	300 ha	Reserved for Ngake Village, inclusive of entire islet and surrounding lagoon
	Marine and Terrestrial Reserve	Motu Uta	50 ha	Reserved for Loto Village, inclusive of 30% of the islet
	Marine and Terrestrial Reserve	Motu Niua	10 ha	Reserved for Yato Village
Mitiaro	Wetland	Te Roto Nui	?	Reserved for habitat protection and rejuvenation of freshwater eels (*Anguilla obscura*)
Rakahanga	Lagoon	Te Taha ki Raro,	?	
	Marine Reserve	Paerangi	?	
	Marine and Terrestrial Reserve	Te Kainga	?	
Manihiki	Salt-marsh lakes	Lake Porea and Tepuka Roto	?	Traditional breeding and raising ground for Milkfish (*Chanos chanos*) to supplement food supply during periods of rough seas

1.4 Threats Analysis

The threats analysis will highlight the significant pressures placed upon species and ecosystems mentioned in the previous sections. This section describes the identified threats present and attempt to provide key necessary changes required to address these threats. There are many gaps in information, and more work needs to be carried out to raise an awareness of the issues, and therefore help identify additional information on the current status of some species. Appendices 2-4 contain the tables from which sections 1.4.1 and 1.4.2 was based and expanded upon

1.4.1 Endangered Species

Plants

Invasive species are the biggest threats to the flora of Cook Islands, and will continue to be so as we develop our air and sea lanes between neighbouring nations such as Australia, Fiji, French Polynesia New Zealand and the United States of America. Biosecurity legislation was introduced in 2008 to replace an outdated suite of legislation dating back to 1973 which lacked deterring penalties and did not reflect current global best practices. This legislation supports a competent biosecurity workforce who has, to date, intercepted and eradicated Giant African Snail (*Achatina fulica*), Coconut Rhinoceros Beetle (*Oryctes rhinoceros*), Queensland Fruitfly (*Bactrocera tryoni*) and Cane Toad (*Bufo marinus*). The Government continues to monitor and manage invasive species including the Glassy-winged Sharpshooter (*Homalodisca coagulata*) and Cuban Laurel Thrip (*Gynaikothrips ficorum*). Although mechanisms are in place to address the threat of invasive species, on-going vigilance and up-skilling is required.

Social behavioural changes and preferences towards more "aesthetic" or "purpose-serving" fruit species have resulted in a reduction in the numbers of native tree species, particularly in residential areas. The spreading canopy growth form of many native trees, especially *Tamanu*, excludes it from being retained or planted in congested urban areas. A similar shift is occurring for *Nu* or Coconut Palm (*Cocos nucifera*) where dwarf varieties are planted in favour of taller varieties for safety reasons, e.g. falling nuts and toppled trees, as stipulated under the Cook Islands Building Code. Other shifts observed include a coconut-to-palm transition, with the Manila Palm (*Veitchia merrillii*) and Golden Cane Palm (*Dypsis lutescens*) being preferred favourites.

The traditional medicinal and cultural use of plants in the past ensured that many native species were retained and dispersed to new areas as the traditional knowledge was transferred to new areas or practitioners migrated from family lands. In this modern era and the availability of western medicines and resources has severely reduced the demand for traditional medicines and as a result, the preservation of medicinal plants has diminished. Further to this, traditional medicine practitioners are unable to pass on knowledge to younger generations who have aspirations of high-paying salary jobs and migrating abroad. This inability to transfer knowledge further reduces the awareness on the importance of these native species. Many of the medicinal species are small herbaceous plants and considered weedy. Herbicide use and lawn management has removed many populations and altered suitable habitats for these species. Introduced pests are a problem for some medicinal species such as the *Poroiti* (*Solanum anthropophagorum*) on Mangaia and Mitiaro which became infested with ladybirds (*Epilachna vigintioctopuncata*) after Eggplant and Chilli was

introduced to the islands[i]. The Ministry of Agriculture has assisted the community by providing seedlings of several medicinal and culturally important species however these initiatives are usually project-based, where once the project ceases, internal structures are not in place to ensure the sustainability of the initiatives are not supported through local budget appropriation. This is an on-going scenario whereby immediate concerns are identified and project funds are sought to address it, however in the long term, the Ministries budget appropriations are guided by their core functions, resulting in the lack of sustainability of initiatives.

Figure 13 Traditional medicine practice. SOURCE: NES

Habitat change, especially in coastal areas where beachfront is converted to Tourism Developments reduces available habitat for native species such as Beach Morning Glory or *Poue* (*Ipomoea pes-caprae*) and Portia Tree or *Miro* (*Thespesia populnea*). To further improve the value of beach front property, there have moves by property owners to remove coral heads from lagoon areas to provide "rock-free" swimming areas. The inland forests have not fared any better, as lands on the coast are slowly becoming occupied, there have been shifts for residential properties in the interior of the Rarotonga. As a result mountainsides have been carved up and native forests removed in the process.

The risk of fire is a pertinent concern, particularly on the Ngaputoru Group where the once endemic *Iniao* and native Pandanus and sandalwood or *Ai* (*Santalum insulare*) occurs. The *Iniao's* habitat is the makatea, leaf litter build up places the species at risk to fire. The occurrence of lightning strikes on these islands is small but man-made fires have, on occasion, escaped and burnt much of the islands vegetation. A risk specific to the *Iniao* is trunk vandalism where visitors to its habitat engrave names and dates on its smooth trunk. Having personnel on hand at the site has not proven successful as the habitat is isolated, exposed to the sun, wind, rain and regular access across the razor sharp makatea is discouraging. *Ai* could be at risk from government supported propagation projects for introduced Indian Sandalwood (*S. album*) and New Caledonian Sandalwood (*S. austro-caledonicum*). To mitigate against this government needs to take proactive action to ensure the expansion of introduced species does not come at the expense of native biodiversity. To achieve this government should review the Biosecurity Act 2008 and its decision-making mechanisms regarding the introduction of any species into the country and its risk or adverse impacts on native species. The government needs to finalise the draft Biodiversity Regulations established under the Environment Act 2003 to formalise the appointment of its Biodiversity Division and establish their functions and mandate.

[i] (Teariki Rongo & Julia Rongo, 2004)

Animals

Figure 14 Giant Clams in Aitutaki. SOURCE: MMR

Unlike plants, habitat destruction and over-harvesting play a greater role in species lost than invasive species, except when considering the bird group alone. The upward invasion of alien plant species continues to smother and kill the native forest canopy destroying habitat for native birds such at the *Kakerori*, the *Ioi* or Rarotongan Starling (*Aplonis cinerascens*), the *Kuramoo* and endemic landsnails. Development along coastal, sloping and wetland areas e.g. large hotels and expanding residential areas can potentially discourage marine turtle nesting sites and *Upaki* or Mud Crab (*Scylla serrata*) habitat and further displaces birds from native forests. Feral Pigs (*Sus* sp.) and Goats (*Capra hircus*) are a problem in the Ngaputoru Group where pig damage has been observed in family plantations and around turtle nesting areas. Pigs have also been observed eating *Kaveu*. Goats on Atiu have been blamed for the removal of most understorey vegetation in native forests and grass species diversity has been reduced to only a few low-growing, mat-form species[i]

Overharvesting of Parrotfish, *Paua* and *Kaveu* and the resulting impacts on food security has resulted in many communities instigating harvesting bans on these species. The majority of demand driving these harvests has primarily come from Rarotonga and Cook Islanders living abroad. The consumption of marine turtles is still largely practiced in the Outer Islands under the auspices of customary practice; however there are trends arising that suggest society may be moving away from consumption, in favour of tag and release programmes, as is the case in Aitutaki and Mauke. *Moa Kirikiri* continues to be at risk from hunting while improved access to the native forest exposes the species to increased hunting and human interactions.

To address these issues of habitat destruction and overharvesting Government is developing new legislation to manage development in vulnerable areas and prohibit and place restrictions on harvest size and quantities of threatened species. Island specific management plans have also been passed to manage Tuna fisheries, Black-lipped Pearl Oysters and the emerging Bonefish or *Kiokio* (*Albula glossodonta*) tourism industry.

Figure 15 Coconut Crab on Suwarrow. SOURCE NES

The impacts of rats on native species continue to threaten the birds and invertebrates of the Cook Islands. The Kakerori populations on Rarotonga

[i] (Sykes & Meyer, 2009)

may now be dependent on human-maintained rat poisoning efforts. Fortunately rats do not appear to be a problem for other bird however the impact of rats on invertebrate populations is largely unknown.

To conclude this section, Box 5 presents a case study on the reintroduction of the *Kura* to Atiu from Rimatara, French Polynesia. This project has generated significant international interest due to the species involved and the transboundary nature of the project. To date the project has been a great success both from a biological and collaborative perspective between communities, private sector, governments and international partners

Box 5. The Kura Reintroduction Project

The *Kura* or Kuhl's Lorikeet (*Vini kuhlii*) had a historical natural range that spanned from Rimatara in French Polynesia to the Southern Cook Islands, however since the 1800's the species was extirpated from the Cook Islands, possibly through overharvesting for its spectacular red feathers which were highly valued by early Polynesians[i]. Two centuries later, the populations on Rimatara have remained fairly stable at around 750-900 birds[ii]. A decision was made to establish an "insurance" population of *Kura* on another island within its natural range. To ensure that this new population survives, the new island had meet a certain criteria i.e. must be Ship Rat (*Rattus rattus*) free and should not have established populations of lorikeets, which could compete with the reintroduced birds[iii]. To the end, Atiu fit the bill, the only factor that may have an impact on the reintroduced birds is the abundance of Myna birds (*Acridotheres tristis*) on Atiu which were introduced to control Coconut Stick-insects (*Graeffea crouanii*). However it has been concluded that this was not a serious threat because the introduced Blue Lorikeet (*Vini peruviana*) thrives on Aitutaki in the presence of abundant mynas[iii].

The Kura is listed as 'endangered' on the IUCN red-list and is protected under CITES Appendix II, national legislation on Rimatara and by traditional *tapu* (taboo) on Atiu following the bird's reintroduction to the island[iv]. The transnational reintroduction required a wide range of approvals and support in French Polynesia, Cook Islands and France. It was implemented by the Cook Islands Natural Heritage Trust, Te Ipukarea Society, the Ornithological Society of French Polynesia and Zoological Society of San Diego[iii].

The collection of birds on Rimatara began in April 2007 after governmental, cultural and legal authorizations were in order. The island community authorized the collection of 27 birds which were collected by three "teams" of specialist biologists and conservationists from six different countries. After achieving the goal of 27 birds which quickly acclimatized to a captive diet, each bird was treated for ectoparasites and banded for identification. Six days after the last bird was captured, the 27 Kura, the field team and Rimatara community representatives were flown 400km away to the eagerly awaiting community of Atiu[iii].

On the 24th April 2007 twenty-seven *Kura* were reintroduced to Atiu and released at two separate locations. The Atiu dignitaries, officials and school children participated in the release of the Kura[iv]. The inclusion of Rimatara community representatives has cemented relationships between both island communities and reaffirmed efforts to ensure these birds survival[v]. Despite the community-to-community agreement that no bird would be transferred from Atiu to any other island or nation, within two months of the reintroduction four birds flew 50km to the neighbouring island of Mitiaro, and surveys one year later have reconfirmed there presence[iii].

[i] (Lieberman & McCormack, 2008; McCormack & Kunzle, 1994)
[ii] (Lieberman & McCormack, 2008)
[iii] (McCormack, 2008)
[iv] (Heptonstall, 2010; Lieberman & McCormack, 2008; McCormack, 2008)
[v] (Albar, Doukas, Chong, & Gouni, 2009)

The success of the project hinges on the islands maintaining their Ship Rat-free status to which the islands have committed themselves. Asides from this the project also highlights several successes, the capture, transport and release of the birds went ahead flawlessly. The island communities have been integral to the effort from its inception and endorsed the plan without reservation and are now fully engaged stakeholders in protecting the Kura as well as maintaining the dedicated goal the remain Ship Rat-free. The project has resulted in the recognition of the importance of protecting their islands from the threat of introduced species by the communities[iii]

Figure 16 Kura feeding on Banana flowers, (R) traditional Cook Island Head-dress with Kura feathers. SOURCE: McCormack, 2007

1.4.2 Threatened Ecosystems

Climate Change, Ecosystems and Biodiversity

Due to the global scope of this phenomenon it is felt that it warrants its own section. Climate change is expected to rapidly increase the frequency and intensity of many naturally occurring threats. In this section we highlight five key threats and how these threats impact on six core ecosystem and biodiversity themes. The interaction between threat and theme are summarised in Table 26.

Table 26 Summary table of the major threats expected from Climate Change events. SOURCE: Adapted from the draft Cook Islands Second National Communication to the UNFCCC

	Sea Surface Temperature Rise	Sea Level Rise	Extreme Weather Events	Rainfall Variation	Ocean Acidification
Coastal Zone & Coral Reefs	Coral bleaching, changes in distribution and migration, species displacement	Inundation, erosion and increased storm surge, habitat shifts	Habitat destruction, increased sedimentation	Increased freshwater water runoff, increases in salinity and sedimentation	Reduced calcification of corals
Marine Resources and Fisheries Ecosystems	Changes in migration and distribution patterns	Habitat shifts	Habitat destruction, increased sedimentation	Freshwater water runoff, salinity changes and sedimentation	Changes in migration and distribution patterns
Freshwater Ecosystems	Habitat shifts and destruction, increased CO_2	Salinity increases, habitat shifts and destruction	Saltwater intrusion	Altered water regimes	
Agriculture & Food Security Ecosystems	Changes in food seasonality, species displacement	Increased salinity of Taro wetlands	Habitat destruction, increase pressure on food resources	Variation in salinity, flooding and droughts	Reduced calcification of corals affects total food chain
Biodiversity and Ecosystems	Changes in migration and distribution patterns	Habitat shifts and destruction, species displacement	Habitat destruction, increase pressure on food resources	Changes in migration and distribution patterns	Reduced calcification of corals, decreased survivorship of many marine larval life forms

Coastal Zone and Coral Reefs

These ecosystems are vulnerable to all five identified threats, increases in sea surface temperature has been shown to cause coral bleaching as exemplified by the mass coral bleaching event across the Pacific in 1997-98[i], sea-level rise in conjunction with the increased potential for more extreme weather events has been shown to threaten coastal areas and species populations[ii]. The anthropogenic impacts on this ecosystem

[i] (Fitt, Brown, Warner, & Dunne, 2001; Goreau, McClanahan, Hayes, & Strong, 2000)
[ii] (Baker, Littnan, & Johnston, 2006; Dasgupta, Laplante, Meisner, Wheeler, & Yan, 2007; Galbraith et al., 2002; W. Mitchell, Chittleborough, Ronai, & Lennon, 2000)

can be highlighted by eutrophication events as a result of heavy nutrient loads entering lagoons from ineffective sewage waste treatment and agricultural activities. Tourism and residential developments are primarily located along the coast and this has resulted in most of the native coastal vegetation being replaced with ornamental shrubbery to allow for better aesthetics and ocean views. Coastal protection is a major concern for government and landowners, past responses were to build sea and rock walls which today have resulted in foreshore scouring and long shore drift. Although legislation exists to manage development in this ecosystem, the implementation and enforcement of the law has not been successfully carried out. The lack of island specific and coastal-type appropriate or cost-efficient technology added to this problem

Marine Resources and Fisheries Ecosystems

The Cook Islands depends heavily on marine resources and fisheries and any impacts the ecosystems of these resources will impact heavily on national development. Migratory Tuna fisheries (*Katsuwonus pelamis* and *Thunnus* spp.) contribute towards economic growth but with projected impacts on sea surface temperatures and ocean acidification there is potential for migration patterns to shift with migrating thermoclines[i] or oceanic dead-zones resulting from carbon dioxide acidification. Additionally habitat destruction through natural and anthropogenic sources is of concern. The Cook Islands has a large reserve of manganese nodules laying on the seafloor[ii] which government is investigating as a potential economic resource. Any activities associated with the prospecting, excavation, removal and processing of these nodules needs to be managed properly and in a sustainable manner. Illegal and unreported fisheries continues to be a concern for many Pacific Islands, the Cook Islands have a large exclusive economic zone (EEZ) but only one patrol boat which results in a large section of the EEZ going unpatrolled. Negotiations with the Samoan government have resulted in a joint patrol operation between the two nations but a much greater effort is needed to protect fishery stocks.

Figure 17 Freshly caught fish supports local diets. SOURCE: N. Hauser ©

[i] (Hunt, 2003; Robinson et al., 2005)
[ii] (Clark, Li, Icay, Morgan, & Igarashi, 1995; Nishimura, 1974; Pautot & Melguen, 1979; Usui, Nishimura, & Mita, 1993)

Freshwater Ecosystems

Figure 18 Papua Waterfall on Rarotonga. SOURCE: J. Brider

Saltwater intrusion and shifting rainfall patterns present a real threat to freshwater ecosystems. The Cook Islands has few standing-water lakes while most streams are ephemeral, relying on seasonal rains. Tying in climate change changing rainfall patterns and increased temperatures can places these ecosystems at greater risk of decline. These changes often result in increased algal growth which further impacts upon species within this ecosystem[i]. The Cook Islands have many wetlands, with terrestrial freshwater swamps and bogs forming the majority of wetlands. These are very important ecosystems for the various functions they provide in terms of pollution filtration and food resources. The main threats to freshwater ecosystems are centred on anthropogenic threats that relate to society's perceptions of "what the purposes of freshwater ecosystems are?" and societal changes from being an agricultural society to a consumer society. There is strong pressure from landowners to in-fill wetlands for residential and commercial purposes which results in greater personal income through rental fees. As income increases in society, people no longer use the wetlands for agricultural purposes, instead opting for consumer lifestyles. This shift has resulted in wetlands being abandoned and native and useful species being displaced by highly invasive alien species. The construction of freshwater intakes for human consumption has altered water flow resulting in streams that no longer flow to sea. The use of streams for piggery tethers and general waste disposal is a practice that has only recently been addressed by government, in addition to this stream diversions had been poorly developed, oftentimes resulting in further degradation to surrounding areas. From a more natural source of disturbance, flooding in wetlands is perceived as a nuisance rather than a natural function so as a result there are pressures to improve drainage out of wetlands.

Figure 19 Locally produced fruit at the Punanga Nui, Rarotonga. SOURCE: J. Brider

Agriculture and Food Security Ecosystems

Cook Islanders rely on all ecosystems for agricultural and food security purposes. Fish are caught off-shore, shellfish are gleaned from reefs and lagoon flats, taro is cultivated in wetlands and *Nu* and *Kuru* or breadfruit (*Artocarpus altilis*) are gathered from agricultural floodplains and flatlands while the fruit are harvested from mountain slopes. In addition to human needs, these ecosystems provide for an assortment of plants and animals. All ecosystems provide some food resource to some, if not all, species therefore the protection of ecosystems for food security needs to be a priority concern. Food resources are

[i] (Rutherford, Scarsbrook, & Broekhuizen, 2000; Sponseller, Benfield, & Valett, 2008)

predominantly seasonal and therefore anything that affects temperature and rainfall will ultimately impact on food security. Saltwater intrusion into wetlands will destroy taro crops as well as species that keep taro free from pests. Increasing ambient temperatures will force ocean thermoclines to migrate; it can also push terrestrial stratification layers upwards allowing new species to colonise higher into the mountains. Impacts in coastal areas are reducing the availability of food sources from this ecosystem as pristine or sustainable coral reefs continue to decline. Economic drivers forcing the agriculture industry to maximise outputs has resulted in fast growing, high yield, high income crops replacing native varieties in the fields and plantations. Traditional famine crops are becoming a rarity in home gardens, and knowledge pertaining to traditional methods of preserving foods is slowly being lost. In addition to the shift from a subsistence based society to an economic driven society other values of the agriculture and food security ecosystems are slowly eroded, if not faster on the main island Rarotonga. Along with this is the erosion of traditional knowledge and practises on land tilling, identification of famine crops and food preservation methods.

Native Terrestrial Ecosystems

Tropical cyclones are a regular natural occurrence in the Cook Islands which results in the destruction of many species. As a result of the destruction, native habitats are opened up and invasive alien species quickly move in and establish. This has been the main explanation for how species such as Balloon Vine (*Cardiospermum grandis*) and Mile-a-minute (*Mikania micrantha*) have rapidly dispersed and established themselves. The Balloon Vine was first recorded in Avarua, Rarotonga in the 1930's, today the species is present in all habitats from the coast to the peaks of several mountains. Although the endemic *Mato* (*Homalium acuminatum*) has evolved to cope and take advantage of disturbances resulting from cyclones but with the introduction of these vine species, the opportunities for *Mato* expansion have reduced. With the addition of Climate Change induced factors we can expect greater frequencies and intensities of tropical cyclones with the additional impacts of coastal inundation and higher than expected King Tides, these additions can exacerbate the current problems faced by all ecosystems.

Figure 20 Native forest surrounding iconic Te Rua Manga on Rarotonga. SOURCE: J. Brider

Like coastal and wetland areas, the lowlands, foothills and mountainous areas are threatened by expanding residential areas. The urban sprawl into the interior is opening up native forest to the threats of invasion. The excavation of mountains slopes for

building platforms and the development of access roads to these sites has created the necessary disturbance to allow invasive species to enter and in some cases, the machinery carrying out this work has provided the transport vector which brings these invasive species.

Feral goats and pigs are of particular concern in Mangaia and the Ngaputoru Group which feed in the makatea forests. There has been a noticeable decline in medicinal herb species from this ecosystem which further diminishes the ability to practice and pass on this traditional knowledge, in addition to medicinal species, economic plants such as the *maire* are also in decline due to the threat from feral pigs and goats.

1.4.3 Biodiversity Capacity Gaps

The shift in Government focus over the last 10 years from conservation to management of development has left a gaping hole in environment programmes. Biodiversity species management, monitoring, and recovery programmes, particularly for endangered, threatened or endemic species in the Cook Islands, is lacking and any activities concerning biodiversity management, conservation and protection are reactive and ad-hoc. The following section[i] will highlight the capacity gaps in six key biodiversity thematic areas.

The key biodiversity thematic areas identified are:

1. Biodiversity Conservation
    a. Species Management
    b. Invasive Species
    c. Ecosystems Management
    d. *Ex-situ* conservation
2. Biosafety and Biosecurity
3. Equitable Sharing of Benefits and Access to Biodiversity
4. Mainstreaming Biodiversity
5. Management of Knowledge related to Biodiversity
6. Education Awareness and Training

A full assessment of capacity gaps is included in Appendix 6

Biodiversity Conservation

Species Management

A comprehensive assessment of the status of wildlife in the Cook Islands, including an inventory of threatened, vulnerable or endangered species is generally not available. The cessation of many monitoring and data collection programmes for species of significance, both terrestrial and marine, has meant that there is limited knowledge of biodiversity, habitats and ecosystems available. Much of the up-to-date collection of scientific data, data which could give early indications of species decline and potential loss of biodiversity, is limited to those species that are considered of 'economic value'. The Cook Islands Biodiversity database under the Natural Heritage Trust is the only comprehensive biodiversity database however it is limited in scope to an inventory of species present in the Cook Islands and a bibliography of biodiversity literature.

Cook Islands capacity to develop and implement biodiversity conservation strategies

[i] (Upoko, 2005)

and plans is limited by data, insufficient human resources and the lack of high level support programmes. There is limited expertise and availability of expertise to develop and implement programmes related to threatened and endangered species including promoting protection and recovery of these species.

Invasive Species Management

A key component to managing biodiversity is to manage the threats to that biodiversity, such as invasive species. Invasives have the potential to impact many sectors of society including agriculture, marine and human health, and as custodians of our endemic and native biological resources it is of utmost importance that we take action now to reduce the threats imposed by invasive species.

While border control procedures to minimise the introduction of new invasive species are in place, the necessary resources and personnel to be fully effective at the international and national levels are lacking. Border control covers the movement of passengers and cargo via air and sea transports and in addition to this they must manage wastes and ballasts from these transports. Several initiatives have been implemented to educate and make the public aware of the risks involved in smuggling in plants from overseas undeclared however the problem continues highlighting the need to expand or alter the current education and awareness program.

The sphere of invasive species management is vast and severely under resourced (especially human and financial) and as a result some invasive species populations have grown to levels where eradication or even management is either impossible or well beyond our means therefore a concentrated effort will be needed at the national, regional and international arenas to manage where we can.

