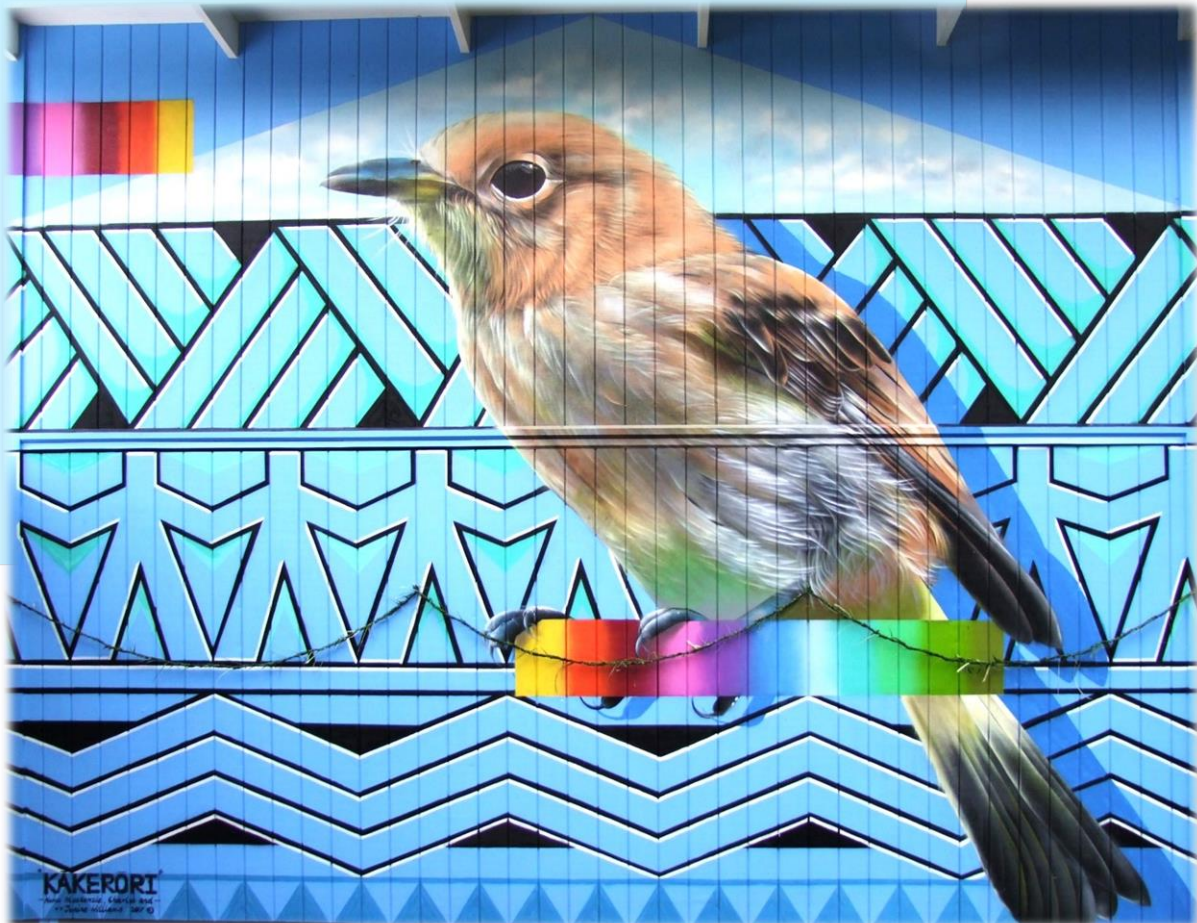


Cook Islands



5TH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY



2017



NATIONAL ENVIRONMENT SERVICE
TU'ANGA TAPOROPORO
COOK ISLANDS

Acknowledgements

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This report was prepared by Dr David Butler.

Cover photo of 'Kakerori' mural created by Charles and Janine Williams with Numangatini Mackenzie, National Environment Service office, Rarotonga, Cook Islands.

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NATIONAL ENVIRONMENT SERVICE
TU'ANGA TAPOROPORO
COOK ISLANDS



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Foreword

Kia Orana,

Te mataora nei matou i te oronga atu i teia ripoti a te Kuku Airani no runga i te Ao Ora Natura. Ko te rua o te ripoti teia a te Kuku Airani no runga i te turanga tana i rave i raro ake i te Kororomotu o te Ao Ora Natura.