Ecosystems Management

Human activities are having a major impact on ecosystems in the Cook Islands including changes in ecosystem structures and increasing degradation of resources. Encroachment and habitat loss is occurring on a regular and progressive basis in identified sensitive areas and highlights the insufficient measures in place to protect important terrestrial, reef and lagoon ecosystems.

Past approaches to the development and management of ecosystems or protected areas have been fragmented and reactive. Mechanisms such as Ra'ui of lagoon or inshore resources have been applied to a few areas however management, monitoring and enforcement of these areas have been weak. Questions have also been raised as to the effectiveness of such mechanisms given the limited overall goals of these protected areas.

Although the establishment of a national system of protected areas has previously been recommended for consideration, a major gap continues to be that important or threatened ecosystems, sensitive areas, and biodiversity resources have not been clearly identified for conservation and that resources and technical capacity for ecosystems management are limited. The absence of legislation to support and govern the management of ecosystems, protected areas and biodiversity resources is a concern. Regulations under the Environment Act 2003 for Suwarrow National Park and Biodiversity Conservation are in the draft stage however more comprehensive legislation may be required.

Ex situ Conservation

Ex-situ activities for conservation of important crop species is well developed under the Ministry of Agriculture utilising regional facilities and expertise, however it is the *ex-situ* conservation of other native, endemic and medicinal species that is lacking. Policies and management plans to conserve these species *ex-situ* are lacking and there is limited knowledge and understanding of the importance of, and potential for *ex-situ* conservation. In–country ex-situ conservation is currently not feasible, given the lack of appropriate facilities and scientific capacity to establish, protect and maintain gene banks/genetic resources centres and the costs associated with set up and operation. Aquaculture facilities have recently been established as a pilot project on Rarotonga for some fish species however the long term outcomes of this project will need to be monitored for the success of such operations in the Cook Islands.

Biosafety and Biosecurity

Biosafety and biosecurity in the Cook Islands is limited by resources, technical capacity and inadequate monitoring and enforcement measures. An enabling environment for effective biosafety and biosecurity is lacking. There are no specific policies, procedures or legislation in place to accommodate biosafety, including the trans-movement and safe handling of LMO's and GMO's. Such organisms are not currently covered under the Cook Islands Biosecurity Act however this can be addressed under Regulations. A Biosafety Policy Framework has been drafted but needs further development before it can be finalised. The Biosecurity Act was passed in 2008, and Regulations are currently being drafted, however further capacity development will be necessary to ensure effective implementation of both. Basic monitoring procedures are in place for biosafety at Customs and Quarantine but enforcement procedures are relaxed and require review. The capacity for the safe management of LMO's and GMO's is very limited. Current facilities for the storage of hazardous goods are inadequate, posing both a security and human health risk. A more coordinated approach is required to ensure that Ministries and Agencies have access to information and resources that will allow them to develop their own biosafety and biosecurity procedures as required.

Equitable Sharing of Benefits and Access to Biodiversity

The concept of Access and Benefit Sharing (ABS) is relatively new to the Cook Islands however it is an issue of some importance given the close and traditional dependence of our people on local biological resources. Also, past research activities that accessed biological resources were approved with little consideration given to ensuring the benefits arising out of that access were shared equitably.

A major capacity gap is the lack of understanding and awareness of decision makers, such as the National Research Committee, of Access and Benefit Sharing (ABS) issues and why it is important for the Cook Islands to establish an effective enabling environment to manage ABS activities. Currently, there are no suitable arrangements for the effective management of ABS in the Cook Islands including lack of legislation, policies, institutional structures and management systems such as a system of prior informed consent. Little is known about research activities that access biological resources after they have received their research approval and there is limited capacity to monitor these activities in country. There is no means of enforcement of the requirements of the approval permit, especially once the researchers have left the country. Overall there is a general lack of capacity for the implementation of Access and Benefit Sharing in the Cook Islands.

Mainstreaming of Biodiversity

At the national level, policy frameworks to support implementation of biodiversity activities, including the National Biodiversity Strategy and Action Plan (NBSAP), are weak. To date, local implementation of the NBSAP has been slow and mainly been limited to externally funded enabling activities under the Convention on Biological Diversity (CBD). Biodiversity issues are not treated as priority for government and are easily subjugated by other environmental management interests such as waste and pollution.

The lack of integration of biodiversity priorities into national economic and development planning and budgetary processes means that there is a constant struggle for recognition and support, and limited consideration of biodiversity issues in national decision-making. In particular, the lack of a National Biodiversity Programme for coordinated implementation of the NBSAP and other biodiversity initiatives is a significant gap and means that current activities are prepared on an ad-hoc basis and dependant on annual budgetary support, external funding or individual scientific interests. Institutional structures, facilities and local technical capacity to undertake biodiversity activities are also inadequately developed. Systematic communication amongst key stakeholders in some sectors for cooperation and coordination between agencies and to minimize overlap of responsibilities remains poor.

Management of Knowledge Related to Biodiversity

Deficiencies in biodiversity related information management, including documentation of traditional knowledge and practises related to customary use of biological resources, are a concern as biodiversity information and data is necessary to aid informed decision making. In general, scientific knowledge and information for biodiversity is scattered and poorly managed within different agencies and organisations. Currently, the Cook Islands Biodiversity database under the Natural Heritage Trust is the only comprehensive biodiversity database however it is limited in scope to an inventory of species present in the Cook Islands and a bibliography of biodiversity literature. Local capacity for scientific collection of biodiversity data, including for research, is limited as well as capacity for data analysis.

Poor management of traditional knowledge and practises (TKP) related to customary use of biological resources in the Cook Islands is a major gap. Understanding of TKP in the Cook Islands is usually limited to local practitioners such as ta'unga (traditional healers), many of whom are reluctant to share their knowledge of biodiversity species used in traditional medicine due to fear of misuse and abuse by others, including foreigners. Oral history and records have been traditionally relied on to preserve knowledge however this can lead to loss of valuable information if this knowledge is not passed on. Programmes or attempts to record traditional knowledge have been inconsistent and ad hoc. Limited attempts have been made to capture traditional knowledge and practises from outer islands – each island can have different and locally specific traditional knowledge and practises based on the biological resources of that island. The Cook Islands also has poor policies and legislative frameworks in place to protect traditional knowledge and practises and the rights of the holders of such knowledge, as well as to prevent bio-piracy.

Chapter 2: Status of Implementation of NBSAP

Chapter 2: Status of Implementation of NBSAP

The Cook Islands ratified the Convention on Biological Diversity (CBD) in 1993. This has obligated the Cook Islands to:

1. Conserve its endangered species;
2. Develop a system of protected areas;
3. Reduce the harmful effects of invasive species and prevent further invasion;
4. Use biodiversity in a sustainable manner;
5. Preserve knowledge related to biodiversity; and
6. Ensure an equitable sharing of the benefits of biodiversity

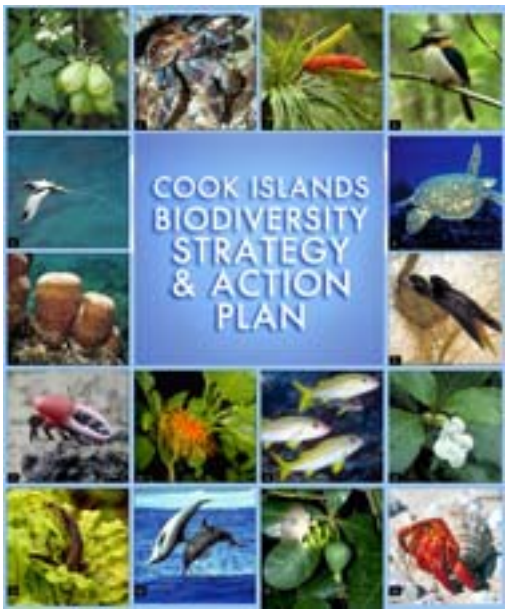


Figure 21 Cook Islands NBSAP. SOURCE: NES

In order to implement the CBD, the Convention states in Article 6 that the Parties shall "…. develop their own national strategies, plans or programmes for the conservation and sustainable use of biological diversity…" In order to achieve this, the Cook Islands government began a process in 1996 to develop a National Biodiversity Strategy and Action Plan (NBSAP).

The Cook Islands received assistance to prepare its NBSAP through the UNDP/GEF Enabling Activity for Biodiversity (EA) Project[i]. This process started in 1996, though progress was extremely slow in those initial years, and the final project document was not signed until June, 2000[i]. The subsequent preparation of the NBSAP also took longer than originally anticipated, for a number of reasons. Among the more significant of these were apparent differences in opinion on the preferred content of the Project Document between the Cook Islands, UNDP head office in New York and the UNDP multi-country office based in Samoa[i]. Unfortunately, subsequent opportunities to revise the project document to more closely suit the Cook Islands priorities, such as through an inception report, were not utilised[i].

The development of the NBSAP document itself was carried out over a two-year period. A Chief Technical Advisor and a Chief Consultative and Administrative Consultant were appointed to guide and lead the process, and a project steering committee was established in 1999. This however was not fully functional until 2000 due to changes in government[ii]. The NBSAP steering committee consisted mainly of various government officials, and representatives from the northern and southern Cook Islands. In order to ensure the wide stakeholder input into the NBSAP development, two representatives from the traditional leaders' bodies and several outer islands representatives were also included.

A series of workshops were held with members of the community, both on Rarotonga,

[i] (Butler, 2003)
[ii] (McCormack, 2002)

and throughout the Southern Group. Unfortunately, due to transportation logistics to the Northern Group, workshops were only held in Penrhyn in the north. These workshops provided the basis for the preparation of the NBSAP document, which was endorsed by the Cabinet of the Cook Islands in April 2002.

The NBSAP identified eight themes with corresponding goals and actions, and was published both in Cook Islands Maori and English. Also incorporated into the NBSAP publication was a section on Cook Islands biodiversity sourced from the Cook Islands Biodiversity Database. This database was developed under the Cook Islands Natural Heritage Trust, established by Government in 1999 to collect, record and maintain a database of information on Cook Islands biodiversity.

Another section of the NBSAP publication provides additional biodiversity information identified at the national workshop. This includes community identified endangered species, invasive species, and suggestions for areas that could be considered in a national system of protected areas.

A case study on the implementation of the Cook Islands NBSAP was included in a publication by SPREP, Celebrating Pacific Island Biodiversity: case studies of island life. This is reproduced in Box 6.

One of the deficiencies of the NBSAP was that it lacked clear measurable targets, timelines, and indicators, making it difficult to measure progress. In a UNDP review of the NBSAP in the Cook Islands[i], it was determined that overall progress on NBSAP implementation was limited, and further work was recommended in translating the NBSAP strategies into detailed implementation plan and actual activities. Some of these were achieved under the NBSAP add-on project, discussed below.

Box 6. Implementing the CBD—a community perspective from the Cook Islands[ii]

Perhaps I should start by saying that the title of this note should be "implementation of the Convention on Biological Diversity (CBD) in the Cook Islands from a Cook islander's perspective". What gives me the authority to present my thoughts on this topic? Though I have over 15 years of conservation experience, ranging from biodiversity field research to advising on policy, this does not qualify me as an expert on the CBD. However, based on this experience, I can share with you my observations and thoughts on biodiversity conservation in relation to the CBD.

The Cook Islands was one of the first countries to commit to the CBD by signing it at the Earth Summit in 1992. The early years of the CBD had very little obvious impact on Cook Islanders, even for those directly involved. As the years went by, the convention became gradually more familiar to local environmentalists, but the knowledge of details contained in it remained sketchy. Those outside the environmental field remain totally oblivious to the Convention. However, the general public need not really be aware of it, so long as they support the principles behind it

The Cook Islands National Environment Service has largely dealt with the CBD in the past, with those outside government only recently becoming involved. This was a result of global recognition that non-government organizations and communities play a vital role in biodiversity conservation. This recognition is also further supported by the increase in

[i] (Butler, 2003)
[ii] (A. Tiraa, 2006)

funding opportunities available for civil society to accomplish conservation initiatives related to the CBD.

The Cook Islands undertook biodiversity conservation before the CBD came into being. Some of these activities were with donor assistance and others without. One example has been the highly successful Kakerori Recovery Programme (see Box 3). The programme commenced intensively in 1989 when the critically endangered land bird numbered 29 individuals. Today their numbers have grown to more than 250.

Conservation activities without donor assistance usually occur on islands where there are few or no people living, or on islands where conservation of resources is integrated into daily life as a matter of survival. In the absence of funding, these deeds go largely unrecognized. Donor-supported activities are promoted and reported upon regularly, hence they are acknowledged more often.

The Cook Islands has met some of its obligations under the CBD, including developing policies and national plans for the conservation and sustainable use of plants and animals. The Environment Act 2003, NBSAP and National Environment Strategy Action Framework (NESAF) are recent examples. Nevertheless, their implementation, as well as monitoring of policies and plans, has been relatively poor. A lack of resources, coupled with the absence of a focused biodiversity division (in 2006) are key reasons for this.

The Cook Islands Biodiversity Database partially fulfils obligations to the CBD by listing species for conservation. This information gathering commenced before the CBD existed and continues to expand (see Box 2).

Responsibility for managing the environment in the Cook Islands, including biodiversity, is divided among several government ministries, agencies and councils. Non-government organizations also assist in addressing biodiversity concerns. There is no aggregation of information generated by the different organizations dealing with biodiversity issues. As a result, exposure of biodiversity activities in global reports tends to be inclined towards the group who is reporting. Furthermore, lack of coordinated information exchange between groups results in ignorance of what others are doing.

The Cook Islands has yet to produce a report to the CBD. The cumbersome reporting procedures have made it difficult to fulfil this requirement[i]. The recent accessibility of funds for developing countries to assist with reporting requirements is a step in the right direction. It is early days yet, but we hope that the Cook Islands National Capacity
Self Assessment (NCSA) programme will help strengthen biodiversity conservation efforts in all areas.

When it comes to negotiation and advocacy processes in relation to the CBD, we are small in size and have limited negotiation capacity. Therefore we can do better by working with our Pacific neighbours in bringing issues to the fore. This way a wider extent of issues is covered. The Programme of Work on Island Biodiversity is one of the most important initiatives for the Cook Islands in this area. It will ensure dedicated attention is given to island biodiversity. I am extremely excited about this initiative. Its adoption at the Conference of Parties, and allocation of the right amount of resources will mean the policies and plans that we have set may even be implemented.

[i] (Tangianau, 2004)

2.2 Other NBSAP activities.

Apart from the funding support to the actual process of developing the NBSAP, as described above, a number of specific biodiversity related activities were undertaken with some assistance from the original project funding. These included:

1. Fieldwork and organisation of many of the corals on the Cook Islands Biodiversity Database;
2. A survey which identified 13 species of earth worms;
3. Organisation of marine fish data on the CI Biodiversity Database;
4. Arachnid survey of the Southern Group, which increased number of recorded spiders to 75; and
5. Biodiversity bibliography

2.2.1 NBSAP Add-On Project

The NBSAP add-on project was initiated to assess the capacity building needs of the Cook Islands, in three priority components of the convention. These were;

1. General measures for in-situ and ex-situ conservation;
2. Methods for evaluating or assessing threats to biodiversity; and
3. Preservation of traditional knowledge, practices and innovation.

The project also aimed to create ways of sharing biodiversity information through the development of a website to share the Cook Islands biodiversity information. The document was signed in 2002, though funds for the implementation of the project were not received until 2003. In that year a steering Committee for this project was formed. Its role was to guide and provide support to the implementation of the project and to ensure that the project activities in the project document were achieved. The committee consisted of government departments, traditional leader bodies and NGOs.

A number of NBSAP-Add on projects were identified, and locally based consultants were recruited to carry these out in 2004 and 2005. They included studies on:

1. A proposed national system of protected areas;
2. The impact of invasive alien Species on Rarotonga, Aitutaki, Mauke, Atiu and Mitiaro;
3. Surveying and Conserving Rare Traditional Medical Plants;
4. A Manuae Resource Management plan;
5. A Manuae Reef Baseline Survey; and
6. Draft regulations for Suwarrow National Park
7. A book on the traditional Atiuan knowledge of the phases of the moon
8. Several reports on status of native species (See Appendix 5)

Most NBSAP Add-On project reports recommended the strengthening of policies, guidelines and regulations in the sub-sectors of biodiversity studied.

2.3. Progress

The tables (Tables 27-35) below provide an indication of the progress on implementation for each of the themes and goals of the NBSAP, up until 2010. As there was a lack of indicators specified in the NBSAP, a column has been added that records survey reports etc. that can serve as indicators. Where there are none, some suggestions of appropriate indicators that could be used to measure future progress are made. The table has been colour coded to provide at a glance an indication of the progress on each of the identified activities. Green indicates relatively good progress, with some major accomplishments, orange refers to activities with limited progress, and blue indicates very little or no progress.

Table 27 Review of progress towards Goal A1 of the Endangered Species Management theme of the Cook Islands NBSAP

Theme A Endangered Species Management			
Goal A 1. Conserve Cook Islands native and important naturalised plants and animals, and provide for their sustainable use			
Actions	Outcomes	Indicators	Comments
a) Develop a programme to survey and conserve all endemic flowering plants and other endangered native flowering plants	CINHP	Cook Islands Biodiversity database, field survey reports (where they exist). Some have been deposited with the Office of the Prime Minister, and the National Library. A new endemic species of flowering plant described for Mitiaro[i].	• While a number of ad hoc surveys have taken place over the years, these do not appear to have been part of a systematic programme, nor has such a programme been developed. Surveys conducted but no conservation programme established. CINHP continues to operate, and the database is being revised (see Box 2, Chapter 1).
b) Extend the flowering plant programme (above) to include other types of plants that are endemic or native and endangered.	CINHP	Cook Islands Biodiversity database. Paper published on the dispersal of Fig seeds in the Cook Islands highlighting the need to conserve native dispersal agents over introduced dispersers[ii].	• As above.

[i] (Lowrey, Whitkus, & Sykes, 2005)
[ii] (Staddon, Compton, & Portch, 2010)

Theme A Endangered Species Management			
Goal A 1. Conserve Cook Islands native and important naturalised plants and animals, and provide for their sustainable use			
Actions	Outcomes	Indicators	Comments
c) Develop a programme to survey and conserve the rarer plants used in herbal medicine (*Vairākau Maori*).	Capacity and needs assessment completed for Mangaia and Mitiaro on the status of rare plants used in *Vairakau Maori*. Two Organizations were formed; one each on Mitiaro and Mangaia.	NBSAP add-on report. Two newsletter reports were produced for public information on the status of the rarer *vairakau* plants.	• Te Vaka Taunga – Te Rito O te Vairakau Maori (Registered NGO) were revitalized in 2005 and have taken on the role of coordinating and implementing the work identified under the project • NGO have now 87 members on four islands • Islands where the Organization has members are Rarotonga, Mangaia, Mitiaro, Mauke, Atiu, Pukapuka and Rakahanga.

Theme A Endangered Species Management			
Goal A 1. Conserve Cook Islands native and important naturalised plants and animals, and provide for their sustainable use			
Actions	Outcomes	Indicators	Comments
d) Develop a programme to survey and conserve endemic animals and rare native animals, covering mammals, birds, and other animals.	*Kakerori* recovery programme ongoing. *Kakerori* translocated to Atiu. *Kura* reintroduced to Atiu. *Tangaeo* fieldwork surveys completed, report pending. Terrestrial land snail surveys ongoing, 14 new species recorded to date[i]. Rarotongan starling (*I'oi*) survey[ii] Freshwater survey completed for Rarotonga 2010, recorded 18 fish species and 10 crustaceans[iii].	TCA reports to donors, annual population count. Project started with local and international NGOs to identify and document important bird areas and key biodiversity areas in the Cook Islands.	• This is one of the areas where real progress has been made with bird species. The relocation to Atiu is an activity that supports Article 9 of the CBD related to ex situ conservation. • Mitiaro and Atiu Regulations in force for protection of species of local concern.

[i] (Brook, 2010; Brook, Walter, & Graig, 2010)
[ii] (Ana Tiraa, 2010)
[iii] (Keith, Marquet, & Gerbeaux, 2010)

Theme A Endangered Species Management			
Goal A 1. Conserve Cook Islands native and important naturalised plants and animals, and provide for their sustainable use			
Actions	Outcomes	Indicators	Comments
Develop a programme to survey and conserve marine animals harvested for food or financial gain	No systematic programme has been developed, however: • MMR have conducted surveys with SPC on 4 islands; • MMR have undertaken a number of marine raui surveys, though much data remains to be written up in to reports. • WWF Eastern Polynesian Ecoregion project[i]. • Manuae island resource survey[ii]. • Coral reef Survey for Aitutaki, 2008. • Rarotonga Coral reef monitoring report[iii] • Rarotonga Fore Reef Community Survey for 2009[iv]	Various survey reports completed and referenced in the outcomes column.	• The Procfish report[v] updated the 1995 Preston et al report for Palmerston, and noted that some parrotfish species show signs of heavy levels of exploitation. • Two rare endemic species deepwater aquarium fish species exist.

[i] (Passfield, 2008)
[ii] (Teariki Rongo, 2006)
[iii] (Teina Rongo, Holbrook, & T. C. Rongo, 2006)
[iv] (Teina Rongo, T. C. Rongo, & Jackalyn Rongo, 2009)
[v] (Pinca et al., 2009)

Theme A Endangered Species Management			
Goal A 1. Conserve Cook Islands native and important naturalised plants and animals, and provide for their sustainable use			
Actions	Outcomes	Indicators	Comments
Note that marine plants were not specifically included in the original NBSAP.	However, surveys to date have listed 209 species of marine algae[i].	Preliminary illustrated field guide to common marine algae completed for Rarotonga and Aitutaki[i]	• Marine algae are now one of the better recorded marine species groups for the Cook Islands • One rare new species of red alga, also found in Tuamotu, French Polynesia. Many habitats to explore, especially deepwater, which may hold endemics

[i] (N'Yeurt, 2000)

Table 28 Review of progress towards Goal A2 of the Endangered Species Management theme of the Cook Islands NBSAP

Theme A Endangered Species Management			
Goal A2. Conserve important agricultural and non-naturalised species and provide for their sustainable use (Agro-Biodiversity)			
Actions	Outcomes	Indicators	Comments
a) Develop a programme to survey and conserve the rarer varieties of Wetland Taro (*Taro*), Coconut Palm (*Nu*), and other traditional agro-varieties and agro-species.	Progress limited to taro and coconut. Prior to 1999 and 2002 the Ministry of Agriculture collected data and conducted research on taro in association with SPC in Fij and Alafua School of Agriculture USP in Samoa. This work continued until 2007[i]. Prior to 1999 and 2002 the Ministry of Agriculture collected data and conducted research on how to improve the quality of coconut on islands that lack certain minerals in their soil, e.g. iron. This work has continued as above[i].	1986, research report on the Pesium rot on the local varieties of taro i.e. *tata kerekere* and *niue*. 1996 MoA worked with SPC and USP to address the taro blight affecting Samoa. 1992, soil research on Mitiaro, improving soil quality by adding iron to Mitiaro's coralline soils	• It is important to note, even though this work was carried out prior to the NBSAP project, MoA. Officers continue this work through their own plantations, and those who are still in the Ministry maintains contact with the agencies involved to keep themselves updated; • Pukapuka Women's Group in February received funding from the Green Earth to put together a proposal for further funding to have some of their species of taro in storage at SPC Fiji to be returned to the island. Process in progress.
b) Develop a programme to survey and conserve the rarer animals of agriculture and home.	Nothing developed	No progress	

[i] Tiera Mataora, pers comm., 2010

Table 29 Review of progress towards Goals B1 and B2 of the Invasive Species Management theme of the Cook Islands NBSAP

Theme B. Invasive species management			
Goal B1: Reduce the adverse impacts of invasive species on indigenous species and ecosystems, and prevent new invasions.			
Goal B2: Reduce the adverse impacts of invasive species on agricultural species and ecosystems, and prevent new invasions			
Actions	Outcomes	Indicators	Comments
a) Develop a programme involving all islands to survey invasive species in natural ecosystems and in the agro-ecosystem.	Survey and Assessment of invasive plants completed[i] MoA has a Research Division which maintains a database of agricultural pests, primarily insects, including invasive species Nothing initiated for marine invasives. A report completed by Anau Manarangi under the NBSAP add-on[ii].	Distribution and abundance survey of the common myna bird on Rarotonga[iii]. A survey and reducing the impact of invasive alien species on Rarotonga, Aitutaki, Mauke, Atiu, and Mitiaro[iv].	• This survey report covers the southern group only, and lists 18 terrestrial species, mainly plants. Marine invasives are not included. • It is expected that the data MoA pest database will be included in the Cook Islands Biodiversity database once the revisions to this have been completed, and it is open again for data input.

[i] (Space & Flynn, 2002)
[ii] (Manarangi, 2004)
[iii] (J. Mitchell, 2009)
[iv] (Manarangi, 2004; Manarangi & Wigmore, 2002)

Theme B. Invasive species management			
Goal B1: Reduce the adverse impacts of invasive species on indigenous species and ecosystems, and prevent new invasions.			
Goal B2: Reduce the adverse impacts of invasive species on agricultural species and ecosystems, and prevent new invasions			
Actions	Outcomes	Indicators	Comments
b) Develop a community-based programme to eradicate those invasive weeds and animal pests that are not yet widespread on particular islands.	Started.	Progress reports	• Some work undertaken on invasive weeds on Mangaia, Mauke and Mitiaro, but lack of follow up and monitoring means current status unknown. • Myna bird reduction programme for Atiu.
c) Develop national programmes to assist with the control of the more serious invasive weeds and animal pests in both natural and man-modified ecosystems.	Biosecurity Act 2008.	19 staff employed by MoA on biosecurity related issues	• Biosecurity is regulated through the biosecurity act, and administered through the biosecurity service of the Ministry of Agriculture. Though there are some regulations related to marine biosecurity, these are much more difficult to enforce, e.g. discharge of ballast water potentially containing invasive species.

Theme B. Invasive species management			
Goal B1: Reduce the adverse impacts of invasive species on indigenous species and ecosystems, and prevent new invasions.			
Goal B2: Reduce the adverse impacts of invasive species on agricultural species and ecosystems, and prevent new invasions			
Actions	Outcomes	Indicators	Comments
d) Undertake a multisectoral review of the control of transboundary and inter-island movement of terrestrial and marine plants and animals, and of LMOs/GMOs (Living Modified Organisms / Genetically Modified Organisms), with a view to establishing an independent Biosecurity Agency.	Biosafety in regard to GMOs and LMOs receives very little attention in the Act. There was a huge contention with the regional support received by the Cook Islands in addressing GMOs or LMOs at the national level. Cook Islands were concerned with the lack of capacity to implement various instruments and suggested the incorporation of LMOs into the Biosecurity regime, and to adapt the processes of the Cartagena Protocol to Biosecurity. The recommended 'model' legislation for biosecurity was unable to accommodate this request. However the definition for 'organisms' in the biosecurity act is an attempt to widen its scope to include LMOs, but processes for Risk Assessment Management, Prior Informed consent and Precautionary principle, to name a few are limited.	A report of a Survey of Baseline Information for Assessing the Capacity Building Needs of the Cook Islands for the Safe Management of GMO's has been completed[i] A legislative review for a National Framework on Biosafety completed[ii]	• Further progress not achieved

[i] (Turia, 2004)
[ii] (Teariki Rongo & Julia Rongo, 2004)

Table 30 Review of progress towards Goal C of the Ecosystems Management theme of the Cook Islands NBSAP

Theme C. Ecosystem management			
Goal C. Conserve important ecosystems through a system of protected areas with regulated and monitored activities.			
Actions	Outcomes	Indicators	Comments
a) Establish an independent Suwarrow National Park Authority to administer the Cook Islands' only national park on behalf of all the major stakeholders. A management group with the responsibility to conserve the atoll's wildlife, and to monitor and control revenue-generating activities.	Report prepared with the following recommendations for implementation: • For the consultant to formalize appropriate legislation for the Suwarrow National Park Authority (SNPA); and • A process initiated which results in the Bill's enactment in Parliament. Seabird population re-survey completed for Suwarrow	Report "A Program to Establish the Suwarrow National Park Authority[i]" The status of seabird colonies on the Cook Islands atoll of Suwarrow[ii]. Suwarrow seabird re-survey report[iii].	• Though draft regulations have been prepared, and a resurvey of bird populations has taken place, there has been no further progress on establishing the authority.

[i] (Karika, 2004)
[ii] (Rhys Jones, 2001)
[iii] (Rhys Jones, 2008)

Theme C. Ecosystem management			
Goal C. Conserve important ecosystems through a system of protected areas with regulated and monitored activities.			
Actions	Outcomes	Indicators	Comments
b) Develop a programme to select areas to establish a national system of community-based protected areas to protect important terrestrial ecosystems.	An NBSAP add on consultancy report completed in 2004.	Protected Natural Areas in the Cook Islands within a Proposed National System[i].	• The few terrestrial areas under some form of protection are below CBD targets.
c). Develop a programme to select areas to establish a national system of community-based protected areas to protect important reef and lagoon ecosystems.	A network of marine raui has been established in Rarotonga starting in 1998. There are currently six active raui in Rarotonga. In Aitutaki there is one reserve area, and 3 raui, in addition to the long standing trochus sanctuary. A number of other raui exist on some of the other islands, including Atiu, Mauke, Pukapuka, and Rakahanga. Rarotonga, Aitutaki, Manihiki and Penrhyn lagoons undergo regular monitoring to assess ecosystem health	Some areas of significance identified for *Kaveu*, seabirds, *Paua*, *Maratea* or Humphead wrasse (*Cheilinus undulatus*), parrotfish, sharks, trochus and turtles, under the WWF supported East Polynesian Ecoregion Project. These are far from complete, and are therefore not reproduced in this report. Various reports completed during the 2004 – 2010 period[ii].	• These protected areas combined account for only a small percentage of the inshore areas of the Cooks Islands, reported to be approximately 19 sq.km[iii], which is close to 10% of the reported reef area of 220 sq km. However, to achieve 10 % the entire EEZ of 1. 9 million sq. km. would require an MPA of approximately 200,000 sq.km. • Community and Government are working together with NGOs and donors to improve Takitumu lagoon in an ongoing programme.

[i] (E. Saul & Ana Tiraa, 2004)
[ii] (Anderson et al., 2005; Anderson, Maru, Solomona, Tuatai, & Turua, 2004; George, Tuatai, Turua, & Solomona, 2007; 2009; Solomona, George, et al., 2009; Solomona, Tuatai, Turua, et al., 2009; 2010; Solomona, Turua, George, et al., 2009; Tuatai, Solomona, Turua, & George, 2009; Turua, George, Tuatai, & Solomona, 2009; Turua, Tuatai, George, & Solomona, 2010a; 2010b)
[iii] (Govan et al., 2009)

Table 31 Review of progress towards Goal D of the Equitable Sharing of Benefits and Access to Biodiversity theme of the Cook Islands NBSAP

Theme D. Equitable Sharing of Benefits and access to biodiversity			
Goal D. Ensure that the uses of biodiversity, including genetic resources, bring equitable benefits to relevant stakeholders			
Actions	Outcomes	Indicators	Comments
a) Establish an independent agency to encourage and manage research on biodiversity and its uses, and to ensure that there is an equitable sharing of benefits	No agency as such has been formed. A Cook Islands research committee has been established within the Prime Minister's office. This committee comprises of Govt and some non Govt agencies. The role of the committee is to approve any research that is being carried out in the Cook Islands, including biodiversity.	The best indicator would be "agency established"	• There is a National Research Committee and the biodiversity committee, but this is not an agency. Nothing established by law. • The Conservation Biodiversity unit established within NES in 2009.

Table 32 Review of progress towards Goal E of the Management of Traditional Knowledge to Biodiversity theme of the Cook Islands NBSAP

Theme E. Management of Traditional Knowledge to Biodiversity			
Goal E. Record and maintain records of scientific and traditional knowledge related to biodiversity, with consideration of Intellectual Property Right			
Actions	Outcomes	Indicators	Comments
a) A body should be established to review access to, and the processing of, knowledge on biodiversity and its use, especially medicinal use. This body might be the same as that established to encourage, monitor and manage all research on biodiversity (see Theme D).	As above	As above	• An NGO for traditional medicine practitioners has been established, with members on Rarotonga, Mangaia, Atiu, Mauke and Mitiaro. It currently has 87 registered members. • The Organization's philosophy is that by practicing, the biodiversity will be protected •
b) The programme of the Natural Heritage Project to record all Cook Islands biodiversity with related scientific and traditional information should continue, and it should make such information available to the general public	This is an ongoing activity. See Box 2 in chapter 1.	A database which is regularly updated. Regular informative material on biodiversity developed and disseminated	• The database is currently undergoing modifications. See Box 2, Chapter 1.

Table 33 Review of progress towards Goal F of the Awareness and Education theme of the Cook Islands NBSAP

Theme F. Biodiversity Awareness and Education			
Goal F. Make biodiversity information more readily available to all stakeholders and interested people.			
Actions	Outcomes	Indicators	Comments
a) A working group should be established to investigate ways to ensure that knowledge of biodiversity and its uses is adequately available to students and the general public. b) NGOs should be encouraged to include knowledge of biodiversity where relevant	NES Biodiversity Unit established in 2009 Biodiversity Committee established Terms of reference for a working group were prepared, but this has not been taken any further.	None. A good indicator here would be "Working group established and a work plan in place and being implemented"	• Under the NCSA, a biodiversity committee was established, but is not particularly active. At least one NGO does have a biodiversity committee in its structure. NES has been conducting regular media campaigns on biodiversity.

Table 34 Review of progress towards Goal G of the Mainstreaming theme of the Cook Islands NBSAP

Theme G. Mainstreaming of biodiversity			
Integrate biodiversity into national and sectoral legislation, policies, plans and programmes.			
Actions	Outcomes	Indicators	Comments
A multi-sectoral working group should be established to review the policies and activities of Government ministries and agencies to ensure that they are consistent with a shared responsibility to maintain Cook Islands biodiversity and related knowledge	The NBSAP has been mainstreamed into NES's overall institutional policy document, the National Environment Strategic Action Framework (NESAF) 2005-2009. This in turn has been incorporated into the country's overarching policy, the NSDP (Munro, 2009). Consequently, the Cook Islands have satisfied the 2nd part of Article 6. GEF Small Grant Programme targeting NGOs based its first Country Programme Strategy 2006 - 2008 on the NESAF A draft MOU has been prepared to coordinate efforts across government and civil society	Included as a part of the Cook Islands National Sustainable Development plan (Te Kaveinga Nui) 2006-2010[i]. GEF Small Grant Programme has funded 6 biodiversity projects from 2007 – 2010 valued at US$234,532. One of those has now been completed	• Despite inclusion of the NESAF in the NSDP, there are no monitoring and evaluation mechanisms in place to ensure progress is being made. However, GEF Small Grant programme monitoring mechanisms requires further funding to ensure monitoring and evaluation is carried out. GEF Capacity Building Work Plan, through the Pacific Environment Fund (PEF) has provided funding to cover this aspect of the programme.

[i] (Government of the Cook Islands, 2006)

Table 35 Review of progress towards Goal H of the Financial Resources and Mechanisms theme of the Cook Islands NBSAP

Theme H. Financial resources and mechanisms for biodiversity			
Secure long-term financial sustainability for all biodiversity related activities and programmes.			
Actions	Outcomes	Indicators	Comments
Establish a Biodiversity Trust Fund to support the wide range of activities required to conserve Cook Islands biodiversity in an integrated and equitable manner	No progress. The EPF which could have been used for this purpose, with some legislative and administrative change has been discontinued.	"Trust fund established" would be the indicator	The Departure Tax Amendment Act 2008 resulted in finance allocated to conservation being redistributed to other spending stream is an indication which suggests that Government is not committed to establish funding mechanism of this nature.

Chapter 3: Mainstreaming

Chapter 3: Mainstreaming

3.1 Incorporation of the NBSAP into the National Environment Strategic Action Framework (NESAF)

Mainstreaming of biodiversity, and other aspects of environmental sustainability, is an important concept for the Cook Islands. In an attempt to achieve this, the NBSAP was incorporated into the National Environment Strategic Action Framework (NESAF) for the period 2005-2009.

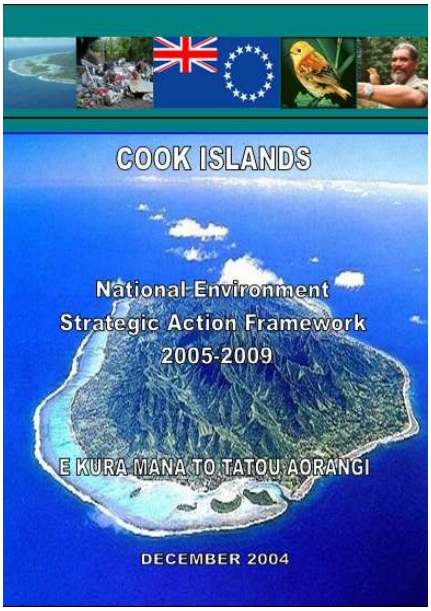


Figure 22 Cook Islands NESAF.
SOURCE: NES

The NESAF was developed as a mandate under the Environment Act 2003, to replace the 1992 NEMS, and became the leading environment policy framework for the period from 2005-2009. It provides guidance and direction to the Cook Islands to protect, conserve and manage its environment and natural resources. Conservation and Management of flora and fauna is accounted for in the framework with a goal to 'Enhance the Management, Protection and Sustainable Use of our Natural Resources'. The NBSAP activities were integrated into the NESAF, under Goal 1, "Enhance the management, protection and sustainable use of our natural resources".

The development of the NESAF was an improvement over the NBSAP as it identified which activities were immediate, medium, and long term priorities, and included 11 performance indicators which would allow progress to be assessed. The NESAF indicators provide some means to measure the progress on the Cook Islands commitments to the CBD. The table below shows the progress of implementation of the NESAF.

The NESAF is to be regularly reviewed and revised. The, National Capacity Self-Assessment study[i] was undertaken to assess national capacity needs in biodiversity, (as well as other priority environmental issues) as an aid towards government implementation of the NESAF programmes[ii]. Using information from this assessment, as well as feedback from a National Environment Forum held in July 2010, a new NESAF for the period 2011 to 2015 is currently being prepared.

Table 36 NESAF Performance Monitoring Indicators for Biodiversity, Species and Ecosystems Conservation

Key Performance indicators:	Progress
Regular periodic reviews and reports including National Assessment Report of the NESAF.	Annual Environment Forums supposed to take place under the Environment Act 2003, but in practice these have been held every 2 to 3 years. Last one was in July 2010, expected to result in a

[i] (Upoko, 2005)
[ii] (Government of the Cook Islands, 2005)

	report reviewing the NESAF by October 2010
National Biosecurity Act adopted by 2006 and Biosecurity agency established by 2008.	Act passed in 2008, which also established the former Quarantine branch of the Ministry of Agriculture as the Biosecurity agency
National Intellectual Property Rights Act and Copy Rights Act adopted and implemented by 2008.	Not achieved. A draft Bill has been prepared and is awaiting finalisation. Some regional work currently underway, sponsored by the Forum Secretariat, which may lead to progress in the near future
Number of identified ecosystems and species with established carrying capacity levels, development guidelines and management plans	Tuna management plan; Environment Takuvaine Water Catchment Regulations 2007 Takitumu Lagoon Management Plan; Manihiki Lagoon Management Plan awaiting Manihiki Island Council endorsement; Takitumu Conservation Area; Draft Suwarrow and Manuae management plans prepared but not finalised; A number Marine Raui management plans were also prepared, but there was no annual review or follow up.
Estimated Areas (size) of contamination by spreading invasive species reduced as a result of effective control.	Despite some attempts to eradicate invasive weeds, in Mangaia, Mauke, and Mitiaro, these have not been successful, and the total areas are likely to have increased since the NBSAP project prepared. There is a need to carry out a monitoring and evaluation on these attempts.
Number of active community and national programmes related to biodiversity protection, conservation and management of various species managed by locals.	TCA, Takitumu Lagoon, Manihiki Lagoon Management Plan (awaiting Island Council endorsement)
Growing number of local enterprises and individuals especially women making an income-generated livelihood from biodiversity and related initiatives. E.g. eco-tourism activities and Maori medicinal practices	No baseline survey or monitoring programme established. Export of *maire* from southern group remains the only export, though tuna exports, pearls, and marine aquarium fish could also be considered a local enterprise reliant on biodiversity.
Increased funding for Natural Heritage Trust programme and employment of local counterparts	No increase in funding received, no local counterpart employed. Environment Fund from airport departure tax discontinued, with funds now going to consolidated Government revenue.
Greater awareness and use of Cook Islands Biodiversity Database	Promoted at several regional workshops and presented as a case study for other countries to follow.
Number of national parks and raui reserves with functional management plans established nationwide, including Rarotonga cloud forest, Suwarrow, Takutea and Manuae	Currently 25, mainly marine. See list of protected areas in Table 24.
National Research Foundation Act adopted by 2006	No progress, though there are two Research Committees established, one under the Government umbrella and the other the Cook Islands Research Association. Both bodies have clear and distinct objectives. The government body regulates and monitors research while the other promotes research

From the information presented above, it can be seen that the most progress has been in meeting the obligations listed in article 7 of the CBD, in relation to identifying the

country's biodiversity. Box 2 (Chapter 1) provides a case study of the development of the Cook Islands Biodiversity Database, which has resulted in much of the progress achieved for Article 7

3.2 Te Kaveinga Nui and National Sustainable Development Plan

In the Ministerial Statement for the NESAF publication in 2004, The Cook Islands Environment Minister at the time, Sir Geoffrey Henry said:

"We have made a beginning by adopting the new National Environment Act in 2003. Having the National Environment Strategic Action Framework linked into the National Development Plan process, the National Millennium Development Goals programme for poverty alleviation, and the World Summit on Sustainable Development programmes is crucial in meeting our national goals and international obligations"

As this statement predicts, the NESAF was subsequently incorporated into the National Sustainable Development Plan for 2007 to 2010 (NSDP). This was a further step in ensuring that mainstreaming of biodiversity considerations was given due consideration in the overall plan for sustainable development in the Cook Islands.

Te Kaveinga Nui is the "Pathway for Sustainable Development in the Cook Islands". It is a general, longer term document setting a broad, over-arching plan for the future development of Cook Islands to the year 2020. It includes a national vision: ***To enjoy the highest quality of life consistent with the aspirations of our people, and in harmony with our culture and environment.*** To live in harmony with your environment is, in essence, to conserve biodiversity.

Te Kaveinga Nui incorporates 5 strategic outcomes for the country. A key part of outcome number 5 related to environmental and cultural values is that by 2020, Cook Islanders will have a "firm respect for our natural environment through increased conservation efforts that are consistent with the principles of sustainable development ensuring the protection of our natural environment for future generations".

The National Sustainable Development Plan 2007-2010 is the workplan of Te Kaveinga Nui in the shorter term. The NSDP has 8 key goals that seek to address the 5 Strategic Outcomes in Te Kaveinga Nui. It is a strategic document that guides national activities and programmes for development. The information contained in this document was generated in a joint effort by the Ministries and Departments within Government, to ensure that they aspire to 3 year targets, goals and indicators for their respective activities. The NSDP attempts to give equal attention to the three pillars of sustainable development

The NSDP also aims to meet the international obligations of the Cook Islands, such as the Millennium Development Goals (MDGs) goal 7 (Ensuring Environmental Sustainability). It identifies 11 strategic priority areas for the Cook Islands to address, one of which is Environment and Natural Resources. The NESAF and The Cook Islands MDG national report of 2005 have therefore been integrated into the NSDP, which includes targets related to biodiversity. Noticeably the social and environmental pillars are not represented on this committee.

The NSDP process is overseen by a committee (now called the National Sustainable

Development Committee), which includes participation from the Office of the Prime Minister (OPM), the Ministry of Financial and Economic Management (MFEM), Ministry of Foreign Affairs and Immigration (MFAI), Crown Law, and the Office of the Public Service Commissioner (OPSC).

A review of progress has been ongoing since 2008 with key consultations with stakeholders being factored into the review process, with the goal to revise and strengthen the next NSDP for 2011 to 2015. This review process includes consultation with key stakeholders such as the general community, private sector, regional and international development partners as well as key donor agencies.

More details on the NSDP targets in relation to biodiversity and their current status are included in Chapter 4.

3.3 Budgetary Support to Biodiversity Conservation

The Cook Islands Budget Policy Statement 2010-2011 states that the Government will support marine and land conservation initiatives. Conservation of Cook Islands marine and land resources is critical for environmental sustainability. In 2010/11 Government will strengthen the institutional arrangements to ensure that the use and harvest of these resources are maintained within sustainable levels. However, despite these statements, the lion's share of the operational budget for biodiversity conservation is sourced from donors. Government resources specifically allocated to biodiversity cover the salary of two dedicated biodiversity officer at the National Environment Service, with other NES staff also contributing at times, particularly in regard to education and awareness raising. Government also provides support to the Natural Heritage Trust, which is responsible for the development and upkeep of the Cook Islands Biodiversity Database. Other Government funding related to the biodiversity sector goes to Ministries of Agriculture and Marine Resources (see below).

3.4 Institutional Frameworks for Biodiversity Conservation

The following section will detail the institutional arrangements in place in both government and civil society to address biodiversity. A narrative is provided for the main arrangements while the section concludes with a table summarizing the roles of the remaining arrangements.

3.4.1 National Environment Service

The Environment Act 2003 is the principal legislation providing a mandate to the NES for biodiversity conservation. It provides national legislation for the conservation and management of Biodiversity as follows:

- Protected Species – Designating animals and plant as protected species for the purpose of this Act.
- Providing for the protection, conservation and management of wildlife, protected species or both.
- Regulating or prohibiting trade and commerce in wildlife, protected species, or both.
- Protected Areas – Establishing Protected Areas and regulating or prohibiting activities within these protected areas.

Despite this legislated mandate, the country has witnessed a progressive dilution of capacity for hands-on conservation management within government. Though the National Environment Service (then the Conservation Service) has grown from an initial staff of 3 in 1988 to number 27 today there are only 2 staff members working full time in the biodiversity sector. Thus the responsible government agency does not have an operational capacity to effectively manage biodiversity. In addition to this, the legislative shift from a conservation focus to an environmental management focus resulted in less attention on conservation activities and more on overall environmental management, including more focus on development monitoring and management.

This vacuum has been filled to some extent by the formation of the Cook Islands Natural Heritage project, though also with a staff of only one. To fill the gap, a number of non-government organisations have become actively involved in biodiversity conservation at the community level. For example the traditional leaders, supported by NGOs, have made progress in the promotion of the raui system (traditional resource management system) for marine conservation[i].

3.4.2 Ministry of Marine Resources

The other Government Ministry with a major role in biodiversity management is the Ministry of Marine Resources, as it is responsible for both inshore and offshore fisheries management. The Marine Resources Act 2005 defines the fishery waters of Cook Islands as the internal waters, territorial sea and exclusive economic zone. It allows the Queens Representative to designate any fishery which is considered important to the national interest or which requires management for ensuring sustainable utilization of the fishery resource. A fishery can only be designated on the recommendation of the Secretary, after taking into account the scientific, economic, environmental and other relevant factors of the fishery in regard to effective conservation and optimum utilization for national benefit. A fisheries plan for each designated fishery is to be prepared by the Secretary of MMR, or by a local authority in conjunction with MMR for a designated fishery within its area.

Designated fisheries have been declared under the Act in Manihiki, for management of the *Parau* fishery in the Manihiki lagoon and the *Ava* fishery in Lake Porea. In Aitutaki, all fish stocks naturally occurring in the lagoon were made a designated fishery in 1990. Following the designation of the respective fisheries, by-laws under the Outer Islands Local Government Act and under the Marine Resources Act were promulgated upon the recommendation of the Aitutaki Local Government Council and, in respect of pearl shell cultivation, upon the recommendation of the Manihiki Local Government Council.

The commercial long line fishery has also been declared a designated fishery, and a management plan has been prepared. This plan includes conservation measures for turtles, sharks, and seabirds, under the International plans for actions under FAO's International Code of Conduct for Responsible Fisheries (CCRF), and also in line with commitments to the West and Central Pacific Fisheries Commission (WCPFC)[i].