Na roto i te āriki'anga i teia Kororomotu, kua papa'u tatou kia paruru e kia taporoporo'ia te Ao Ora Natura o te Kuku Airani. Kia ngakauparau tatou i te turanga ta tatou e rave nei ei akamatutu i to tatou Ao Ora Natura na roto i ta tatou peu maori, te kimi puapinga e pera katoa to tatou tu rangatira te iti Tangata Kuku Airani.

Ko tei raveia mai na i roto i te ripoti mua i te paruru i to tatou Ao Ora Natura, kua riro teia ripoti i te akako'u i te turanga matutu ta tatou i rave no te taporoporo e te paruru'anga i to tatou Ao Ora Natura te au Mariko Ao Ora no te uki ka aru mai.

Kia riro teia ripoti ei 'akairo i te turanga rangatira i ta tatou i papa'u no te paruru'anga i te Ao Ora Natura o te Kuku Airani e tuatau uatu.

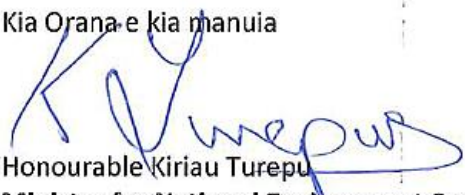
It is with great pleasure the Cook Islands submits the 5th National Report to the Convention on Biological Diversity, the second report of its kind produced by the Cook Islands.

As a party to the Convention on Biological Diversity, biodiversity conservation is an important component of our national sustainable development agenda given our close ties between biodiversity and our culture, livelihoods and heritage.

The Cook Islands first national report presented an in-depth review of the actions and activities carried out with a particular focus on threats to biodiversity and key projects that were implemented successfully. Many of these threats and projects are ongoing and this second report provides an update of the significant progress that has been made on recovery work on several threatened endemic species and on management work to eradicate or control invasive species.

It is through this report that we share our experiences in addressing biodiversity loss and conservation and reaffirm the commitment of the Cook Islands to the Convention on Biological Diversity.

Kia Orana e kia manuia



Honourable Kiriau Turepu
Minister for National Environment Service

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Executive Summary

In the five years since the Cook Islands produced a comprehensive 4th National Report, the country's terrestrial and marine ecosystems remain in generally good condition, and face limited human-induced threats as many islands undergo reductions in population and continuing reduction in agricultural activity. Significant progress has been made on recovery work on several threatened endemic species and on management work to eradicate or control invasive species.

On land, 62% of the country remains covered in native forest whose quality is rated 'good to fair'. The Cook Islands has a limited range of wetlands. Freshwater streams on Rarotonga show a deteriorating trend in water quality from 2006-12 and they also are of 'poor' quality on Aitutaki. Measures aiming to address this included a community-based Catchment Management Plan and programmes to upgrade septic tank systems.

In the marine environment, there is a positive trend of increased coral cover nationally following a previous outbreak of crown-of-thorns starfish and bleaching events. Surveys of reef invertebrates and finfish show fluctuations relating to decadal climate cycles and very limited indications of over-harvesting.

Regarding terrestrial threatened species and ecosystems, a survey of cloud forests on Rarotonga confirmed the presence of nine endemic endangered plants and identified key issues requiring management, particularly invasive species. A programme to conserve plants used for traditional medicine (*Vairakau Maori*) has developed an action plan following surveys and consultations. Actions from these activities will be included in a revised NBSAP under development. Recovery work has continued to increase the numbers of two endangered birds, the Rarotongan Monarch (*Kakerori*) and Rimatara Lorikeet (*Kura*), and surveys been undertaken for the Rarotongan Starling (*I'oi*) and the Atiu Swiftlet (*Kopeka*).

Surveys have been conducted of species that use both marine and terrestrial environments. The population of coconut crabs (*Unga*) on Mauke showed signs of overharvesting and a *ra'ui* (locally managed conservation area) has been put in place over a significant area of forest. Surveys conducted by NGO's are building up a comprehensive picture of green turtle nesting nationally.

Invasive species have received significant attention through a regional GEF/UNEP programme coordinated by SPREP including the development of a national strategy. Rats were eradicated from most of the *motu* (islets) on Suvarrow National Park and a biosecurity plan developed, and myna eradicated from Atiu. Communities tackled weeds on several islands and a major biocontrol programme continues. Climbing vines remain a major threat to some forest areas.