[i] (de Romilly, Manarangi-Trott, Matepi, & Tiraa-Passfield, 2005)

3.4.3 Ministry of Agriculture

The Ministry of Agriculture plays a major role in biodiversity conservation, through administering a number of Acts and regulations. These include:

- Biosecurity Act, 2008.
- Copra Act ,1970;
- Wandering Animals Act (24 of 1976);
- Cook Islands Fruit Regulations 1965, (S.I. 146/1954);
- Regulations under *Cook Islands Act 1915* for preventing growth and spread of noxious weeds, 1916 (as amended in 1927, 1931, 1933);
- Regulations under Cook Islands Act 1915 for the protection of indigenous and imported birds and to prevent the introduction of noxious animals and birds into the Cook Islands[i].

The Cook Islands is also a party to a number of international treaties through the Ministry of Agriculture that relate to biodiversity. These include the International Plant Protection Convention (IPPC), which seeks to prevent the spread and introduction of pests of plants plant products and including natural flora, and to promote appropriate measures for their control. Under the IPPC, the Cook Islands are required to regulate the importation of plants and plant products and other objects, materials capable of harbouring plant pests.

The Cook Islands is also a party to The International Treaty on Plant Genetic Resources for Food and Agriculture. This treaty supports the Convention on Biological Diversity, by seeking to conserve, for sustainable use, plant genetic resources for food and agriculture.

It requires the development of national legislation and regulations needed to implement the Treaty.

The Cook Islands has also signed, but not yet ratified, the Cartagena Protocol on Biosafety to the Convention on Biological Diversity[i].

The Ministry under its FAO funded programme will be working with the MFEM's Statistics Division to update its 2000 Agricultural census. This update will have an important role, and can provide information for monitoring purposes especially to monitor the following changes: the area used for agriculture on all the islands; the type of crops planted; the role of women in agriculture; livestock farming and waste disposal systems used; access to water supply; the use of chemicals and inorganic/organic fertilizers; the use of natural resources for traditional and modern agriculture; and access to technology related to agriculture[ii].

[i] (de Romilly, Manarangi-Trott, Matepi, & Tiraa-Passfield, 2005)
[ii] Nooroa Tokari, pers comm., 2010

3.4.4 Non Government Organizations

The number of environmental NGOs has increased since 2002 from four known NGOs to six in 2010 (Table 37). Several of these organisations have been instrumental in the implementation of programmes such as the protected areas programme (e.g. House of Ariki[i], Koutu Nui[ii], WWF and Te Ipukarea Society).

Te Vaka Taunga – Te Rito O Te Vairakau Maori has taken on the role of addressing the protection and conservation of medicinal plants by encouraging their members to practice their medicine, and are, through their members, working on chemical free weed control. The organisation's main focus is to protect practitioners and their knowledge, which should have a flow on effect for the benefit of biodiversity.

There is a lack of recognition of women's role in the use of local biodiversity, e.g. for crafts, and household food expenditure. The 2010 Cook Islands National Council of Women Conference addressed the roles that women play in the use and conservation of biodiversity.

[i] Formal body of paramount chiefs
[ii] Formal body of chiefs

Table 37 Summarised table of the Roles and Legal Instruments of Biodiversity Stakeholders in the Cook Islands. SOURCE: (de Romilly, Manarangi-Trott, Matepi, & Tiraa-Passfield, 2005)

Institutions	Legal Status	Management Framework	Current Status
National Environment Service	Environment Act 2003	Implementing Agency administering Environment Act 2003	The following provisions of the Act relate to the conservation and management of flora and fauna: • Protected Species – Designating animals and plant as protected species for the purpose of this Act. • Providing for the protection, conservation and management of wildlife, protected species or both. • Regulating or prohibiting trade and commerce in wildlife, protected species, or both. • Protected Areas – Establishing Protected Areas (which may include any protected areas notified under section 41) and regulating or prohibiting activities within these protected areas. The NBSAP add on was the latest major biodiversity programme within NES. To a lesser degree other projects and programmes also deal with flora and fauna such as compliance, education and International Waters Project.
Natural Heritage Trust	The Cook Islands Natural Heritage Trust Act 1999 establishes the Cook Islands Natural Heritage Trust	The Act provides the necessary resources and powers to investigate, identify, research, study, classify, record, issue, preserve and arrange publications, exhibitions, displays and generally educate the public on the science of, and traditional practices and knowledge relating to, the flora and fauna of the Cook Islands	The goal is to encourage the protection of the natural environment and associated traditional knowledge by an increased awareness of Cook Islands plants and animals, and related traditional and scientific knowledge. Its policy objective is to collect and preserve scientific and traditional information on plants and animals, and make this information available to the public. The Cook Islands Biodiversity data base is the principal source of information of plants, animals, including marine species in the Cook Islands.

Institutions	Legal Status	Management Framework	Current Status
Ministry of Agriculture	The Ministry of Agriculture Act of Parliament in 1978 Biosecurity Act 2008	The Act defines the functions of the Ministry. The Act prevents, controls, regulates animal and plant pests and diseases into the Cook Islands	The principal aim of the Ministry of Agriculture is to maximize exploitation of the potential in agriculture to advance the economic, social and environmental aspirations of the country. Biosecurity and quarantine are the main areas where Agriculture has a role in flora and fauna conservation.
Ministry of Marine Resources	Marine Resources Act of 2005 Signatory to West and Central Pacific Fisheries Convention (WCPFC)	Responsible for fisheries management and development	The MMR's role is primarily monitoring, advisory, consultative and regulatory in nature. Its programmes are closely linked with those islands and communities that have significant marine resources and sectors exploiting or utilizing the resources. The Ministry provides technical assistance in water quality testing, monitoring of marine *raui* on Rarotonga and Aitutaki and preparation of management plans for the sustainable development of marine resources. As a member of WCPFC, MMR is responsible for applying agreed Conservation and Management Measures (CMMs) related to the highly migratory fish stocks, particularly tunas, billfish, sharks, and turtles.
Koutu Nui	The Koutu Nui was established under the House of Ariki Act 1966	A separate advisory body for traditional leaders. Concerned with: environment, land preservation and conservation of resources (especially biodiversity), and the welfare of the people;	Initiated the reintroduction of the *raui* around Rarotonga lagoon Koutu Nui has frequently expressed interest in strengthening the Raui.
Cultural and Historical Places Trust	Cultural and Historical Places Act (40 of 1994-95)	Responsible for the designation and protection of cultural and historical site. Administered by the Ministry of Cultural Development.	No requirement that conservation and management plan be developed and implemented for any historic place under the control of the Trust
Outer Islands	The Outer Islands Local Government Act 1987 Island Councils by-laws	Island Council enforces any by-laws they have made related to conservation	The Island Council has the mandated authority to enact environmental management By-laws. However, the current bureaucratic system of enacting by-laws combined with the Island Council's lack of knowledge on procedures has resulted in very few new strictly environmental bylaws being established.

Institutions	Legal Status	Management Framework	Current Status
National Research Committee	No legal mandate	The OPM is the Secretariat for the National Research Committee.	The National Research Committee grants and maintains a registry of research activities being undertaken in the Cook Islands. Any study relating to biodiversity requires a permit from the National Research Committee to undertake such research.
Cook Islands Research Association	Established in 2007 as an Incorporated Society	It has a President and two Vice Presidents, a Secretary and Treasurer and they for the Executive Committee who makes the decisions and plans of the Organization.	Have an annual conference where it invites local and visiting researchers to present their work. Have attracted up to 200 members.
Te Ipukarea Society	Cook Islands incorporated environmental NGO	The operation of TIS is governed by a constitution. The executive committee is the decision making body.	TIS are active in the areas of advocacy, public education and awareness, campaigns, biodiversity, waste management, climate change and coastal management. Recently obtained funding under the Critical Ecosystems Protection Fund for a coordinator and activities related to bird conservation.
Takitumu Conservation Area(TCA)	A conservation committee of representatives of three landowning families. A resource owners association not incorporated.	The Takitumu Conservation Area (TCA) is an area managed by representatives of the three land-owning families and administered by a TCA manager.	Main activities are currently the Kakerori Recovery Programme (KRP) which operates from August to March of each year and ecotourism nature walks. Funds from ecotourism help in the management of the TCA and implementation of the KRP.
Cook Islands National Council of Women	Incorporated under the Incorporated Societies Act in 1984	The operation of the Organization is governed by its Constitution. It has a President, 2 vice Presidents, a general secretary, general treasurer and Trustees. It is an umbrella Organization.	The Organization has 26 members and affiliated members. It has recently assisted one of its members to apply for funding from the Global Greengrant Fund to put together a project proposal to obtain Taro shoots from the SPC gene bank in Fiji. The Organization also supports its members in activities that ensure sustainability of crafts resources.

Institutions	Legal Status	Management Framework	Current Status
Te Vaka Taunga – Te Rito O Te Vairakau Maori	Registered as an Incorporated Organization in 2000	The operation of the Organization is governed by its Constitution. The Constitution, written in the Cook Islands Maori Language established a Management Committee under the guidance of a Manager. An executive Committee is the decision making body.	Current membership covers the islands of Rarotonga, Mangaia, Atiu, Mauke and Mitiaro. It currently has 87 registered members. The Organization main aim is to protect the practitioners and their medicine by encouraging them to practice. The Organization's philosophy is that by practicing, the biodiversity will be protected.
Te Rito Enua	Te Rito Enua was originally a community based organisation that evolved in support of WWF's Te Kaveinga Ora no te Aorangi environment education program. It was formally registered under the Incorporated Societies Act in October 2009 as a not-for-profit organisation with a conservation mandate, filling the gap created by WWF's exit from the Cook Islands in the same year.	Te Rito Enua has an Executive Governing Board that monitors and approves its activities and a Technical Advisory Panel of five local, regional and international experts in natural resources management, policy, institutional strengthening and climate change. For its day to day management, TRE has a CEO and a part-time Administrative Assistant/Finance Officer on its staff with a roster of local volunteers as needed.	Te Rito Enua completed its first successful project, Managing Climate Change Risks in Vulnerable Communities at end of 2010. The pilot project for empowering communities in adaptation planning was implemented in Aitutaki and Rarotonga. The ADB is undertaking the final publication of the report with potential replication of the project in other communities in the Pacific region.
Island Sustainability Alliance Cook Islands [ISACI]	Cook Islands environmental incorporated NGO.	The operation of ISACI is governed by a constitution. The executive committee is the decision making body.	Newly established in 2006 with a mandate to promote organic farming.

3.5. Success of Mainstreaming

Despite the efforts reported on above in relation to mainstreaming biodiversity concerns, this has largely remained at the policy level, and has not been translated to many activities on the ground targeting CBD obligations. This is something that needs to be addressed in future revisions of the NESAF. Box 7 provides a case study of mainstreaming of biodiversity in the Cook Islands which was presented at a regional workshop in Fiji in 2009.

Box 7. Case study on Mainstreaming Biodiversity in the Cook Islands

The Cook Islands National Environment Strategic Action Framework 2005 – 2009. A tool to mainstream Environmental Management into various sectors of society[i].

Background

The Cook Islands National Environment Strategic Action Framework was designed to recognize the significance of sustainable development as we begin to come to terms with issues such as biodiversity changes, changing weather patterns, unchecked tourism development, increasing waste and contaminated lagoons, as well as struggling infrastructure and utility services.

This Framework is linked to the National Environment Act 2003 and to following National Guiding Documents
–National Sustainable Development Plan
–National Millennium Development Goals
–Draft Tourism Master Plan
–National Action Plan for Disaster Risk Management
–Biosafety Framework

The NESAF replaced the 1992-93 NEMS as the leading policy framework and was developed to empower communities, which is crucial to the successful implementation of this Strategy.

Pre NESAF the approaches to environmental management were sectoral based and most people considered "*environment*" to be the NES responsibility alone. Many activities were uncoordinated at the national level and often replicated. The NESAF has assisted in streamlining Government activities in the Environment arena, and has assisted NES in its government business plan priorities. It is recognized that for effective implementation, the NESAF must have "grassroots" community buy-in.

Status

Positive	Negative
The framework is widely promoted and distributed across sectors	Those promoting issues need to be vigilant and pro-active to make sure they get reflected in the different sectoral and national planning systems
There is an avenue for regular improvement through NESAF reviews	Inadequate monitoring or evaluation means of progress across sectors
EIA process allows for biodiversity consideration in the assessment process	Some systems i.e. EIA are too limited to project sites and cumulative effect not assessed over time
Led to establishment of Biodiversity Unit within NES	Need for monitoring and evaluating implementation means and progress across

[i] Adapted from a presentation by Elizabeth Munro (Munro, 2009).

	sectors
Draft MOU and Programme of Work for implementation with key stakeholders, and able to use plans to justify budget requests	Insufficient allocation of resources to implement what has been mainstreamed. Limited opportunities to harness support for mainstreamed activities during budgetary processes
Mainstreaming promotes partnership and engagements with other sectors	Extent of mainstreaming is limited and only pertains to where it is part of core functions
There is a comprehensive database in place for the Cook Islands	Database information gaps, population and spatial distribution of species and functional values of ecosystems information lacking
Knowing the issues and identifying the players makes it easier to mainstream	Reflection of mainstreaming in sectoral policies does not always mean implementation

Issues and recommendations

While there are linkages within NESAF to all these sectoral plans, and key players identified, this has only been on paper, and not translated to real implementation. The environment sector is trying to mainstream biodiversity with other sectors but these environment issues are not being taken up by the other sectors mainly due to it being outside their core functions and budget appropriations and performance being dictated by core functions. The widely dispersed geographic characteristic of the country, together with limited capacity and high transport costs, makes it difficult to effectively involve many of the outer islands. There is also a lack of incentives and no communication strategy to engage sectors such as tourism to take on biodiversity related work. There is a need for capacity building programmes to reach out to the outer islands, as well as a monitoring and evaluation plan for implementation across sectors. There is also a need for an overall mechanism to oversee and monitor progress on mainstreaming effectiveness at the national and sectoral levels.

Chapter 4: Progress Towards the 2010 CBD Targets

Chapter 4: Progress Towards the 2010 CBD Targets

4.1 Overall Assessment of Progress Towards the 2010 Targets.

The CBD Conference of the Parties number 7 (COP 7) held in Malaysia in 2004, agreed to establish goals and sub-targets for each of the 7 identified focal areas of the Strategic Plan for the CBD. This was to clarify the 2010 Biodiversity Target and promote consistency among the programmes of work of the Convention by providing a flexible framework within which national and/or regional targets may be developed. This would allow for national priorities and capacities, and differences in diversity between countries, to be considered, facilitating the incorporation of relevant CBD goals and targets into national plans, programmes and initiatives, including national biodiversity strategies and action plans[i].

There are 11 goals with associated sub-targets identified to be achieved by 2010. While the Cook Islands converted these into their own NBSAP, which, as stated in Chapter 3, was subsequently incorporated into the National Sustainable Development Plan 2007-2010, it is still useful to try and see how the Cook Islands have gone with meeting the specific targets established at COP 7. The following tables 38 to 44 provide such an assessment. The tables have been colour coded to provide at a glance an indication of the progress on each of the identified activities. Green indicates relatively good progress, with some major accomplishments, orange refers to activities with limited progress, and blue indicates very little or no progress. Table 45 provides more information on how these have been incorporated into the NSDP, and the associated progress. The National Sustainable Development (NSD) committee, with representatives consisting from the Office of the Prime Minister (OPM), Ministry of Finance and Economic Management (MFEM) Ministry of Foreign Affairs and Immigration (MFAI), the Office of the Public Service Commissioner (OPSC) and Crown Law, are currently overseeing a review, which includes consultations with all stakeholders, to strengthen the next NSDP.

[i] (CBD, 2004)

Table 38 Progress made towards Goals 1, 2, and 3 of the 2010 CBD targets

Goals and targets	Progress	Assessment
Protect the components of biodiversity		
Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes		
Target 1.1: At least 10% of each of the world's ecological regions effectively conserved.	• Takitumu conservation area, Suwarrow Islets, and the Nikao Social Centre are the only land areas conserved, which is much less than 10%. • Combined marine *raui* probably less than 10%, though some quantitative analysis required not completed. • Eastern Polynesian Ecoregional analysis, supported by WWF, has collected relevant information which can be used to progress the Programme of Work on Protected Areas (PoWPA)[i].	Not achieved
Target 1.2: Areas of particular importance to biodiversity protected	• Some key biodiversity areas have been provided some protection e.g. Suwarrow, Takutea, Takitumu Conservation area, marine *raui* areas, O'otu reserve. • Some spawning aggregation sites and breeding sites for marine species identified[i] • Internationally funded project to identify and document important bird areas started in 2010	Partially achieved
Goal 2. Promote the conservation of species diversity		
Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.	• Successful recovery of *Kakerori* (Rarotongan flycatcher. See Box 2) • Relocation of *Kakerori* to Atiu • Reintroduction of *Kura* to Atiu • *Paua* reseeding in Aitutaki • Relevant government ministries and NGO's have conducted television and other media campaigns to raise awareness of biodiversity, particularly during 2010, the International Year of Biodiversity	Partially achieved The relocation to Atiu is an activity that supports Article 9 of the CBD related to *ex situ* conservation. Media used effectively to raise awareness of Cook Islands biodiversity

[i] (Anon, n d)

Goals and targets	Progress	Assessment
Protect the components of biodiversity		
Target 2.2: Status of threatened species improved.	• *Kakerori* graduated from critically endangered to endangered, and security population translocated to Atiu. • Security population of endangered *Kura* established on Atiu.	Achieved These activities support Article 9 of the CBD related to ex situ conservation.
Goal 3. Promote the conservation of genetic diversity		
Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.	There have been a number of activities related to target 3.1. Those that have achieved significant results are listed as bullet points below. Cook Islands biodiversity database represents significant progress. • Capacity and needs assessment completed for Mangaia and Mitiaro on the status of rare plants used in traditional medicine (*Vairakau Maori*). Five islands (Rarotonga, Mauke, Mangaia, Mitiaro and Atiu) have now formed their owned Organization for traditional medical practitioners affiliated under the umbrella organization Te Vaka Taunga – Te Rito O Te Vairakau Maori. • Taro growers continue to plant taro and coconut using the conventional selection process. Shoots that have tested positive to resistance to known pests by the Min. of Agriculture have been shared between farmers. • Legislative review for the development of a national biosafety framework completed in 2004 • Biosecurity section within Ministry of Agriculture established. • A number of research studies completed for a variety of terrestrial and marine species.	Target partially achieved. Biosafety regulations to meet article 19 of CBD still need to be developed.

Table 39 Progress made towards Goal 4 of the 2010 CBD targets

Goals and targets	Progress	Assessment
Promote sustainable use		
Goal 4. Promote sustainable use and consumption.		
Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.	• Marine ornamental trade continued on a sustainable basis for over 20 years, but now decreased due to marketing difficulties and overseas competition. • Cook Islands are a member of the West and Central Pacific Fisheries Commission, and supports and abides by the Conservation and Management Measures agreed to by the Commission. • *Maire* harvests in Mauke, Mitiaro, and Mangaia have declined in recent years. • Pearl farming a significant part of the economy, and is recovering after major setbacks caused by disease outbreak in Manihiki and poor pearl prices. • Periodic trochus harvests. Though an introduced species, no evidence of adverse effects. • Handicrafts made from pearl shells, coconut fronds, Pandanus, terrestrial snails etc appear to continue on a sustainable basis. • *Rawui* on Pukapuka facilitate sustainable use of natural resources Managed harvests of red tail tropic bird juveniles have been ongoing on Palmerston Atoll for more many years.	Partially achieved. Some inshore and offshore fisheries ecosystems require improved management. NES media campaign helped raise awareness of the link between biodiversity in livelihoods.
Target 4.2. Unsustainable consumption, of biological resources, or those impacts upon biodiversity, reduced.	• Banning of export of *Paua* from Penrhyn and Manihiki. • Introduction of marine raui on Rarotonga and other islands, to reduce impact of overfishing • Licensing system for longline and other fishing vessels. • Quota systems for trochus and a permanent trochus reserve in Aitutaki • Raui on Rarotonga and other islands help control unsustainable consumption.	Partially achieved
Target 4.3: No species of wild flora or fauna endangered by international trade.	• No Cook Islands species considered to be in danger from international trade	Not applicable

Table 40 Progress made towards Goals 5, 6, and 7 of the 2010 CBD targets

Goals and targets	Progress	Assessment
Address threats to biodiversity		
Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.		
Target 5.1. Rate of loss and degradation of natural habitats decreased.	• Under the Environment Act 2003, EIAs are required if a project activity causes or is likely to cause significant environmental impacts. However achieving the desired results are still limited, due to lack of effective monitoring and enforcement, and some landowners continue to develop their land inappropriately. • Public Health (Sewage) Regulations 2008 in force to help improve water quality in Rarotonga's lagoon, particularly in Muri lagoon. However, significant additional capacity is needed to enforce the regulations with respect to existing sewage system installations. • Takitumu lagoon management plan. • Takuvaine water catchment area management plan and regulations.	Target partially achieved. Guidelines and standards for EIAs need to be developed.
Goal 6. Control threats from invasive alien species		
Target 6.1. Pathways for major potential alien invasive species controlled.	• Biosecurity Act 2008 in force. • All vessels entering the Cook Islands require a Biosecurity Clearance • Discharge of ballast water in the Cook Islands illegal under Biosecurity Act 2008. • MoA Research Division has developed a network throughout the islands, in order to be advised of any new pests, and a threat analysis is conducted and appropriate action is initiated.	Partially achieved. Biosecurity service in place. Introduction of marine invasives more difficult to monitor

Goals and targets	Progress	Assessment
Address threats to biodiversity		
Target 6. 2. Management plans in place for major alien species that threaten ecosystems, habitats or species.	• Guidelines developed by the Ministry of Agriculture to manage agricultural invasive species. • Rat control in the Takitumu Conservation Area, Rarotonga, ongoing for more than 20 years • Myna bird control programme established in Atiu to facilitate successful translocation of Rimatara lorikeet and kakerori • There have been other invasives control activities, e.g. invasive weed removal initiated in Mangaia, Mauke, and Mitiaro, with little success to date. • Awareness and border security activities for other invasives such as cane toads and giant African snails and fruit fly, etc. • Under Biosecurity Act 2008, vessels are not to discharge ballast water in the Cook Islands however monitoring and enforcement is difficult. • A regional GEF PAS project proposal has been submitted for a regional invasives programme, in which the Cook Islands will be involved	Partially achieved
Goal 7. Address challenges to biodiversity from climate change, and pollution		
Target 7.1. Maintain and enhance resilience of the components of biodiversity to adapt to climate change.	• Translocation of *Kakerori* to Atiu • Translocation of *Kura* to Atiu • Climate change adaptation plans for agriculture include identification of crops resistant to climate change impacts. • Several other relevant activities are in the planning stages	Partially achieved The relocation of kakerori and Rimatara Lorikeet to Atiu are activities that support Article 9 of the CBD related to ex situ conservation.

Goals and targets	Progress	Assessment
Address threats to biodiversity		
Target 7.2. Reduce pollution and its impacts on biodiversity.	• Biosecurity Act controls dumping of waste and discharge of ballast water from vessels. • Ministry of Transport administers the Prevention of Marine Pollution Act 1998 • Ministry of Health administers Public Health (Sewage) Regulations 2008 but significant additional capacity is needed to enforce the regulations with respect to existing sewage system installations • Environment Act prevents the pollution of Cook Islands Waters and the control of litter • Solid waste management facilities established on Rarotonga and Aitutaki • A number of recycling initiatives started on many islands	Partly achieved

Table 41 Progress made towards Goal 8 of the 2010 CBD targets

Goals and targets	Progress	Assessment
Maintain goods and services from biodiversity to support human well-being		
Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods		
Target 8.1. Capacity of ecosystems to deliver goods and services maintained.	• Marine raui established on Rarotonga and some other islands, with spillover effects expected. • Management Plan and Regulations passed for Takuvaine Water Catchment Area. • Takitumu Lagoon Management Plan aims to improve the ecosystem around that area. • Foreshore and Cook Islands waters are protected under part 8 of the Environment Act 2003.	Partially achieved
Target 8.2. Biological Resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained.	• See 4.1	Partially achieved

Table 42 Progress made towards Goal 9 of the 2010 CBD targets

Goals and targets	Progress	Assessment
Protect traditional knowledge, innovations and practices		
Goal 9 Maintain socio-cultural diversity of indigenous and local communities		
Target 9.1. Protect traditional knowledge, innovations and practices.	• Cultural Places Act • Documented and published report on traditional knowledge relating to the different phases of the moon[i] • In 2009, Cook Islands became a party to the Convention concerning the Protection of the World Cultural and Natural Heritage • Five islands (Rarotonga, Mauke, Mangaia, Mitiaro and Atiu) have now formed their own organization for traditional medical practitioners to affiliate under the umbrella organization, Te Vaka Taunga – Te Rito O Te Vairakau Maori. All members of the organization are encouraged to practice their medicine openly. As of June 2010, the umbrella organization has 87 members. The umbrella Organization is in the process of looking into suitable legal arrangements to allow the practitioners legal status as well as recognizing this traditional practice and knowledge.	Partially achieved
Target 9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing.	• The NESAF included a related target, i.e. National Intellectual Property Rights Act and Copy Rights Act adopted and implemented by 2008. Some regional work currently underway, sponsored by the Forum Secretariat, which may lead to completion in the near future • Draft Biological Research protocols developed • Draft Access and Benefit Sharing Act developed	Partially achieved.

[i] (Teariki Rongo, 2006)

Table 43 Progress made towards Goal 10 of the 2010 CBD targets

Goals and targets	Progress	Assessment
Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources		
Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources		
Target 10.1. All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions.	• The National Research Committee at the Office of the Prime Minister screen and assess all in-coming research to ensure national returns and benefits. Measures will be taken to incorporate contractual arrangements between parties especially for material taken out of the country and on-going charges for the use of materials	Partially achieved
Target 10.2. Benefits arising from the commercial and other utilization of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions	• See 9.1 and 9.2. to be further determined, as of present, benefit sharing has been limited to the sharing of research results	Not achieved, see 9.2

Table 44 Progress made towards Goal 11 of the 2010 CBD targets

Goals and targets	Progress	Assessment
Ensure provision of adequate resource		
Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention		
Target 11.1. New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20.	• Critical Ecosystems Partnership Fund • GEF Small Grants finance some community biodiversity conservation activities. • GEF-PAS funds pending • PoWPA funds activities in protected areas and conservation areas. • EU funds for Muri lagoon. • NZAID finds for Takitumu Lagoon Management.	Partially Achieved – unless funds are sourced through the finance mechanism of the CBD, our economies of scale makes attracting other sources of funding dedicated for biodiversity activities, including major NGO's, difficult
Target 11.2. Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4.	• Some GIS mapping technology available, but access is difficult and costly • Whale and Turtle satellite tagging in Cook Islands waters. • Innovative sewage systems promoted to improve lagoon water quality in Takitumu area	Partially achieved – see above

Table 45 Targets relevant to the CBD that have been incorporated into the NSDP, under Goal 4. Sustainable Use and Management of our Environment and Natural Resources Strategies

Strategy	Key Strategic targets 2007-2010	Responsible agency	Progress
Strengthen Cook Islands Marine Resources Strategy	• Review the Ministry of Marine Resources Corporate Plan by the end of 2008.	Ministry of Marine Resources	Draft corporate plan 2009-2012 completed, but not yet signed off. This includes in outcome 4, Ensuring sustainable fishing and conservation practices resulting in long term food security
Sustainable Ecosystem Management of Inshore Fisheries, and increased community management of the resource.	• Develop and implement Inshore Fisheries and Integrated Coastal Zone Fisheries Management in partnership with key stakeholders by 2008 including strategies for: • Increasing by 25% the area of well managed community based Raui initiatives by 2010; • Developing effective inshore fisheries information system; and • Developing and implementing inshore fisheries based policy and legislation by 2010.	Ministry of Marine Resources	Aitutaki lagoon fishery is a "designated fishery" Aitutaki Bonefish Management Plan submitted to cabinet for endorsement Takitumu Lagoon Management Plan in place, and reviewed annually. Manihiki Pearl Farming code of conduct in place and MMR conduct 6 monthly pearl farm inspections A number of ra'ui in place in Rarotonga and some outer islands, but this does not represent a 25% increase since 2007.

Strategy	Key Strategic targets 2007-2010	Responsible agency	Progress
Develop and implement Offshore Fisheries Development/Management Plan in partnership with Tuna Industry Association and other stakeholders	• Produce and implement the Cook Islands Offshore fisheries management plans including management objectives, fishing strategies, research, monitoring and compliance. • Prepare and implement the Offshore Fisheries Industry Development Plan for marketing, product development and capacity building in partnership with the • Fishing industry and stakeholders by the end of 2007. • Establish certification and sanitary systems to enhance market access to international markets.	Ministry of Marine Resources	Tuna management regulations 2008 completed, currently under review
Increase profitability of pearl farming	• Support the Pearl Authority to produce an industry development/recovery plan. • Develop and implement management plans for each pearl farming community based on an ecosystem approach to management. • Promote research and implement management decisions using improved knowledge and information, to improve profitability.	(Ministry of Marine Resources) (Pearl industry, pearl farming communities)	Manihiki pearl farming code of conduct implemented, to maintain sustainability of the lagoons resources. Rakahanga lagoon management plan still in draft form. Pearl farming has declined in Penrhyn over the past 10 years.

Strategy	Key Strategic targets 2007-2010	Responsible agency	Progress
Review and reform land use and zoning policies and supporting structures to reflect better resource ownership, the economic needs of the people and environmental sustainability.	• Develop long-term land use policies through a process of consultation and negotiation by 2009 that will determine zoning areas for, amongst others, Biodiversity and environmental protection;	Ministry of Justice, National Environment Service	Not achieved –The current approach to this strategy is perceived as unachievable, as it appears to be too controversial for the Ministries to work on due to customary land tenure systems. A fresh approach is required if progress is to be made.
Implement National Environment Strategic Action Framework	• Implement immediate priorities listed in NESAF in relation to each of the broad thematic areas such as biodiversity conservation, waste and climate change relevant to land, freshwater and marine resources by the end of 2007. • Implement short-term priorities listed in NESAF in relation to each of the broad thematic areas such as biodiversity conservation, land, waste and climate change relevant to coastal zone and freshwater resources by 2010.	National Environment Service	See progress table on NESAF implementation in Chapter 2. The NESAF is currently under review for the period 2011-2014.
Develop Resource Use and Environment Strategic Action Framework for each of the outer islands	• Develop and implement Resource Use and Environment Strategic Action Framework for at least three outer islands (Aitutaki, Mitiaro & Atiu) by the end of 2007. • Develop and implement Resource Use and Environment Strategic Action Framework for other outer islands by 2010.	National Environment Service	NESAF, currently under review. Environment regulations and by-laws are in place for Mauke, Mitiaro and Atiu/Takutea with draft regulations for Aitutaki undergoing further consultation NESAF

Strategy	Key Strategic targets 2007-2010	Responsible agency	Progress
Strengthen national capacity in biosecurity	• Develop and implement National Biosecurity Strategy for reducing the risk of introduction of foreign plant and animal pests and diseases and the risk of their spread and establishment in the Cook Islands, through community awareness, improved quarantine services and border control, and other technical and institutional control mechanisms in 2007.	Ministry of Agriculture	Biosecurity act 2008
Improve institutional coordination, support and implementation mechanism for managing natural resources and environment in an integrated and sustainable manner	• To implement and adequately resource the Cook Island Environment Act and associated regulations, to provide legislative basis and institutional capacity for increasing the coordination of cross-sectoral sustainable development issues.	National Environment Service	NESAF reviewed and in the process of being updated for 2011-2014. Cook Islands Marine Resources Institutional Strengthening project completed, incorporating Marine Resources, National Environment Service, Ministry of Health, and community organisations in addressing marine impacts. Water Safety Plan completed Integrated Water Resource Management plan being developed

Conclusion

Though on a global scale, some could consider the biodiversity of the Cook Islands as being relatively poor, but it is from this meagre assortment of species that Cook Islands people have developed a culture, a lifestyle and a uniqueness that deserves as much right to survival as the diversity of the Amazon rainforest or the Savannahs of the African continent.

The Cook Islands recognises that in order to protect biological diversity we must first understand what biological diversity is present. To this end the Cook Islands have made considerable progress on documenting its diversity and will continue to do so into the future. The Cook Islands Biodiversity Database has enabled people all over the Cook Islands, and abroad, to read, hear, watch and learn about our distinctive biological diversity.

The Cook Islands has many obstacles to overcome in order to ensure the protection of biological diversity. Having identified the direct and indirect threats and the institutional capacity gaps in addressing biological diversity, a foundation for progress has been laid. On top of this foundation, the Cook Islands hopes to address mainstreaming the protection of biological diversity through establishing a National Biodiversity Strategy and Action Plan which feeds into a broader National Environment Strategy Action Framework. To further empower these strategies and actions, the Government of the Cook Islands has made national commitments to biological diversity in its National Sustainable Development Plan. Although there are mechanisms in place designed to facilitate mainstreaming, the desired outcomes have not always eventuated. There is an identified need for better coordination of activities and a strengthened approach to engage relevant stakeholders. The institution of the Biodiversity Conservation Unit within the National Environment Service aims to coordinate and document progress towards biological diversity targets and identify weaknesses in its approach and work with stakeholders to remedy these concerns.

The National Biodiversity Strategy and Action Plan is still an excellent tool for identifying actions, and its inclusion in the National Environment Strategic Action Plan has resulted in the establishment of measurable indicators and targets, there is still a need to address the integration of Biodiversity and Climate Change, it is envisaged that this will occur with the NBSAP review.

Overall, the Cook Islands have made considerable progress in meeting its obligations under the CBD. Of the 11 goals, the Cook Islands have progressed on all of them with the exception of goal 1, target 1.1. The Cook Islands is considering action to address the designation of marine protected areas to meet this target, however for a nation with limited land area, meeting the terrestrial target is proving difficult. The Cook Islands have successfully achieved progress towards goal 2, target 2.2 with the *Kakerori* (*Pomarea dimidiata*) IUCN downgrading from critically endangered to endangered and an insurance population being established on Atiu. An issue with progress that the Cook Islands need to address is not the lack of progress, but in identifying and documenting where progress has been made. Institutional arrangements within the National Environment Service hope to address this issue.

Biological diversity is not the realm of scientists and conservationists but touches on the livelihoods of all Cook Island citizens. It is from this fabric that we feed, house, clothe, teach and thrive as a unique culture. The conservation of plants and animals is not the responsibility of governments and environmental NGO's but the responsibility of every community, every family, every individual and the right of Cook Islander to come. This land was given to us by our ancestors and it is our obligation to pass it on to our children in at least the same state in which we received it.

References

Adamson, A. M. (1932). Review of the fauna of the Marquesas Islands and discussion of its origin. *Bernice P. Bishop Museum Bulletin*, *159*, 21. Retrieved March 8, 2011, from http://hbs.bishopmuseum.org/pubs-online/pdf/bull159.pdf.

Albar, G., Doukas, T., Chong, F., & Gouni, A. (2009). *Programme de conservation du Lori de Kuhl et suivi des effectifs de Rousserolles de Rimatara en 2009* (pp. 1-30). Tahiti, Polynesia francaise. Retrieved March 26, 2011, from http://onawingandaprayer.net/files/Download/Albar Doukas Chong Gouni 2009 Vini kuhlii.pdf.

Anderson, J., Brider, J., Rice, M., Solomona, D., Tuatai, T., & Turua, T. (2005). *Water Quality Programme - Rarotonga and Aitutaki Lagoons: January 1st - March 31st 2005*. Rarotonga, Cook Islands.

Anderson, J., Maru, P., Solomona, D., Tuatai, T., & Turua, T. (2004). *Water Quality Programme Rarotonga and Aitutaki Lagoons January - March 2004*. Rarotonga, Cook Islands.

Anon. (n.d.). *East Polynesia Ecoregion: unpublished summary of outcomes of the biovisioning process, conducted over 2 workshops in 2010 (April and December)*. Rarotonga, Cook Islands.

Baker, J., Littnan, C., & Johnston, D. (2006). Potential effects of sea level rise on the terrestrial habitats of endangered and endemic megafauna in the Northwestern Hawaiian Islands. *Endangered Species Research*, *2*, 21-30. doi: 10.3354/esr002021.

Brook, F. J. (2010). Coastal landsnail fauna of Rarotonga, Cook Islands: systematics, diversity, biogeography, faunal history, and environmental influences. Wellington, New Zealand.

Brook, F. J., Walter, R. K., & Graig, J. A. (2010). Changes in the terrestrial molluscan fauna of Mitiaro, southern Cook Islands. Wellington, New Zealand.

Brownlie, G. (1965). *The geographical affinities of the south Pacific island fern floras*. *Society*. University of Hawaii Press. Retrieved March 7, 2011, from http://scholarspace.manoa.hawaii.edu/handle/10125/4413.

Butler, D. J. (2003). *Government of the Cook Islands Enabling Activity Biodiversity Project Evaluation Report (NBSAP) CKI/98/G31*. Apia, Samoa.

CBD. (2004). Decisions adopted by the Conference of the Parties to the Convention on Biological Diversity at its seventh meeting. UNEP/CBD/COP/7/21/PART2.

Chazeau, J. (1993). Research on New Caledonian terrestrial fauna: achievements and prospects. *Biodiversity Letters*, *1*(3), 123–129. JSTOR. Retrieved March 7, 2011, from http://www.jstor.org/stable/2999756.

Clark, A. L., Li, J. A., Icay, C., Morgan, W., & Igarashi, Y. (1995). *Economic and developmental potential of manganese nodules within the Cook Islands exclusive economic zone (EEZ)*. Honolulu, Hawaii.

Dasgupta, S., Laplante, B., Meisner, C., Wheeler, D., & Yan, J. (2007). The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis. Washington, DC.

Ellison, J. C. (1994). Palaeo-lake and swamp stratigraphic records of Holocene vegetation and sea-level changes, Mangaia, Cook Islands. *Pacific Science*, *48*(1), 1-15. Retrieved July 14, 2010, from http://scholarspace.manoa.hawaii.edu/handle/10125/2193.

Fitt, W., Brown, B., Warner, M., & Dunne, R. (2001). Coral bleaching: interpretation of thermal tolerance limits and thermal thresholds in tropical corals. *Coral Reefs*, *20*(1), 51-65. doi: 10.1007/s003380100146.

Galbraith, H., Jones, R., Park, R., Clough, J., Herrod-Julius, S., Harrington, B., et al. (2002). Global Climate Change and Sea Level Rise: Potential Losses of Intertidal Habitat for Shorebirds. *Waterbirds*, *25*(2), 173. doi: 10.1675/1524-4695(2002)025[0173:GCCASL]2.0.CO;2.

George, N., Tuatai, T., Turua, T., & Solomona, D. (2007). *Rarotonga Water Quality Annual Report 2006*. Rarotonga, Cook Islands.

George, N., Tuatai, T., Turua, T., & Solomona, D. (2009). *Rarotonga Water Quality Annual Report 2007*. Rarotonga, Cook Islands.

Goreau, T., McClanahan, T., Hayes, R., & Strong, A. (2000). Conservation of Coral Reefs after the 1998 Global Bleaching Event. *Conservation Biology*, *14*(1), 5-15. doi: 10.1046/j.1523-1739.2000.00011.x.

Govan, H., Tawake, A., Tabunakawai, K., Jenkins, A., Lasgorceix, A., Schwarz, A., et al., others. (2009). Status and potential of locally-managed marine areas in the South Pacific: meeting nature conservation and sustainable livelihood targets through wide-spread implementation of LMMAs. *SPREP/WWF/WorldFish-Reefbase/CRISP. 95pp*, *5*(April). Retrieved March 8, 2011, from http://www.sprep.org/att/publication/000646_LMMA_report.pdf.

Government of Fiji. (2010). *Fiji's Fourth National Report to the UNCBD*. Suva, Fiji.

Government of Samoa. (2009). *Convention on Biological Diversity - Samoa's 4th National Report*. Apia, Samoa.

Government of the Cook Islands. (2005). *Millenium Development Goals National Report* (p. 65). Rarotonga, Cook Islands.

Government of the Cook Islands. (2006). *Te Kaveinga Nui: Living the Cook Islands Vision – A 2020 Challenge (National Sustainable Development Plan)* (p. 52). Rarotonga, Cook Islands.

Heptonstall, R. E. A. (2010). *The Distribution and Abundance of Myna Birds (Acridotheres tristis) and Rimatara Lorikeets (Vini kuhlii) on Atiu , Cook Islands*.

Hunt, C. (2003). Economic globalisation impacts on Pacific marine resources. *Marine Policy*, *27*(1), 79–85. Elsevier. Retrieved March 10, 2011, from http://linkinghub.elsevier.com/retrieve/pii/S0308597X02000556.

Jones, Rhys. (2001). The status of seabird colonies on the Cook Islands atoll of Suwarrow. *Bird Conservation International*, *11*, 309-318.

Jones, Rhys. (2008). *Suwarrow Seabird Survey: An assessment of the number and age-stages of seabird chicks on the motus of Suwarrow atoll during July 2008* (p. 19). Rarotonga.

Karika, I. (2004). *A Program to Establish a Suwarrow National Park Authority*. Rarotonga, Cook Islands.

Keith, P., Marquet, G., & Gerbeaux, P. (2010). *Freshwater survey Rarotonga (Cook Islands)*. Unpub. Report.

Lee, T., Burch, J. B., Coote, T., Fontaine, B., Gargominy, O., Pearce-Kelly, P., et al. (2007). Prehistoric inter-archipelago trading of Polynesian tree snails leaves a conservation legacy. *Proceedings of the Royal Society B*, *274*, 8. The Royal Society. doi: 10.1098/rspb.2007.1009.

Lieberman, A., & McCormack, G. (2008, November). An island endemic - reintroduction of the Kuhl's lory. *PsittaScene (November) Magazine of the World Parrot Trust*, *59*(11), 1241-1241. doi: 10.1176/appi.ps.59.11.1241.

Lowrey, T. K., Whitkus, R., & Sykes, W. R. (2005). A new species of Tetramolopium (Asteraceae) from Mitiaro, Cook Islands: biogeography, phylogenetic relationships, and dispersal. *Systematic Botany*, *30*(2), 448-455. Retrieved July 14, 2010, from http://www.bioone.org/doi/full/10.1600/0363644054223693.

Manarangi, A. (2004). *Survey and Reducing the Impact of Invasive Alien Species on Rarotonga, Aitutaki, Mauke, Atiu and Mitiaro*. Rarotonga, Cook Islands.

Manarangi, A., & Wigmore, W. (2002). *Report on the Invasive Weed Balloon Vine (Cardiospermum grandiflorum), on the Island of Rarotonga, Cook Islands* (p. 17). Rarotonga, Cook Islands.

McCormack, G. (1997). The Status of Cook Islands Birds. *World Birdwatch*, *19*(1), 13-16.

McCormack, G. (2002). *Cook Islands biodiversity strategy and action plan* (p. 81). Rarotonga, Cook Islands. Retrieved July 15, 2010, from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Cook+Islands+Biodiversity+Strategy+and+Action+Plan#0.

McCormack, G. (2007). Cook Islands Biodiversity Database, Version 2007.2. *Cook Islands Natural Heritage Trust*. Retrieved from http://cookislands.bishopmuseum.org.

McCormack, G. (2008). *The Rimatara Lorikeet or Kura on Atiu (Cook Islands) First annual report*. Rarotonga, Cook Islands.

McCormack, G. (2009). A New Myna on Rarotonga - 21 February. *Cook Islands News*. Rarotonga, Cook Islands.

McCormack, G., & Kunzle, J. (1994). Le 'Ura ou Lori de Rimatara (Vini Kuhlii): sa Repartition Passee, son Statut Actuel, et les Priorites pour sa Protection. *Seminaire Manu Connaissance et Protection des Oiseaux* (pp. 56 - 68). Tahiti, Polynesia francaise: Societe d'Ornithologie de Polynesie.

Ministry of Marine Resources. (2009a). *Cook Islands Longline Fishery Annual Report*. Rarotonga, Cook Islands.

Ministry of Marine Resources. (2009b). *Cook Islands National Fisheries Report 2009*. *Fisheries (Bethesda)*. Rarotonga, Cook Islands.

Ministry of Marine Resources. (2010). *Cook Islands Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics*. Rarotonga, Cook Islands.

Mitchell, J. (2009). *The distribution and abundance of an invasive species: the common myna (Acridotheres tristis) on Atiu, Cook Islands.* Leeds, UK.

Mitchell, W., Chittleborough, J., Ronai, B., & Lennon, G. W. (2000). Sea Level Rise in Australia and the Pacific. *Climate Change News*, (12), 7-10.

Morat, P. (1993). Our knowledge of the flora of New Caledonia: endemism and diversity in relation to vegetation types and substrates. *Biodiversity Letters*, *1*(3), 72–81. JSTOR. Retrieved March 7, 2011, from http://www.jstor.org/stable/2999750.

Munro, E. M. (2009). Mainstreaming Biodiversity in the Cook Islands. *Regional Capacity Development Workshop for the Pacific Region on National Biodiversity Strategies and Action Plans, Mainstreaming of Biodiversity and Integration of Climate Change*. Nadi, Fiji: CBD.

Nishimura, A. (1974). Deep-Sea Sediments in the Penrhyn Basin, South Pacific (GH83-3 AREA). *Geological Survey of Japan Cruise report*, *23*, 41-60.

Retrieved March 10, 2011, from http://www.gsj.jp/Pub/CRUISE/no.23/23-04.pdf.

N'Yeurt, A. D. R. (2000). *A Preliminary Illustrated Field Guide to the Common Marine Algae of the Cook Islands (Rarotonga and Aitutaki)*. Rarotonga, Cook Islands.

Passfield, K. (2008). *East Polynesia Ecoregion Reconnaissance Report*. Rarotonga, Cook Islands.

Pautot, G., & Melguen, M. (1979). Influence of deep water circulation and sea floor morphology on the abundance and grade of central South Pacific manganese nodules. In J. L. Bischoff & D. Z. Piper (Eds.), *Marine Geology and Oceanography of the Pacific Manganese Nodule Province*. New York, New York: Plenum Publishing Corporation.

Pinca, S., Awira, R., Boblin, P., Kronen, M., Pakoa, K., Friedman, K., et al. (2009). *Cook Islands Country Report: profiles and results from survey work at Aitutaki, Palmerston, Mangaia and Rarotonga PROCFish/C/CoFish Project*. Noumea, New Caledonia.

Pippard, H. (2009). *The Pacific islands: an analysis of the status of species as listed on the 2008 IUCN Red List of Threatened Species*. Suva, Fiji.

Robertson, H. A., & Saul, E. K. (2008). Conservation of kakerori (Pomarea dimidiata) in the Cook Islands in 2006/07. Wellington, New Zealand.

Robinson, R. A., Learmonth, J. A., Hutson, A. A., Macleod, C. D., Sparks, T. H., Leech, D. I., et al. (2005). *Climate change and migratory species*. Norfolk, UK: WIT Press. doi: 10.2495/EHR070221.

Romilly, G. de, Manarangi-Trott, T., Matepi, M., & Tiraa-Passfield, A. (2005). *Draft Report- Review of Legal and Institutional Frameworks: Legal and Institutional Strengthening of Environmental Management in the Cook Islands. (ADB TA 4273-COO)*. Rarotonga, Cook Islands.

Rongo, Teariki. (2006). *Draft Manuae Resource Management Plan*. Rarotonga, Cook Islands.

Rongo, Teariki. (2006). *Taruku te Ra, Nootake te Marama e Vari te Ara Po*. Rarotonga, Cook Islands: National Environment Service.

Rongo, Teariki, & Rongo, Julia. (2004). *The Final Report - "An Overall Report on the Full Implementation and the Analysis of the State of Capacity and Future Needs" to Survey and Conserve Rare Vairakau Plants*. Rarotonga, Cook Islands.

Rongo, Teariki, & Rongo, Julia. (2004). *Report of Survey Findings and Policy for Legislative Framework*. Rarotonga, Cook Islands.

Rongo, Teina, Holbrook, J., & Rongo, T. C. (2006). *Reef Survey for Rarotonga*. Rarotonga, Cook Islands.

Rongo, Teina, Rongo, T. C., & Rongo, Jackalyn. (2009). *Rarotonga Fore Reef Community Survey for 2009*. Rarotonga, Cook Islands.

Rutherford, J., Scarsbrook, M., & Broekhuizen, N. (2000). Grazer control of stream algae: modeling temperature and flood effects. *Journal of Environmental Engineering*, *126*(4), 331–339. Retrieved March 10, 2011, from http://famu.org/mayfly/pubs/pub_r/pubrutherfordj2000p331.pdf.