A declining population on the outer islands means that there is limited pressure on natural resources there and little evidence of overharvesting of reef invertebrates and fish. However some stocks, particularly giant clams, require management to recover from past over-exploitation. There are also no major problems on Rarotonga as the presence of the disease *Ciguatera* has reduced the eating of reef fish. A network of small *ra'ui* on Rarotonga shows variable effectiveness at conserving local marine resources and needs some expansion and tightening of management.

In 2012 the Cook Islands created a shark sanctuary within its waters. The development of a policy framework for a whale sanctuary declared in 2001 is underway. A multiple-use Marine Park – Marae Moana was created in 2017, also covering the country's entire marine jurisdiction, an area of 1.9 million square kilometres. Within the Park 324,000 sq. km has been earmarked for a higher level of protection with its purpose "to protect the pelagic, benthic, coral reef, coastal, and lagoon habitats of the Marae Moana and, accordingly, all seabed minerals activities and large-scale commercial fishing in the area are prohibited, but other ecologically sustainable uses are permitted".

There is evidence of the impacts of climate change including ocean acidification, coral bleaching and salt water intrusion. The country has completed its second Joint National Action Plan for Disaster Risk Management and Climate Change (JNAP) 2016-2020 to address threats and increase resilience.

The Country's first NBSAP was developed in 2001 and contained eight themes with a broad series of actions. Work has progressed within each theme though the NBSAP was not a major driver of this. The NBSAP was also developed before quantifiable targets and indicators were in wide use so assessing progress against Aichi Targets and Millennium Development Goals is problematic. The revised NBSAP will be more prescriptive to identify the priority actions needed, with associated targets and means of verification.

Chapter 1: Overview and update of Biodiversity Status, Trends and Threats

1.1 Importance of biodiversity to the Cook Islands

The country's biodiversity is vital to its future. The primary sector (Agriculture, Fishing and Pearl Industries) made up 5.7% of Gross Domestic Product (GDP) in 2012 (Ministry of Finance and Economic Management, National Accounts). That year there was a 9.3% increasing in the Fishing and Pearl Industry and a continuing decline trend in the contribution from agriculture. The 4th National Report detailed the past development of the longline fishery.

The single biggest contribution to GDP is tourism, which partly depends on the beauty of the country's land and sea environments and the native species within this. Almost every tourist visits Rarotonga and almost a quarter, Aitutaki, while the other islands receive very few international visitors. The Cook Islands Tourism Corporation's Annual Report 2015 identified that a 'beautiful natural environment' was the highest rating 'most appealing factor' for international visitors surveyed. Almost 100% of tourists visited a beach and over 80% went snorkelling, emphasising the importance of the coastal and marine environment.

The native biodiversity of the different islands has been used by generations of Cook Islanders to sustain their livelihoods and culture. Its forests protect the land and store water, its coral reefs protect the coasts, and native species provide food, medicines, building materials, and firewood and provide the country with its unique identity.

Marine resources are of particular importance to the Cook Islands and marine products are important in the diets of virtually all Cook Islanders and are a main source of protein particularly for people living in outer islands. Coastal fisheries, with participation from around 38% of all households fishing for subsistence and 4% of households in Rarotonga and 10% in Pa Enua fishing commercially for the local market (Government of Cook Islands 2017a), are vitally important; fish is an important element of food security in the Cook Islands. The FAO Food Balance Sheets show that in 2007 fish contributed an average of 21.6% of all protein to the diet, and in rural areas of the country the contributions are much higher. Marine resources and environments also occupy a central place in the historical, cultural and recreational life of Cook Island society and are accordingly also valued highly for those reasons.

The commercial marine sector is made up primarily of tuna fisheries (longline and purse seine) and the farming of black pearls. The total value of marine exports for 2012/13 was NZ\$12 million (out of total exports of NZ\$13 million). The revenue received by the Ministry of Marine Resources from treaties and fishing licenses was estimated at \$5.5 million in 2013/14. The culture of black pearls, which commenced in the 1980s, is the most important aquaculture activity in the Cook Islands. However, the value of pearl exports declined from NZD18 million in 2000 to NZD 0.3 million in 2011/12. There are also a dozen commercial sport-fishing operators in Rarotonga and Aitutaki, providing services primarily to foreign tourists. Approximately 250 game charter operators and local fishers provide regular catch sheets to the MMR. There is a considerable amount of local commercial sales of marine resources which are poorly

reported; for example, in 2013 approximately 11 tonnes of giant clam meat from the Northern Group were sold during the annual independence celebrations.