Saul, E., & Tiraa, Ana. (2004). *A System of Protected Natural Areas in the Cook Islands*. Rarotonga, Cook Islands.

Scally, F. A. de. (2008). Historical Tropical Cyclone Activity and Impacts in the Cook Islands 1. *Pacific Science*, *62*(4), 443–459. BioOne. doi: 10.2984/1534-6188(2008)62.

Solomona, D., George, N., Tuatai, T., & Turua, T. (2009). *Water Quality Data Report - Rarotonga: January - December 2008* (p. 29). Rarotonga, Cook Islands.

Solomona, D., Tuatai, T., Turua, T., & George, N. (2009). *Water Quality Data Report - Manihiki: January - December 2008* (p. 19). Rarotonga, Cook Islands.

Solomona, D., Tuatai, T., Turua, T., & George, N. (2010). *Water Quality Annual Data Report - Penrhyn: January - December 2009* (p. 18). Rarotonga, Cook Islands.

Solomona, D., Turua, T., George, N., & Tuatai, T. (2009). *Water Quality Data Report Aitutaki: January - December 2008* (p. 22). Rarotonga, Cook Islands.

Space, J. C., & Flynn, T. (2002). *Report to the Government of the Cook Islands on invasive plant species of environmental concern* (p. 148). Honolulu, Hawaii. Retrieved July 15, 2010, from http://202.4.49.29/att/IRC/eCOPIES/Countries/Cook_Islands/17.pdf.

Sponseller, R. A., Benfield, E. F., & Valett, H. M. (2008). Relationships between land use, spatial scale and stream macroinvertebrate communities. *Freshwater Biology*. doi: 10.1046/j.1365-2427.2001.00758.x.

Staddon, S. C., Compton, S. G., & Portch, A. (2010). Dispersal of fig seeds in the cook islands: introduced frugivores are no substitute for natives. *Biodiversity and Conservation*, *19*, 1905-1916. doi: 10.1007/s10531-010-9811-3.

Sykes, W. R., & Meyer, J.-yves. (2009). Draft Paper: Vegetation and flora of ’Atiu (Cook Islands). *Unpublished*, 1-5.

Tangianau, T. (2004). *Cook Islands National-Environment Strategic Action Framework 2005-2009: E Kura Mana To Tatou Aorangi* (p. 97). Rarotonga, Cook Islands.

Tiraa, A. (2006). Implementing the CBD—a community perspective from the Cook Islands. *SPREP - Celebrating Pacific Island Biodiversity: A Case Study of Island Life*. Apia, Samoa.

Tiraa, Ana. (2010). *DRAFT REPORT - Ecology, abundance and distribution assessment of the endemic Rarotonga Starling (Aplonis cinerascens)*.

Tuatai, T., Solomona, D., Turua, T., & George, N. (2009). *Manihiki Water Quality Annual Report 2007*. Rarotonga, Cook Islands.

Turia, G. (2004). *Survey of Baseline Information for Assessing the Capacity Building Needs of the Cook Islands for the Safe Management of GMO's*. Rarotonga, Cook Islands.

Turua, T., George, N., Tuatai, T., & Solomona, D. (2009). *Aitutaki Water Quality Annual Report 2007*. Rarotonga, Cook Islands.

Turua, T., Tuatai, T., George, N., & Solomona, D. (2010a). *Aitutaki Water Quality Data Report January - December 2009* (p. 19). Rarotonga, Cook Islands.

Turua, T., Tuatai, T., George, N., & Solomona, D. (2010b). *Rarotonga Water Quality Data Report: January - December 2009* (p. 24). Rarotonga, Cook Islands.

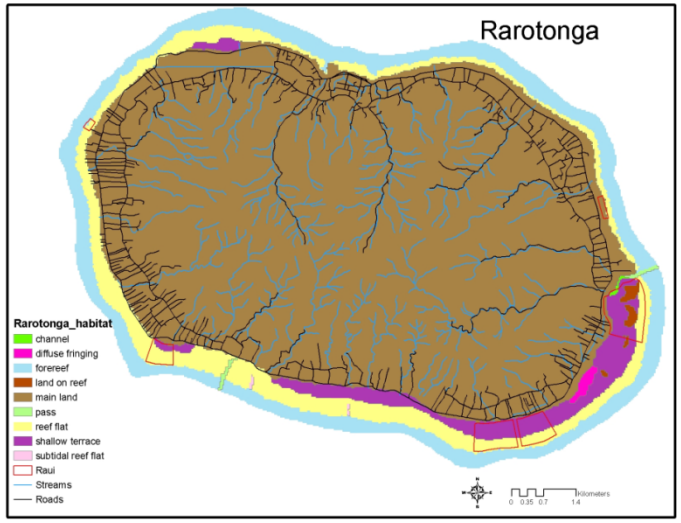
Upoko, T. T. (2005). *National Stocktake Report - National Capacity Self Assessment for Global Environment Project*. (T. Temata, L. Karika, P. Carruthers, & C. Scott, Eds.) (p. 87). Rarotonga, Cook Islands: National Environment Service.

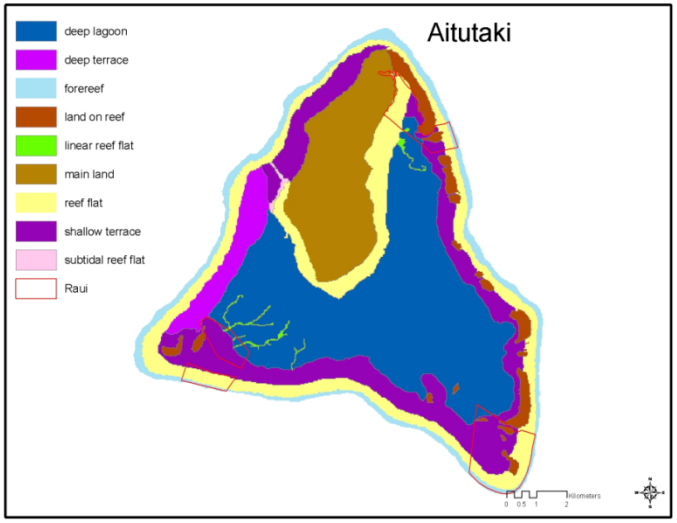
Usui, A., Nishimura, A., & Mita, N. (1993). Composition and growth history of surficial and buried manganese nodules in the Penrhyn Basin, Southwestern Pacific. *Marine Geology*, *114*(1-2), 133-153.

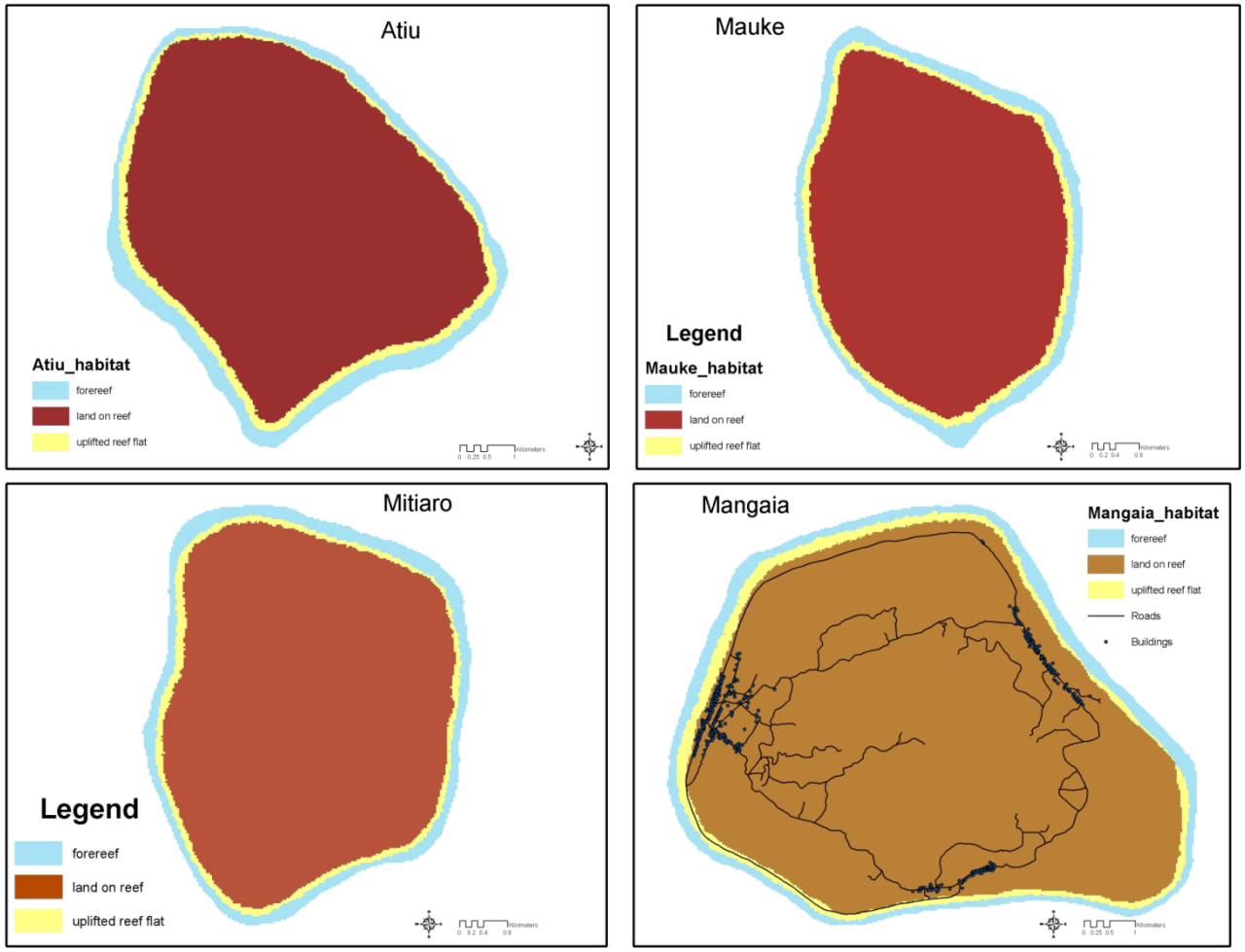
Wagner, W. L., & Lorence, D. H. (2002). Flora of the Marquesas Islands. Retrieved from http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm.

Appendix 1 Habitat maps for the Islands of the Cook Islands.

(Courtesy of Paul Anderson, SPREP. Data obtained from the Millennium Coral Reef Mapping Project, Institute for Marine Remote Sensing, University of South Florida (IMaRS/USF) and Institut de Recherche pour le Développement (IRD/UR 128, Centre de Nouméa). Additional data from WWF East Polynesian eco-regional analysis.






Atiu
Atiu_habitat
forereef
land on reef
uplifted reef flat
Mauke
Legend
Mauke_habitat
forereef
land on reef
uplifted reef flat
Mitiaro
Legend
forereef
land on reef
uplifted reef flat
Mangaia
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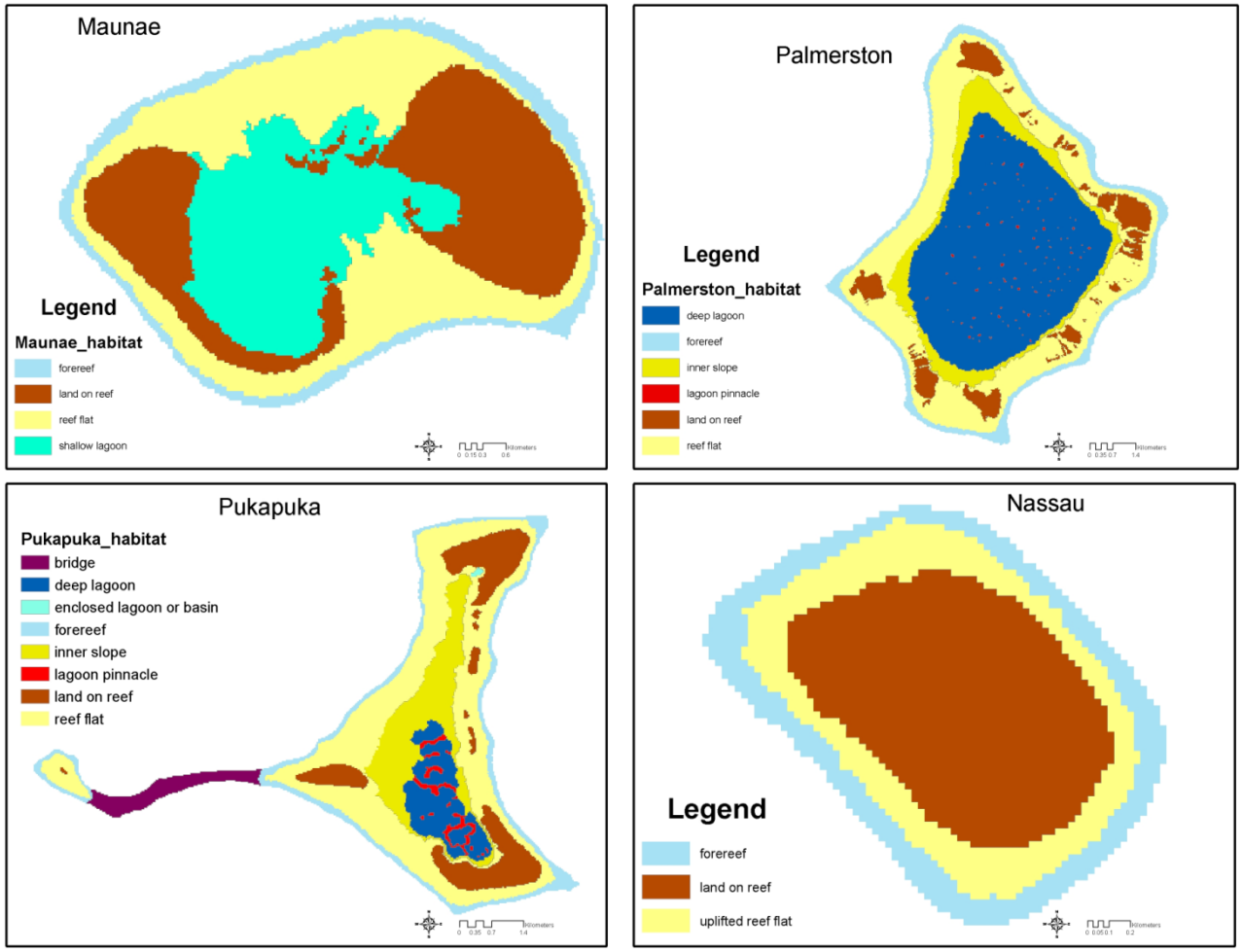
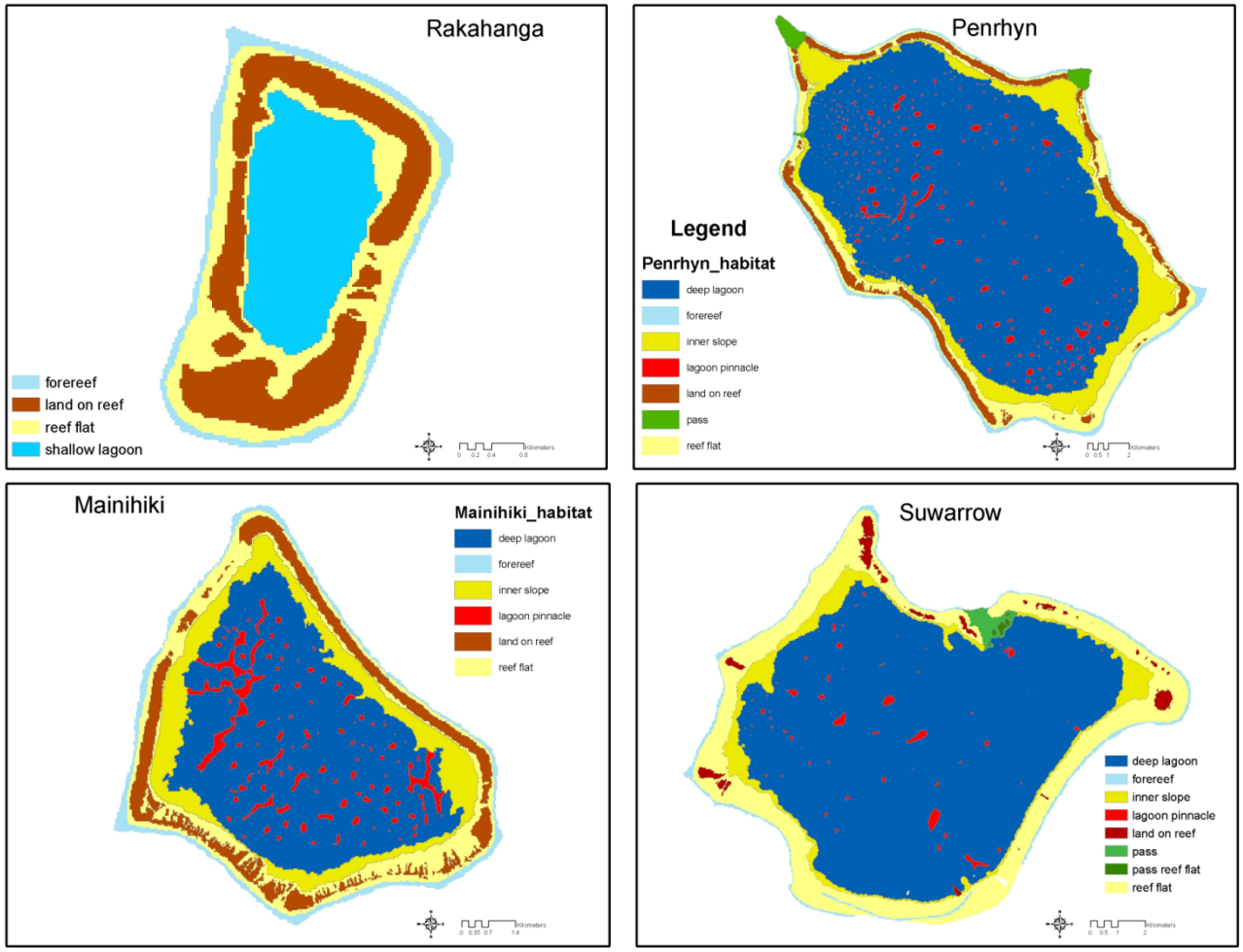
forereef
land on reef
uplifted reef flat
Roads
Buildings


Maunae
Legend
Maunae_habitat
forereef
land on reef
reef flat
shallow lagoon
Palmerston
Legend
Palmerston_habitat
deep lagoon
forereef
inner slope
lagoon pinnacle
land on reef
reef flat
Pukapuka
Pukapuka_habitat
bridge
deep lagoon
enclosed lagoon or basin
forereef
inner slope
lagoon pinnacle
land on reef
reef flat
Nassau
Legend
forereef
land on reef
uplifted reef flat


Rakahanga
forereef
land on reef
reef flat
shallow lagoon
Penrhyn
Legend
Penrhyn_habitat
deep lagoon
forereef
inner slope
lagoon pinnacle
land on reef
pass
reef flat
Mainihiki
Mainihiki_habitat
deep lagoon
forereef
inner slope
lagoon pinnacle
land on reef
reef flat
Suwarrow
deep lagoon
forereef
inner slope
lagoon pinnacle
land on reef
pass
pass reef flat
reef flat

Appendix 2 Threats to Flora

Species at Risk	Threats		Key Changes/Capacity to address threats
	Indirect	Direct	
Rarotonga Haloragis (*Haloragis stokesii*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at the time
Cook Islands Oak Fern (*Microsorum katuii*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at the time
Rarotonga Cyrtandra (*Cyrtandra rarotongensis*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at the time
Rarotonga Sclerotheca (*Sclerotheca viridiflora*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at the time
Rarotonga Balanophora (*Balanophora wilderi*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at the time
Garnotia-Grass (*Garnotia cheesemanii*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at this time
Te Manga Cytandra (*Cyrtandra lillianae*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at this time; • Accessibility is difficult; • Capacity to measure the change is lacking.
Rarotonga Ground-Orchid (*Habenaria amplifolia*)	• Biosecurity risks through invasive species.	• Invasive species	• Unknown at this time
Mitiaro Fan-Palm (*Pritchardia mitiaroana*) – *Iniao*	• Biosecurity risk through invasive species; • Pressure through increasing demand from visitors to the island.	• Access improved to refuge habitat; • Invasive species; • Illegal harvesting and export; • Fire; • Vandalism on palm trunks	• None observed; • Capacity to measure changes is lacking.
Pacific Mahogany (*Calophyllum inophyllum*) – *Tamanu*	• Changing attitude towards preferred trees, e.g. preference for fruit trees; • It's suitability to open spaces reduces its suitability to being planted in and around densely populated areas • There are fewer specialists that posses the skills and knowledge to utilize the species resulting in dependence on imported building materials. • The use of cheaper imported arts and crafts reduces the need to maintain local populations of fibre and timber species; • There is the increase demand for arts and crafts; • Heavy dependence on western medicine reduces the need for tamanu based traditional medicines.	• Re-planting and maintenance programme a low priority; • Removal because of demand for smaller exotic trees and shrubs; • Legal requirements by building code, e.g. trees have to be at least 5 meters from any building; • Natural disaster e.g. hurricanes, storm surge.	• Fewer trees are found; • Larger and older trees on Northern Group islands destroyed during the 2005 cyclones.
Portia Tree (*Thespesia populnea*) – *Miro*	• Changing attitude towards preferred trees, e.g. preference for fruit trees; • There are fewer specialists that posses the skills and knowledge to utilize the species resulting in dependence on imported building materials. • The use of cheaper imported arts and crafts reduces the need to maintain local populations of fibre and timber species;	• Re-planting and maintenance programme a low priority; • Removal because of demand for smaller exotic trees and shrubs; • Legal requirements by building code, e.g. trees have to be at least 5 meters from any building; • Natural disaster e.g. hurricanes, storm surge	• Fewer trees are found; • Larger and older trees on Northern Group islands destroyed during the 2005 cyclones.