The agriculture section is also important with only 28% of households recorded as carrying out no agricultural activity in the 2011 census. Sixty-three percent engaged in agriculture for subsistence only, 8% as subsistence and commercial and 1% as fully commercial. In terms of crops grown, the census recorded 31% of households growing vegetables, spices and herbs, 43% as growing fruit and tree crops, 35% as growing flowers and 3% other.

However there has been a declining trend in agricultural activity for some decades. The proportion of households engaged in commercial and semi-commercial agricultural activity has fallen from 18 percent in 1988 to only 9 percent in 2011. Commercial production of some specific crops on specific islands such as bananas on Aitutaki and pineapples on Atiu has ceased over this period. Export of pawpaw from Rarotonga has also ceased but demand for local produce there from residents and hotels and restaurants has maintained a small but important commercial sector.

1.2 Status and trends 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 km², scattered over an area approaching the size of Western Europe, located in the tropical South Pacific (Figure 1). They are spread over an ocean area of 1.9 million km² 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, Suvarrow and Penrhyn), and a sand cay (Nassau). The Southern Group consists of four makatea (raised reef platform) 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 (Suvarrow, Takutea, and Manuae) are wildlife reserves.

Figure 1a
Map of the
Cook Islands
location and
islands

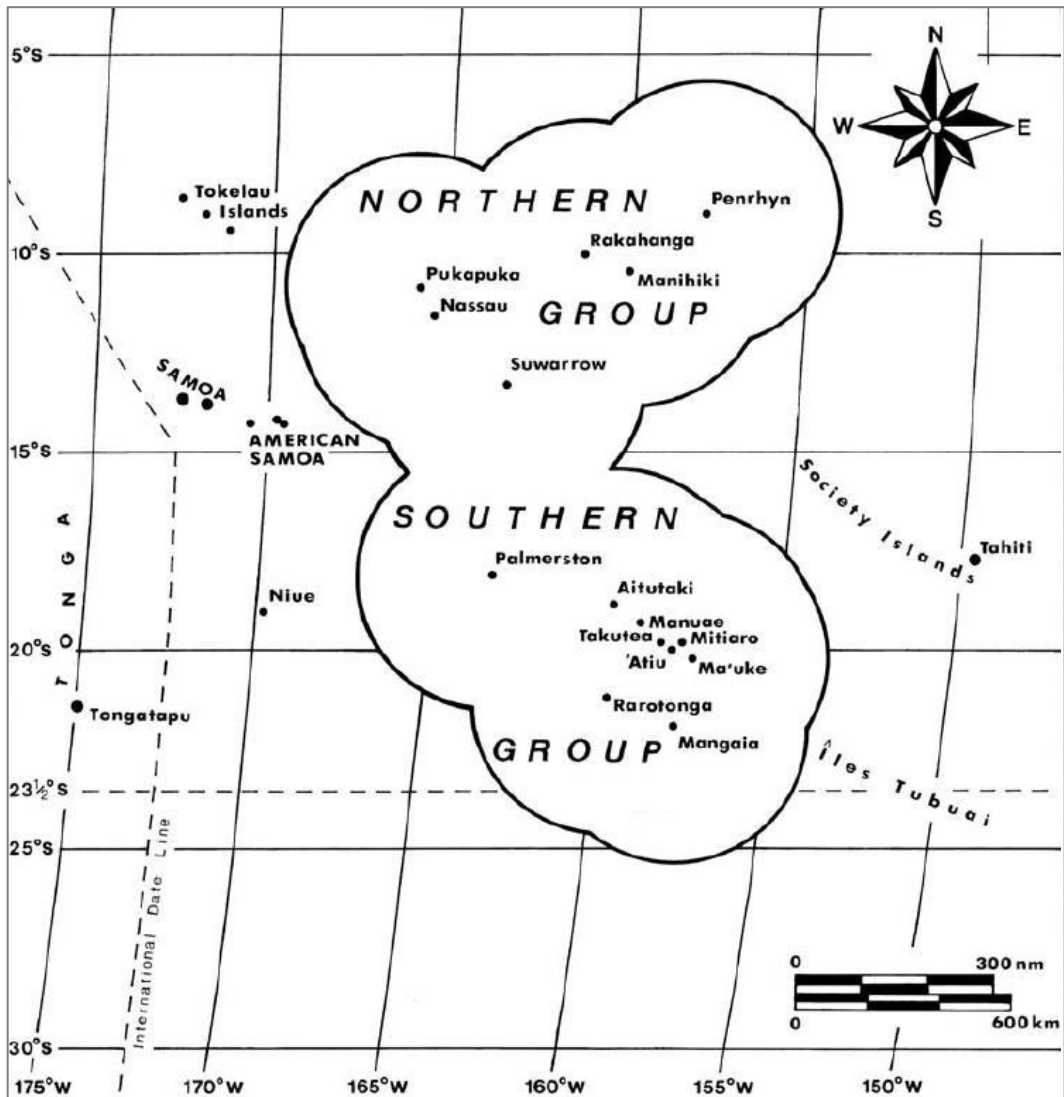




Figure 1b – Map of the islands in the Cook Islands

Figure 2 - The Cook Islands map showing the 200-nautical mile Exclusive Economic Zone Boundary.

SOURCE: (de Scally, 2008)



1.2.2 Introduction to species and habitat diversity

The diversity of species and habitats found on different islands in the region depends largely on three factors:

- Island size and landforms – generally the larger the island the more landforms it will have that allow colonisation by different species
- Island location – diversity tends to reduce from west to east in the Pacific with distance from the major source areas of Melanesia and Indo-Malaysia
- Island age – the older the island the longer the opportunity for colonisation