Species at Risk	Threats		Key Changes/Capacity to address threats
	Indirect	Direct	
	• There is the increase demand for arts and crafts; • Heavy dependence on western medicine reduces the need for miro based traditional medicines.		
Pacific Rosewood (*Cordia subcordata*) – *Tou*	• Changing attitude towards preferred trees, e.g. preference for fruit trees; • There are fewer specialists that posses the skills and knowledge to utilize the species resulting in dependence on imported building materials. • The use of cheaper imported arts and crafts reduces the need to maintain local populations of fibre and timber species; • There is the increase demand for arts and crafts; • Heavy dependence on western medicine reduces the need for tou based traditional medicines; • Removal in coastal areas to facilitate tourism in terms of coastal access.	• Re-planting and maintenance programme a low priority; • Removal because of demand for smaller exotic trees and shrubs; • Legal requirements by building code, e.g. trees have to be at least 5 meters from any building; • Natural disaster e.g. hurricanes, storm surge; • Tourism and private dwelling development on coastal areas.	• Fewer trees are found; • Larger and older trees on Northern Group islands destroyed during the 2005 cyclones.
Stalked Adder's-tongue Fern (*Ophioglossum reticulatum*) – *Tiapito*	• Dependence on western medicine; • Practitioners of local medicine are not encouraged; • Changing attitude towards traditional medicine; • Land that are habitats of the plant have changed ownership	• Lawn management practices; • Reduced demand on the traditional use; • Use of herbicides	• Increase abundance around vacant lands.
Leucas (*Leucas decemdentata*) – *Pueikao*	• Dependence on western medicine; • Practitioners of local medicine are not encouraged; • Changing attitude towards traditional medicine; • Land that are habitats of the plant have changed ownership	• Use of pesticides; • The reduced demand on traditional use	• Existing and die-hard traditional medicine practitioners are planting the herb; • Some none-practitioners are growing them for practitioners
Garland Berry (*Solanum anthropophagorum*) – *Poroiti*	• Biosecurity risks through Invasive species; • Dependence on western medicine; • Practitioners of local medicine are not encouraged; • Changing attitude towards traditional medicine; • Land that are habitats of the plant have changed ownership	• Invasive species; • Use of pesticides; • The reduced demand on traditional use	• Traditional medicine practitioners are planting with the assistance of the Ministry of Agriculture Nursery workers; • The ornamental use for garlands has increased in the makatea island communities.
Kava (*Piper methysticum*) – *Kava Maori*	• Biosecurity risks through invasive species	• Invasive species; • Non-naturalised nature creates a reliance on human-assisted replanting	• Traditional medicine practitioners are planting with the assistance of the Ministry of Agriculture Nursery workers
Polynesian Sandalwood (*Santalum insulare*) – *Ai*	• Fire; • Biosecurity risks through invasive species	• Fire; • Invasive species	• New Caledonia variety is now growing in Mauke, Mitiaro, Mangaia, Rarotonga and .
Coconut (*Cocos nucifera*) – *Nu*	• Biosecurity risks through invasive species; • Building Code and current disaster management practices demands such trees to be planted as far as possible from any building; and changing attitude towards the specie due to safety risks, i.e. falling nuts.	• Invasive species; • Changing attitudes towards preferred ways of life; and • Safety risks	• Fewer tall trees on around residential areas on Rarotonga; these are being replaced with more dwarf varieties.
Pandanus (*Pandanus tectorius*) – *Ara Taa-tai*	• Biosecurity risks through invasive species. • Clearing of Pandanus forest	• Invasive species; and • Uncontrolled fire during clearing	• Fewer trees have been noticed on the island of Atiu

Appendix 3 Threats to Fauna

Species at Risk	Threats		Key Changes/Capacity to address the threats
	Indirect	Direct	
Atiu Swiftlet (*Aerodramus sawtellli*) – *Kopeka*	•	• Landcrab predation	• Unknown at this time
Rarotonga Flycatcher (*Pomarea dimidiata*) – *Kakerori*	• Increasing demand on land for agriculture, commercial and private housing; • Increase number of tours and visitors; and • Biosecurity risks through invasive species	• Invasive species (rats) and other introduced species, e.g. myna bird; and • Limited financial resources to continue the habitat protection programme	• No longer critically endangered; and "insurance population" established in Atiu in 2001
Te Kou Landsnail (*Tekoulina pricei*)	• Limited distribution	• Unknown	• Unknown at this time
Rarotonga Partula (*Partula assimilis*)	• Limited distribution	• Unknown	• Unknown at this time
Pacific Fruit Bat (*Pteropus tonganus*) – *Moa Kirikiri*	• Licensed users of firearms; • Access to nesting sites due to improved access to the interior; and • Improved access through visitor tracks	• Hunting	• Abundance is unknown; • Other food sources in the interior have replaced the traditional food source of kapok and mountain banana. The new food sources are the rau maniota or ceropia palmate and patitivai or African tulip.
Blue Lorikeet (*Vini peruviana*) – *Kuramoo*	• Changing landownership leading to changing land use practices, e.g. pesticide use and removal of trees important to the habitat of the Lorikeet; and • Extensive use of herbicides by growers and home owners to maintain the weeds on their property	• Habitat change • Extensive use of herbicides	• Have become a tourist attraction; and have attracted a lot of interests among the local people and the visitors
Marine Turtles (*Chelonia mydas, Eretmochelys imbricata, Caretta caretta*)	• A delicacy and therefore in demand by those who knows how to catch it and prepare it for consumption; • In the case of Aitutaki, there may be a threat to the nesting areas; • Poachers from outside of the country, e.g. illegal fishing vessels	• Consumption by local people; and • Incidental catch in pelagic fisheries	• Sightings on the more populated islands are rare; • Reduced number of local people who like eating and know how to prepare it.
Coconut Crabs (*Birgus latro*) – *Kaveu*	• Delicacy to most who have tasted it and is always on the high demand list; and • Improved access to their habitat	• Over-harvesting • New roads through habitats	• Unknown • The numbers of skilled gatherers for coconut crabs are fewer every generation. • Certain infrastructure projects on the islands, e.g. new road through the makatea in Mauke increase access to coconut crabs.
Mud crab (*Scylla serrata*) - *Upaki*	• Habit on Rarotonga and Aitutaki is threatened by expanding development to support tourism and other commercial activities	• Over-harvesting	• The extent of the change has not been measured, but the reduced supply is being noticed.
Parrotfish (*Hipposcarus longiceps, Scarus. altipinnis*, and *Chlorurus microrhinus*)	• Demand from take away and restaurants on Rarotonga and Aitutaki; • Demand from the local population	• Over-harvesting (Palmerston)	• Parrot fish species had larger mean sizes in 1998 compared to 2007 (Pinca et al., 2009). This suggests that parrotfish stocks are still exploited at possibly unsustainable levels.
Giant clams (*Tridacna maxima*) – *Paua*	• Demand in Rarotonga for clams from the northern group	• Visiting groups (*Tere* parties) taking large quantities when they depart	• Aitutaki stocks decreased greatly from 25 years ago • Reduced stocks have resulted in harvesting bans in Manihiki and Tongareva
Cetaceans	• Ocean noise,	• Scientific whaling in the Southern Ocean; • Uncontrolled tourism activities in and around nursing mothers and calves.	• Intensive research by Whale Research Centre on Rarotonga is providing valuable monitoring information.

Appendix 4 Threats to Ecosystems

Ecosystems at Risk	Threats		Key Changes/Capacity to address the threats
	Indirect	Direct	
Wetlands: Rarotonga	• Demand on land for housing and commercial development; • Land development on the sloping lands and in the catchments impact strongly on the wetland through siltation and therefore affecting the flow of water towards the sea. • Poor drainage development in road developments; • Climate change • Abandonment of use resulting in significant vegetation change and ecosystem functioning	• Filling and claiming of wetlands; • Siltation through surface runoff; • Modification of wetlands through Taro planting modifying water flow ; and • Invasive species, taking over the areas covered by water absorbent species. • Dumping of solid waste and refuse	• Decreasing wetland area on Rarotonga through reclaiming. There are no data available to show these changes.
Wetland: Outer Islands	• Land development on the sloping lands and in the catchments impact strongly on the wetland through siltation and therefore affecting the flow of water towards the sea. • Poor drainage development in road developments; • Climate change • Abandonment of use resulting in significant vegetation change and ecosystem functioning • Aitutaki, tourism impact's on O'otu wetland. • Other Islands, particularly the low lying northern group, are threatened by rising sea levels and associated seawater intrusions	• Cyclones; • Extreme high seas • Clearing	• Less people are using wetlands; • The capacity to utilize the wetlands for the benefit of the people is dependent on imported technology, e.g. innovative ways to make soil after a cyclone has flooded the wetlands; • Pumping of sea water away from the area to assist taro plants to recover.
Makatea forests (Atiu, Mauke, Mitiaro and Mangaia)	• Depopulation of these islands meant farmed animals such as pigs and goats have gone wild and feed on makatea forest vegetation. This is threat to medicinal plants, income-generating plants, e.g. *maire* especially the lower vegetations.	• Wandering animals (goats and pigs) • Invasive species, e.g. *Acacia* spp. and Java Plum (*Syzygium cumini*)	• No data is available, but spread of weeds are observed key changes; • Increase acreage covered by *Acacia* spp. and Java Plum
Foreshore (Rarotonga)	• Commercial development of land, especially for tourism; • Changing perception on land value; • Inexperienced contractors	• Construction of structures for the protection of foreshores; • Filling using foreign soil; • Clearing of coastal vegetation • Poor landscaping workmanship	• Increase land used for housing and tourist accommodation; • Changing plant types in the area.
Cloud Forest of Rarotonga	• Changing Climate •	• Increase use of area by visitors; • Biosecurity risks through invasive species	• No data available
Lagoons and coral reefs	• Changing Climate (warming); • Increase in visitor numbers producing excess nutrient levels; • Local capacity to enforce appropriate and proper standards. • Improperly excavated or fill lands on the foreshore and inland.	• Warming, causing coral bleaching; • Pollution from sewage (people and piggeries), agriculture	• Water quality data are available from MMR; • Ciguatera fish poisoning cases are being recorded and interpreted; • Irritant Syndrome. Algal blooms under investigation; • Capacity to monitor indicators and enforce existing standards are weak
Seamounts	• Changing Climate; • International interests in the countries sea bed minerals	• Seabed mining; • Oceanic fishing; • Pollution; • Illegal and unreported fishing; and • Unregulated (IUU) fishing	• Potential threat, issue of exploratory seabed mining licences.
Oceans	• Changing Climate	• Seabed mining;	• The number of fishing

Ecosystems at Risk	Threats		Key Changes/Capacity to address the threats
	Indirect	Direct	
		• Oceanic fishing; • Pollution; • Illegal and unreported fishing; and • Unregulated (IUU) fishing	licenses issued.

Appendix 5 Native Species Assistance Provided under the NBSAP Add-on

1) **Peter Maddison** : An entomologist from New Zealand whom collected and identified insects with a special focus on aphids, mealy bugs, scales and bio-controls. He is also undertaking an initial sorting of the Cook Islands specimens in the Landcare collection and identifying those not presently in the database. Samples of insects and other arthropods and invertebrates were collected from a variety of plants, forest litter and a variety of other habitats. A total over 5000 specimens were collected and it is probable that there may be a number of species not recorded previously in the Cook Islands

2) **Fred Brook**: A Terrestrial malacologist (snail specialist) from New Zealand carried out an identification and survey on native land snails of Rarotonga. These data when received will be included into the Cook Island Biodiversity Database.

3) **John Game**: An expert on ferns carried-out work on improving and standardizing the 33 fern descriptions in the Biodiversity Database. *Asplenium polyodon* a fern not found on Rarotonga was photographed as well as *Phymatosorus katuii* an endemic fern in the outer island. John also checked the status of two rare ferns on Rarotonga *Acrophorus leucorachis* and *Asplenium schizotrichum*. Both species are still present and surviving at sites where it was last observed.

4) **Justin McCormack**: A computer programmer carried out work on re-designing and re-programming the Cook Islands Biodiversity Database.

5) **Kevin Salisbury:** An ethonobiologist visited the island of Pukapuka to check the identification of local plants and animals and to collect associated Pukapuka names. Two new records of species were added to the database. Nine hundred Pukapukan names were recorded and informants verified against actual specimens.

6) **Al Samuelson:** A Pacific beetle specialist who works on the most extensive Pacific beetle collection has identified many if the Cook Islands beetles presently listed in the Biodiversity database. Al collected and mounted 265 specimens representing an estimated 47 species in 17 families and 29 of these species were new records added to the database.

7) **Malcom Francis and Kendall Clements:** Are marine fish specialist photographed and recorded 258 species of marine fish with 7 unrecorded species. One of the unrecorded species is an un-described species which will remain unidentified until such time that a specimen is collected for description.

8) **Peter Johnson:** Fungi specialist undertook extensive fieldwork inland of Rarotonga including Te Kou, Te Manga and Ikurangi and collected 178 specimes representing about 130 species.

9) **Kevin Tilbrook:** Is a Bryozoa specialist who undertook a survey of bryozoans on Rarotonga and Aitutaki and collected approximately 50 bryozoan species. These specimens have been sent to the Natural History Museum, London for identification and curation.

Appendix 6 Cook Islands NCSA Analysis

Excerpt from the Cook Islands National Self Capacity Assessment Report (Upoko, 2005)

I. Introduction to Biodiversity programmes and capacities

Background

1. The overall focus of the United Nations Convention on Biological Diversity (UNCBD or CBD) was the conservation of biological diversity, their sustainable use, and fair and equitable sharing of benefits arising out of the utilization of genetic resources. The diverse landforms, water and ocean environment of the earth provides millions of species of plants and animals the necessary support for their livelihood and survival.
2. The loss of biological diversity resources as a result of negative human development in the past has generated global concern about the impact of this loss on future populations' livelihoods and survival. In this context, the world future economies and development is also seen to depend on the well being of biodiversity for survival.
3. Therefore, to assist in reversing the loss of biodiversity and the future sustainability of the earth's resources, current global commitments with regards to producing results for biodiversity have concentrated on three main areas for implementation. These include:
    - Sustainable Development
    - Ecosystems Management
    - Biodiversity Conservation
4. The Convention on Biological Diversity (CBD) was opened for signing in 1992 at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil and came into force in December 1993. In ratifying the CBD in 1992, the Cook Islands Government committed itself and the Cook Islands people to the implementation of the CBD and meeting its targets.
5. The Cook Islands CBD programme was centred on the National Biodiversity Strategic Action Plan (NBSAP). The NBSAP project was probably the most influential national programme related to CBD when the national biodiversity programme started in 1996. The NBSAP was started in 1999 and completed in 2002.
6. During the drafting of the NESAF 2005-2009, the NBSAP strategies were revisited and integrated into the biodiversity component of the NESAF. The NESAF is the next five years' strategic framework for the environment sector, and although the NBSAP was completed in 2002, it is still considered valid for the next five years as most of its strategies and actions have not yet been implemented.
7. This thematic assessment of the CBD and biodiversity capacities is therefore a continuous attempt to improve the implementation of the NESAF and NBSAP by identifying capacity constraints and gaps likely to impede progress in implementing national programmes related to CBD. This will help the Cook Islands meet its commitments and obligations under the CBD.
8. Additionally, this assessment will identify priorities and needs for capacity building in the Cook Islands and link country action to the broader national environmental management and sustainable development frameworks.

a. UNCBD Requirements

The primary obligations of the UNCBD as they relate to the Cook Islands interests and central to this thematic assessment were highlighted as follows:

- The Convention calls for the Cook Islands to facilitate effective national biodiversity planning and integration efforts. The general provisions commit the Cook Islands to develop and implement community and national programmes related to biodiversity protection, conservation and management of identified species and ecosystems. In terms of mainstreaming of biodiversity, the Cook Islands are expected to put in action the integration

of biodiversity management into national and sectoral legislation, policies, plans and programmes.

- Provisions also require the introduction of appropriate arrangements to ensure that environmental consequences of relevant programmes and policies are the subject of environmental impact assessment and that significant adverse impacts on biological diversity are minimized.
- With regards to access to financial resources and mechanisms for biodiversity, the Cook Islands, in accordance to its capabilities, is called upon to provide funding and or access financial resources provided via the financial mechanism of the Convention and/or via other donors.
- The Convention also requires for institutional capacity building for the effective implementation of biodiversity programmes by strengthening or establishment, as appropriate, of national biological diversity secretariats or national focal points.
- Provisions also require the Cook Islands to provide measures for the identification and monitoring of components of biological diversity important for its conservation and sustainable use.
- Additionally, the Convention encourages the Cook Islands to respect and preserve knowledge, innovations and practices of indigenous and local communities.
- The Cook Islands is required to develop and introduce economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity.
- The Convention also commits the Cook Islands to adopt measures that will enhance the recovery and rehabilitation of endangered species as well as promote policies and regulations to reduce spread of invasive and harmful species. Provisions also outlined the importance of management of national biodiversity resources including protection, conservation and providing for their sustainable use. Similarly to *in-situ* conservation measures, the Cook Islands should also consider the collection of biological resources from natural habitats for *ex-situ* conservation purposes.
- In terms of biodiversity awareness and education, the Cook Islands is required to: promote and encourage understanding of the importance of, and the measures required for, the conservation of biological diversity; establish and maintain programmes for scientific and technical education and training; establish and operate clearing-house mechanism to promote and facilitate technical and scientific co-operation.
- The Convention also calls for equitable sharing of benefits and access to biodiversity by developing and introducing measures regulating the access to genetic resources and to provide access for and transfer to other Parties of technologies that are relevant to the conservation and sustainable use of biological diversity. Provisions also outlined the need for the Cook Islands to take legislative, administrative or policy measures, as appropriate, with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilisation of genetic resources. These measures include the development, adoption and implementation of the National Research Foundation Act, Intellectual Property Rights Act, and Copy Rights Act.
- The Cook Islands is also encouraged to address provisions of the Cartagena Protocol on Biosafety, especially, develop and introduce appropriate measures, such as Biosecurity Act as well as develop strategies to strengthen biosecurity and biosafety programmes, to ensure safety regulations in handling living modified organisms resulting from biotechnology.

II. Overview of Biodiversity and UNCBD Implementation in the Cook Islands

Stakeholder consultation combined with SWOT and Gap Analysis highlighted several areas with capacity gaps. Drawing on these results of the consultations, the NCSA Stocktake report, and other national reports produced during the time of the NCSA project, Root Cause Analysis was used to further define problem areas and determine detailed capacity gaps.

Many areas identified under Biodiversity were found to be key cross-cutting environmental issues, and as such, will be analysed in the Cross Cutting Report. These include water resource management, integrated coastal zone management, waste, pollution and sanitation, and resource management. The remaining issues have been refined into six key thematic areas for further in-depth analysis, including the broad grouping of issues under Biodiversity Conservation.

The key biodiversity thematic areas identified are:

7. Biodiversity Conservation
    e. Species Management
    f. Invasive Species
    g. Ecosystems Management
    h. *Ex-situ* conservation
8. Biosafety and Biosecurity
9. Equitable Sharing of Benefits and Access to Biodiversity
10. Mainstreaming Biodiversity
11. Management of Knowledge related to Biodiversity
12. Education Awareness and Training

Gaps identified during this process as cross-cutting capacity issues that also affect Climate Change and Land Degradation, have been transferred to the Cross Cutting Report. This includes capacity gaps in education and awareness, mainstreaming of environmental management, and information management and exchange.

Thematic Area: Biodiversity Conservation

The shift in Government focus over the last 10 years from conservation to management of development has left a gaping hole in environment programmes. Biodiversity species management, monitoring, and recovery programmes, particularly for endangered, threatened or endemic species in the Cook Islands, is lacking and any activities concerning biodiversity management, conservation and protection are reactive and ad-hoc.

Species Management

- **Summary of Capacity Gap**

A comprehensive assessment of the status of wildlife in the Cook Islands, including an inventory of threatened, vulnerable or endangered species is generally not available. The cessation of many monitoring and data collection programmes for species of significance, both terrestrial and marine, has meant that there is limited knowledge of biodiversity, habitats and ecosystems available. Much of the up-to-date collection of scientific data, data which could give early indications of species decline and potential loss of biodiversity, is limited to those species that are considered of 'economic value'. The Cook Islands Biodiversity database under the Natural Heritage Trust is the only comprehensive biodiversity database however it is limited in scope to an inventory of species present in the Cook Islands and a bibliography of biodiversity literature.

Cook Islands capacity to develop and implement biodiversity conservation strategies and plans is limited by data, insufficient human resources and the lack of high level support programmes. There is limited expertise and availability of expertise to develop and implement programmes related to threatened and endangered species including promoting protection and recovery of these species.

Root Causes

- Information of Cook Island species, habitats and ecosystems, especially for those that may be threatened or endangered, is scattered, limited and does not provide a sufficient baseline
- No management criteria to determine threatened, vulnerable or endangered species, and the establishment of appropriate management regimes (e.g. captive breeding, protection of breeding areas and habitat, etc.) which are based on sound and proven scientific management principles
- Limited integration of past research/studies into biodiversity conservation activities
- Limited monitoring and case studies on local species, ecosystems and habitats
- Lack of general public involvement in systematic observation
- Limited studies by academic institutions on Cook Islands biodiversity
- Very few local experts able and available to undertake biodiversity conservation work
- Opportunities to work in species conservation and management in the Cook Islands is severely limited
- Non-governmental and community-based organisations have little capacity to carry out in conservation management activities
- Insufficient joint partnership programmes between Government, NGOs and CBOs, particularly relating to on-the-ground conservation activities which are also not within the limited resource capacities of some government agencies
- Limited capacity to develop bylaws for conservation management as a mechanism for enforcement of traditional management systems

ACTIONS:

- Develop local capacity to carryout baseline studies of biodiversity in the Cook Islands and undertake comprehensive assessment of the status of our species, habitats and ecosystems
- Develop and implement National Biodiversity Programmes to conserve all endemic flora and fauna, including rare plants used in Maori medicine, rarer varieties of Agro-biodiversity species
- Develop a programme to survey and conserve marine animals harvested for food or financial gain.
- Legislate the requirement for comprehensive assessment of the status of biodiversity in the Cook Islands [including population, distribution, coverage of flora, fauna, and ecosystems] to gather baseline information, and the periodic updating or collection of further inventories in cooperation with the Natural Heritage Trust and island Environment Authorities and councils.
- Appropriate legal and institutional measures need to be established to promote and encourage private and community-based conservancy activities such as the Ra'ui
- Utilise baseline information to develop criteria for determining status of species in the Cook Islands and develop appropriate regimes for management
- Develop and regularly update an inventory of baseline information as the basis for the sound and sustainable management of all wildlife in the Cook Islands
- Utilise the legal capacity of relevant agencies and regional/international assistance to develop appropriate biodiversity or environment management legislation through participatory approaches
- Develop and strengthen the conservation management capacity of relevant organisations to enable them to effectively carry out the mandate provided under the Environment Act 2003, the National Biodiversity Strategy and Action Plan (NBSAP) and the National Environment Strategic Action Framework (NESAF).

- Develop a National Biodiversity Programme and memorandum of understanding between Government, NGOs and CBOs to better utilise available skills and resources to manage biological resources under a prioritised programmatic approach as identified through the NESAF and NBSAP
- Strengthen the capacity of NGOs and CBOs to undertake biodiversity conservation work
- Encourage research into Cook Island biodiversity through the identification and promotion of our national biodiversity research priorities, especially for species management

Invasive Species Management

- **Summary of Capacity Gap**

A key component to managing biodiversity is to manage the threats to that biodiversity, such as invasive species. Invasives have the potential to impact many sectors of society including agriculture, marine and human health, and as custodians of our endemic and native biological resources it is of utmost importance that we take action now to reduce the threats imposed by invasive species.

While border control procedures to minimise the introduction of new invasive species are in place, the necessary resources and personnel to be fully effective at the international and national levels are lacking. Border control covers the movement of passengers and cargo via air and sea transports and in addition to this they must manage wastes and ballasts from these transports. Several initiatives have been implemented to educate and make the public aware of the risks involved in smuggling in plants from overseas undeclared however the problem continues highlighting the need to expand or alter the current education and awareness program. The sphere of invasive species management is vast and severely under resourced (especially human and financial) and as a result some invasive species populations have grown to levels where eradication or even management is either impossible or well beyond our means therefore a concentrated effort will be needed at the national, regional and international arenas to manage where we can.

Root Causes

- Insufficient capacity for effective implementation of Quarantine legislation and activities such as monitoring and management of ports for early detection and action against invasive and potentially species,
- Current Border control staff are limited and some are unskilled or have no scientific background
- Limited capacity to identify and carry out thorough risk assessments on potentially invasive species
- Limited capacity to respond to the threats posed by invasive species, particularly to identify, control, eradicate and monitor invasive species to minimize their impacts on biodiversity resources
- Lack of policies and legislation prohibiting and preventing the movement of invasive species between islands of the Cook Islands
- Ports lack capacity to control or prevent movements of biomaterial between islands and internationally
- Limited coordination of efforts to eradicate invasive species
- Assessment of feasibility of eradication and control options for invasive species in the Cook Islands is limited as well as identified successful methods
- Communications between relevant stakeholders related to invasive species is limited
- Limited awareness of how invasive species are introduced and spread within the Cook Islands
- Lack of awareness of the potential consequences of clearing vegetation in terms of the spread of invasive species further inland where the majority of our endemic and native species reside

- Border Control and Ministry of Health has yet to initiate plans to minimise to risk of health impacts from events such as Avian Influenza or SARS - no plan of action has been prepared.

ACTIONS:

- Strengthen quarantine and border control legislation if necessary for the effective monitoring, enforcement and management of invasive species, including procedures for risk assessments
- Develop the capacity of focal points to carry out thorough risk assessment including drawing on regional expertise for in country training and resources
- Develop a system for undertaking risk assessment including terms of reference and criteria
- Strengthen links to the Pacific Invasive Learning Network (PILN) and Regional Invasive Species Programme
- Undertake a multi-sectoral review, in partnership with the private stakeholders, of the control of transboundary and inter-island movement of terrestrial and marine flora and fauna with a view to developing legislation and strengthening the capacity of ports and focal points to implement.
- Develop a programme involving all islands to survey invasive species in natural ecosystems and the agro-ecosystem, and to display this information on a GIS platform
- Develop the GIS capabilities of relevant stakeholders to produce spatial information for modelling and analysis of biodiversity and invasive species data
- Determine the feasibility of and priorities for eradication and control of invasive species
- Conduct trials/pilot projects to determine effective locally appropriate measures to eradicate or control invasive species
- Develop a strategic implementation plan between all relevant stakeholders to coordinate efforts to manage invasive species
- Develop a national programme for invasive species based on pilot projects and feasibility studies for the eradication and control of invasive species in both natural and human-modified ecosystems
- Develop community-based programme to eradicate those invasive weeds and animal pests that are not yet widespread on particular islands
- Strengthen the capacity of focal points, NGO's and communities to implement and monitor programmes including through ongoing training, resources and data management
- More stringent internal quarantine control measures need to be developed and implemented to protect the outer islands, particularly from invasive species that have not yet spread to these islands
- Develop media and communications strategies for greater exposure and awareness of invasive species issues to local communities and the risks of all invasive species be it plants, insects, diseases, viruses etc to the outer islands
- Provide better training programmes for all stakeholders to reduce spreading of invasive species e.g. cleaning of farm equipment

Ecosystems Management

- **Summary of Capacity Gap**

Human activities are having a major impact on ecosystems in the Cook Islands including changes in ecosystem structures and increasing degradation of resources. Encroachment and habitat loss is occurring on a regular and progressive basis in identified sensitive areas and highlights the insufficient measures in place to protect important terrestrial, reef and lagoon ecosystems.

Past approaches to the development and management of ecosystems or protected areas have been fragmented and reactive. Mechanisms such as Ra'ui of lagoon or inshore resources have been applied to a few areas however management, monitoring and enforcement of these areas have been

weak. Questions have also been raised as to the effectiveness of such mechanisms given the limited overall goals of these protected areas.

Although the establishment of a national system of protected areas has previously been recommended for consideration, a major gap continues to be that important or threatened ecosystems, sensitive areas, and biodiversity resources have not been clearly identified for conservation and that resources and technical capacity for ecosystems management are limited. The absence of legislation to support and govern the management of ecosystems, protected areas and biodiversity resources is a concern. Regulations under the Environment Act 2003 for Suwarrow National Park and Biodiversity Conservation are in the draft stage however more comprehensive legislation may be required.

Root Causes

- Insufficient legislation for the conservation and protection of important ecosystems, protected areas, parks and habitats, including mandates for management plans before biologically unique areas are compromised
- Capacity and resources to classify, map, and prioritise ecosystems and sensitive areas for conservation is very limited, including technical capacity in the identification of ecosystems and all their component processes such as trophic levels/food web, species interactions and habitats
- Lack of on-going local and national ecosystem identification, monitoring and management programmes under NES or any agencies mandate
- Lack of spatial information on ecosystems and capacity to create and analyse that spatial information e.g. GIS and biostatistics
- Inadequate safeguards to ensure that research and TA reports which would contribute to the identification of important or threatened ecosystems and sensitive areas and biodiversity resources are submitted to government and national library or database
- Legal structure for the designation, declaration, conservation and management of national parks and protected areas has not been articulated
- Limited capability to develop regulations related to protected natural areas (PNA) or adjacent areas
- Criteria for the designation of sites of ecological significance is not established
- No programme to establish a national system of protected areas, including community-based, to protect important terrestrial and marine ecosystems.
- Limited local and technical expertise to establish PNA and monitor their effectiveness, including capacity to identify priorities, criteria, processes and procedures for selecting, designating, establishing and developing protected areas
- Data and information related to ecosystems and protected areas is scattered amongst stakeholders
- Limited development and implementation of management guidelines for all types of protected areas, important ecosystems, and sensitive areas based on sound and proven scientific management principles
- Lack of appropriate techniques and guidelines for reviewing and monitoring protected areas
- Insufficient resources, including technical expertise and funding, for ongoing implementation of protected areas
- Limited capacity to engage stakeholders to develop and implement participatory conservation and management plans, including NGO and community based protected areas for important ecosystems and habitats
- Limited awareness or outreach activities to inform communities and other stakeholders on the benefits and importance of protected areas.
- Lack of an independent National Parks and Protected Areas Authority to administer the Cook Islands' national parks and protected areas on behalf of all the major stakeholders
- Lack of management group with the responsibility to conserve Suwarrow wildlife.

- Limited capacity to support the management of Ra'ui areas
- Lack of assessment of effectiveness of Ra'ui areas

ACTIONS:

- Biodiversity Conservation Regulations need consultation and further consideration to be made for specific species, habitats and ecosystems that are under threat
- Address through engaging relevant personnel for implementation programmes on biodiversity and ecosystems management
- Incorporate important or threatened ecosystems, sensitive areas, and biodiversity resources in a holistic approach to conservation through a national biodiversity programme with clearly prioritised and identified areas and objectives.
- Develop technical expertise in the identification of ecosystems and all their component processes, including through training, short courses and practical application.
- Develop technical capacity to create and analyse spatial information through data collection, analysis and GIS applications.
- Develop and implement management guidelines for all types of protected areas, important ecosystems, and sensitive areas based on sound and proven scientific management principles, including ongoing monitoring and review.
- Develop management plans for identified ecosystems based on established criteria, and ongoing monitoring programmes
- Identify mechanisms to ensure research and technical assistance reports for ecosystems related work are readily available, such as incorporation into and enforcement of Research Approval Committee policy or MOUs
- Develop and utilise a legal requirement to undertake inventories, centralise information in a database, and update the information in a systematic way under a National Biodiversity Programme
- Build the capacity and strengthen the roles of NGOs and local communities to promote and implement ecosystem management activities, including through awareness raising, provision of resources and training
- Promote mechanisms such as the Environment Act 2003 to protect strategically important areas or ecosystems and amongst these are watersheds, areas designated as national parks and reserves and, areas prone-to erosion, drought and flood events
- Conduct awareness activities, including participatory workshops on conservation regulations, for all relevant stakeholders within or adjacent to key ecosystems and habitats to develop long term local support and commitment to compliance
- Conserve important ecosystems through a system of protected areas with regulated and monitored activities
- Review, consider and consult on appropriate legislations for land use and zoning
- Draw on local and regional expertise to establish criteria based on sound and proven scientific principles for selecting, designating, establishing and developing protected areas for sites of ecological significance.
- Work with communities and NGO's to clearly define appropriate mechanisms for the management, access, use and ownership of protected areas, including Suwarrow
- Promulgate the Suwarrow National Park Regulations and establish an independent National Parks and Protected Areas Authority to administer the Cook Islands' national parks and protected areas on behalf of all the major stakeholders
- Develop a programme to select areas to establish a national system of community-based protected areas to protect important marine and terrestrial ecosystems.
- Use international legal designations (such as Ramsar and World Heritage) to leverage technical and financial support for island protected areas
- Develop and implement community management plans for a national system of protected areas to protect important terrestrial and marine ecosystems with regulated and monitored activities.

- Raise awareness of funding opportunities for community based activities e.g. SGP, to facilitate access to these resources
- Consider the development of a legal framework for establishing and enforcing Ra'ui and protected areas to support the management of protected areas
- Develop capacity for monitoring, control, and surveillance to implement the legal framework for Ra'ui, including through training
- Improve scientific understanding on the effectiveness of Ra'ui areas and impacts on effectiveness to improve management of Ra'ui protected areas
- Consider financial incentives and mechanisms to fund monitoring and enforcement education and awareness for the Ra'ui such as licensing, user pays fees, fines.

***Ex situ* Conservation**

- **Summary of Capacity Gap**

Ex-situ activities for conservation of important crop species is well developed under the Ministry of Agriculture utilising regional facilities and expertise, however it is the *ex-situ* conservation of other native, endemic and medicinal species that is lacking. Policies and management plans to conserve these species *ex-situ* are lacking and there is limited knowledge and understanding of the importance of, and potential for *ex-situ* conservation. In–country ex-situ conservation is currently not feasible, given the lack of appropriate facilities and scientific capacity to establish, protect and maintain gene banks/genetic resources centres and the costs associated with set up and operation. Aquaculture facilities have recently been established as a pilot project on Rarotonga for some fish species however the long term outcomes of this project will need to be monitored for the success of such operations in the Cook Islands.

Root Causes

- Policies for Plant Genetic Resources need to be developed or improved upon
- Lack of facilities to regulate and maintain biodiversity *ex-situ* due to high costs associated with establishing ex-situ facilities
- Lack of baseline information for species with *ex-situ* conservation importance and potential
- Limited opportunities and research capabilities and laboratories/research facilities.
- Limited local expertise to undertake *ex-situ* conservation work for native, endemic and other locally significant species
- Weak processes of registering and sharing results of both local and international research
- Potential ethical and cultural implications of *ex-situ* conservation, particularly those utilising regional facilities e.g. for vai rakau Maori
- Lack of understanding of good *ex-situ* practises and how the community and NGOs can get involved e.g. botanical gardens

ACTIONS:

- Utilize other regional agencies to preserve important native, endangered and medicinal species *ex-situ* and develop MOU for *ex-situ* conservation including ownership of Cook Islands species that prohibits distribution without prior informed consent from the Cook Islands
- Utilise baseline information from national biodiversity programmes to investigate species of importance for *ex-situ* conservation including feasibility studies
- Strengthen the capacity of focal points to develop a registration system for all research in the Cook Islands and enforce provisions for documentation and information sharing
- Undertake risk assessments and extensive consultations with scientific and local communities to raise awareness of *ex-situ* conservation issues prior to using this methodology

- Develop and raise awareness of guidelines for locally appropriate *ex-situ* practises that the community and NGOs can get involved in e.g. botanical gardens

Thematic Area: Biosafety and Biosecurity

Biosafety and biosecurity in the Cook Islands is limited by resources, technical capacity and inadequate monitoring and enforcement measures. An enabling environment for effective biosafety and biosecurity is lacking. There are no specific policies, procedures or legislation in place to accommodate biosafety, including the trans-movement and safe handling of LMO's and GMO's. Such organisms are not currently covered under the Cook Islands quarantine legislation however a Biosafety Policy Framework has been drafted but needs further development before it can be finalised. A Draft Biosecurity Bill is also awaiting formal completion however further capacity development will be necessary to ensure effective implementation of both. Basic monitoring procedures are in place for biosafety at Customs and Quarantine but enforcement procedures are relaxed and require review. The capacity for the safe management of LMO's and GMO's is very limited. Current facilities for the storage of hazardous goods are inadequate, posing both a security and human health risk. A more coordinated approach is required to ensure that Ministries and Agencies have access to information and resources that will allow them to develop their own biosafety and biosecurity procedures as required.

Root Causes

- Lack of strategic direction at the policy level for biosafety and biosecurity
- Biosecurity legislation is still in draft form and has not yet been promulgated
- Current capacity within Quarantine Division for biosafety and biosecurity, including implementation of the Biosecurity Bill and biosafety activities is insufficient due to limited staff members, some with no background in biosecurity or science at all.
- Limited numbers of researchers, scientists, monitoring and compliance expertise with skills related to biosafety available locally although there are several specialist in areas such as aquaculture, forestry , economics, soil and policy
- No scientific research or development program being undertaken in the Cook Islands directly related to biosafety
- Lack of facilities e.g. laboratories, for the safe handling of LMO's, GMO's and hazardous goods
- Lack of technical capacity and the specialized equipment to undertake any biosafety programmes
- Reliance on regional expertise and facilities to carry out any biosafety work
- Insufficient awareness and information on biosafety and biosecurity issues
- Little coordination between Government and the private sector over the importation of potential LMO's or GMO related matter
- Lack of legal and institutional framework to implement the requirements of the Cartagena Protocol on Biosafety to which the Cook Islands is a signatory.

ACTIONS:

- Complete formalisation of both the Biosecurity Act and Biosafety Policy Framework to guide future programmes
- Develop comprehensive biosafety legislation to control and regulate the importation, experimentation or use of genetically modified organisms (GMOs).
- Ensure that issues relating to biosafety and biosecurity are included in the National Strategic Plan by Government
- Impose rigorous biosafety and biosecurity restrictions to protect human life, health, and the integrity of natural flora and fauna and ecosystems

- Develop policies and procedures to facilitate monitoring and compliance as well as trans-movements, storage and safety handling of LMOs and GMOs.
- Develop the capacity of focal points to carry out thorough risk assessment for biosafety and biosecurity, including by drawing on regional expertise for in country training and resources.
- Develop an risk management regime and establish a permitting process for the importation and use, or the conducting of experiments with LMOs and GMOs,
- Ensure that the handling of dangerous goods and materials were within the required minimum biosafety standards
- Build up of basic scientific and technical expertise in biosafety and biosecurity within identified key stakeholders including the provision of country training and resource allocations to address border control, monitoring and compliance, safety trans-movements storage and handling of LMOs and GMOs and biosecurity quarantine.
- Initiate a public awareness education campaign designed for both the private and public sectors informing them of the importance of biosafety and biosecurity issues and its impacts on the future of Cook Islands society
- Improve coordination of information, resources and knowledge of biosafety and biosecurity issues across related sectors that will impact on research, economic, security and handling procedures
- Encourage Ministries to include biosafety issues and resources to their annual budget processes
- Undertake a multi-sectoral review of the control of transboundary and inter-island movement of terrestrial and marine flora and fauna and of Living Modified organisms (LMOs) and Genetically Modified Organisms (GMOs) with a view to establishing an independent Biosafety or Biosecurity Agency.
- Develop a database of LMOs released for commercial purposes to compare with the things imported into the Cook Islands. These should include things like micro-organisms, food additives, food, animals and crop that have been genetically modified.
- Develop communication strategy for raising public awareness and sharing of information between stakeholders
- Develop a HRD programme for staff development within relevant Ministries to ensure sufficient technical capacity for the implementation of biosafety and biosecurity activities

Thematic Area: Equitable Sharing of Benefits and Access to Biodiversity

The concept of Access and Benefit Sharing (ABS) is relatively new to the Cook Islands however it is an issue of some importance given the close and traditional dependence of our people on local biological resources. Also, past research activities that accessed biological resources were approved with little consideration given to ensuring the benefits arising out of that access were shared equitably.

A major capacity gap is the lack of understanding and awareness of decision makers, such as the National Research Committee, of Access and Benefit Sharing (ABS) issues and why it is important for the Cook Islands to establish an effective enabling environment to manage ABS activities. Currently, there are no suitable arrangements for the effective management of ABS in the Cook Islands including lack of legislation, policies, institutional structures and management systems such as a system of prior informed consent. Little is known about research activities that access biological resources after they have received their research approval and there is limited capacity to monitor these activities in country. There is no means of enforcement of the requirements of the approval permit, especially once the researchers have left the country. Overall there is a general lack of capacity for the implementation of Access and Benefit Sharing in the Cook Islands.

Root Causes

- No agency is mandated to coordinate and manage Access and Benefit Sharing in the Cook Islands
- No policies or legislation specifically related to ABS
- No permitting authority for ABS activities except for research activities that access biological resources
- Limited capacity to carry out thorough risk assessments
- Lack of requirement to undertake risk assessment procedures for research and access activities
- Limited ability to determine risks of unfamiliar research methods, especially with newly developed methodologies
- Lack of capacity for negotiation and mediation required for ABS agreements
- Limited technical personnel able to act as supervisors and inspectors of ABS activities
- Lack of education awareness programme for ABS
- Lack of database to manage information related to ABS research or activities
- Lack of clearing house mechanism for ABS and biodiversity information

ACTIONS:

- Mandate through legislation the Biodiversity Conservation Unit (BCU) within the National Environment Service to coordinate and manage Access and Benefit Sharing activities
- Giving consideration to the National Research Policy, develop legislation to manage all activities related to Access and Benefit Sharing of Cook Islands biological resources (including traditional knowledge, practises and innovations) and to ensure the equitable sharing of benefits that arise from this access
- Legislate the requirement for risk assessment procedures to be carried out before proposed activities, research or methodologies with the potential to significantly impact our environment can be considered
- Expand the mandate of the National Research Committee to serve as the permitting authority for ABS activities in the Cook Islands
- Build effective capacity in-country to coordinate and manage ABS activities, including through specific trainings on ABS issues, communication, mediation, negotiations, legal contracts, education awareness and media.
- Develop mechanisms to foster working partnerships between the National Research Manager and the BCD for the coordination of applications and negotiations for ABS research.
- Strengthen the capacity of the National Research Committee to develop an effective and aware permitting authority, through trainings and education awareness of ABS issues and how they relate to the Cook Islands
- Develop a system for undertaking risk assessment including terms of reference and criteria for approval
- Develop the capacity of focal points to facilitate risk assessment procedures including drawing on NES Operations Division for support and advice
- Develop a mechanism for accessing scientific knowledge including links to regional organisations and academic institutions
- Strengthen the role of communities and resource owners to enable them to fully participate in the negotiations process of ABS agreements for equitable sharing of benefits, including through training in negotiations, mediation, interpretation and drafting of legal contracts
- Identify and train appropriate nationals as fully qualified negotiators and mediators
- Establish a 'Roster of Local Experts' and develop a mechanism to enable them to act as supervisors for ABS research and access activities
- Build the capacity of ABS supervisors and inspectors through trainings and practical learning for monitoring and policing

- Develop a communications strategy and education awareness programme, especially targeting decision makers and resource providers with the aim to fostering a public fully informed on ABS issues
- Develop locally appropriate informational materials in English and Maori including simplified guidelines to the application process and handbooks for public education purposes
- Develop a National Registry of Applications and Contracts database for ABS and link with the planned national registry of research and Cook Islands Research website

Thematic Area: Mainstreaming of Biodiversity

At the national level, policy frameworks to support implementation of biodiversity activities, including the National Biodiversity Strategy and Action Plan (NBSAP), are weak. To date, local implementation of the NBSAP has been slow and mainly been limited to externally funded enabling activities under the Convention on Biological Diversity (UNCBD). Biodiversity issues are not treated as priority for government and are easily subjugated by other environmental management interests such as waste and pollution.

The lack of integration of biodiversity priorities into national economic and development planning and budgetary processes means that there is a constant struggle for recognition and support, and limited consideration of biodiversity issues in national decision-making. In particular, the lack of a National Biodiversity Programme for coordinated implementation of the NBSAP and other biodiversity initiatives is a significant gap and means that current activities are prepared on an ad-hoc basis and dependant on annual budgetary support, external funding or individual scientific interests. Institutional structures, facilities and local technical capacity to undertake biodiversity activities are also inadequately developed. Systematic communication amongst key stakeholders in some sectors for cooperation and coordination between agencies and to minimize overlap of responsibilities remains poor.

Root Causes

- Lack of high level decision to formalise the National Biodiversity Programme and consolidate all national biodiversity related programmes
- Current legislation does not adequately cover biodiversity considerations especially for emerging biodiversity issues such as biosafety and ABS
- Insufficient funding and commitment from Government to implement the NBSAP and other biodiversity strategies
- Dependency on GEF project funding and other project based programmes to drive biodiversity programmes in-country
- Limited capacity for policy development and policy analysis to support the strengthening of policy frameworks for biodiversity
- Allocation of human and financial resources to biodiversity issues and the coordination of activities between agencies is inadequate
- Limited capacity to integrate biodiversity considerations into economic development activities related to the utilisation of biodiversity
- No agency with clear mandate to drive the implementation of the NBSAP and other biodiversity initiatives
- No clear definition of roles and responsibilities of agencies involved in biodiversity related fields to minimize overlap and duplication of efforts, and aid coordination

- Contradictory interests between key developmental and regulatory agencies (MOA, MMR, NES, NHT) in terms of conservation, protection, utilisation and economic development of biodiversity.
- Outer Islands community leaders lack capacity to develop their own resource management regulations and by-laws where required
- Detailed implementation plan and actual activities for NBSAP not completed
- Limited effectiveness in coordination of responsibilities and of programmes
- There is no assessment of the effectiveness of the mainstreaming of biodiversity into these organisations
- New biodiversity issues are not easily understood regarding the implications at the national level

ACTIONS:

- Develop a National Biodiversity Programme and establish a coordinating body or unit to drive its implementation
- Ensure that the mandate of the coordinating body or unit for the National Biodiversity Programme includes the capacity to direct and commission inventories [population, distribution, coverage] of flora, fauna, and ecosystems in cooperation with the Natural Heritage Trust and outer island Environment Authorities.
- Develop, identify and engage relevant legal and planning personnel to improve the quality and effectiveness of legislations and CBD-specific regulations policy and action plans development.
- Integrate biodiversity priorities into national economic, development and budgetary planning processes - identify areas where capacity can be developed and design an implementation programme to address this.
- Provide trainings or regular briefings as necessary for key law and policy makers on national biodiversity issues and the implications for the Cook Islands
- Strengthen local capacity for policy development and analysis to support the development of policy frameworks specifically for biodiversity and ensure that biodiversity considerations are incorporated into relevant policies
- Establish a multi-sectoral working group to review policies and activities of Government ministries and agencies to ensure that they are consistent with a shared responsibility to maintain Cook Islands biodiversity and related knowledge.
- Strengthen the roles of the appropriate Government Ministries and Agencies, NGOs and CBOs in implementing biodiversity programmes through active participation (to promote ownership) and capacity building initiatives
- Establish a biodiversity trust fund to support the wide range of activities required to conserve Cook Islands biodiversity in an integrated and equitable manner
- Develop mechanisms for increased coordination of the activities between agencies in the conservation and sustainable use of biodiversity resources
- Enhance and strengthen the role and responsibilities of key national policy decision-making bodies such as Cook Islands Research Foundation or National Sustainable Development Taskforce as they relate to providing guidance on sustainable development policy decisions

Thematic Area: Management of Knowledge Related to Biodiversity

Deficiencies in biodiversity related information management, including documentation of traditional knowledge and practises related to customary use of biological resources, are a concern as biodiversity information and data is necessary to aid informed decision making. In general, scientific knowledge and information for biodiversity is scattered and poorly managed within different agencies and organisations. Currently, the Cook Islands Biodiversity database under the Natural Heritage Trust is the only comprehensive biodiversity database however it is limited in

scope to an inventory of species present in the Cook Islands and a bibliography of biodiversity literature. Local capacity for scientific collection of biodiversity data, including for research, is limited as well as capacity for data analysis.

Poor management of traditional knowledge and practises (TKP) related to customary use of biological resources in the Cook Islands is a major gap. Understanding of TKP in the Cook Islands is usually limited to local practitioners such as ta'unga (traditional healers), many of whom are reluctant to share their knowledge of biodiversity species used in traditional medicine due to fear of misuse and abuse by others, including foreigners. Oral history and records have been traditionally relied on to preserve knowledge however this can lead to loss of valuable information if this knowledge is not passed on. Programmes or attempts to record traditional knowledge have been inconsistent and ad hoc. Limited attempts have been made to capture traditional knowledge and practises from outer islands – each island can have different and locally specific traditional knowledge and practises based on the biological resources of that island. The Cook Islands also has poor policies and legislative frameworks in place to protect traditional knowledge and practises and the rights of the holders of such knowledge, as well as to prevent bio-piracy.

Root Causes

- No programmatic approach to initialize and guide the scientific collection of biodiversity data and knowledge
- No centralised Clearing House Mechanism or integrated biodiversity information system of past, current and on-going activities and research for stakeholders awareness and promoting linkages
- Lack of clear mandate and defined responsibilities for institutions to strengthen local and national biodiversity data collation and management capacities
- Consideration of biodiversity issues and understanding of the application of the precautionary principle in decision making is either limited or lacking in key agencies
- Maori names of biological resources especially for traditional practises are not always documented
- Limited guidelines on applications of traditional use and customary practices of biodiversity including the Ra'ui
- Lack of coordination body to oversee facilitation and monitoring of TKP related programmes and activities including rights of knowledge holders in Access and Benefit Sharing (ABS)

ACTIONS:

- Develop other key biodiversity databases while continuing to support the Natural Heritage Trust Database programme
- Maintain and periodically update the NHT database bibliography including establishing links to the National Research Registry
- Expand scope of NHT database to include more biodiversity information including population distribution of species, ecosystems and biodiversity resources.
- Develop and maintain an integrated biodiversity information system to incorporate all biodiversity information into a central comprehensive framework, including through support, resources and training of appropriate personnel as part of a national biodiversity programme
- Identify repository responsible to manage core environment data and the integrated biodiversity information system
- Develop technical capacity to undertake scientific collection of biodiversity data, including for surveying and monitoring of biodiversity, through training, short courses and practical application
- Ensure that the collection of biodiversity data is included in national biodiversity programme

- Within the host institution of Biodiversity, develop and maintain a CHM of past, current and on-going activities and research supported through the process of National Reports.
- Identify agencies or bodies with a clear role and function to record traditional knowledge and practises related to biological resources, and develop and implement consistent, systematic, ongoing recording programmes including developing appropriate technical capacity to undertake recording
- Ensure that programmes capture all island specific traditional knowledge and practises related to their biological resources

Government of the Cook Islands

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