The Cook Islands vary markedly in size from Suvarrow Atoll (0.4km²) to Rarotonga (67km²) and in landforms from volcanic islands to coral cays as identified earlier. They are located well to the west within the chain of islands in the South Pacific between longitudes 166°W to 157°W. The volcanoes that submerged to give rise to the atolls in the Northern Cooks are 80 - 100 million years old forming soon after the Manihiki Plateau, while the Southern Group islands started forming 19 million years ago (Mangaia) and decrease in age to about 8 million years ago with a gap before Rarotonga formed. Kloosterman (1976) estimated that the Rarotongan volcano is younger and was formed during the Pliocene 2.3 - 2.8 million years ago.

The Cook Islands 4th National Report submitted in 2011 contained an island by island review with listings of the numbers of native species in different groups. This information is summarised in Table 1 with islands ordered from south to north.

Table 1: Islands and their habitats.

Island	Land Area (km ²) ¹	Highest elevation (m) ²	Island type	Terrestrial habitats	Inshore marine habitats
Rarotonga	67.4	652	Volcanic island	Cloud, upland, lowland, & coastal forests; wetlands	Fringing coral reef and shallow lagoon
Mangaia	48.3	169	Raised limestone island	Makatea forest, volcanic scrub, wetlands	Fringing reef
Mauke	19.1	29	Raised limestone island	Makatea forest	Fringing reef
Atiu	26.9	72	Raised limestone island	Makatea forest, volcanic scrub, wetlands	Fringing reef
Takutea	1.0	5	Uninhabited sand cay	Coconut forests & some Broadleaf	Fringing reef
Mitiaro	22.3	15	Raised limestone island	Makatea forest, lake	Fringing reef

¹ These figures were provided by Dan-Olaf Rasmussen, National Environment Service based on measuring polygons of areas from 2010 satellite images. For atolls, land was defined as areas with some vegetation cover.

² Source: Wood & Hay (1970)

Manuae	6.2	10	Uninhabited atoll	Coconut forests & some Broadleaf	Fringing & barrier reefs, lagoon
Aitutaki	18	124	Volcanic island/atoll	Coconut forests some Broadleaf, & wetlands	Lagoon, saltwater marshes, fringing reef
Palmerston	2.1	5.3	Atoll	Coconut forests & some Broadleaf	Lagoon, fringing reef
Suvarrow	0.4	3	Atoll	Coconut forests & some Broadleaf	Lagoon
Nassau	1.3	9	Sand cay	Coconut forests & some Broadleaf	Barrier reef, deep lagoon
Pukapuka	3.8	4	Atoll	Coconut forests & some Broadleaf	Barrier reef, deep lagoon
Manihiki	4.9	5	Atoll	Coconut forests & some Broadleaf	Lagoon, brackish ponds
Rakahanga	4	3	Atoll	Coconut forests & some Broadleaf	Lagoon
Penrhyn	10	3	Atoll	Coconut forests & some Broadleaf	Lagoon

All the atolls and sand-cays should be coconut forest with some broadleaf. (Putting broadleaf first gives a very wrong idea of their vegetation)

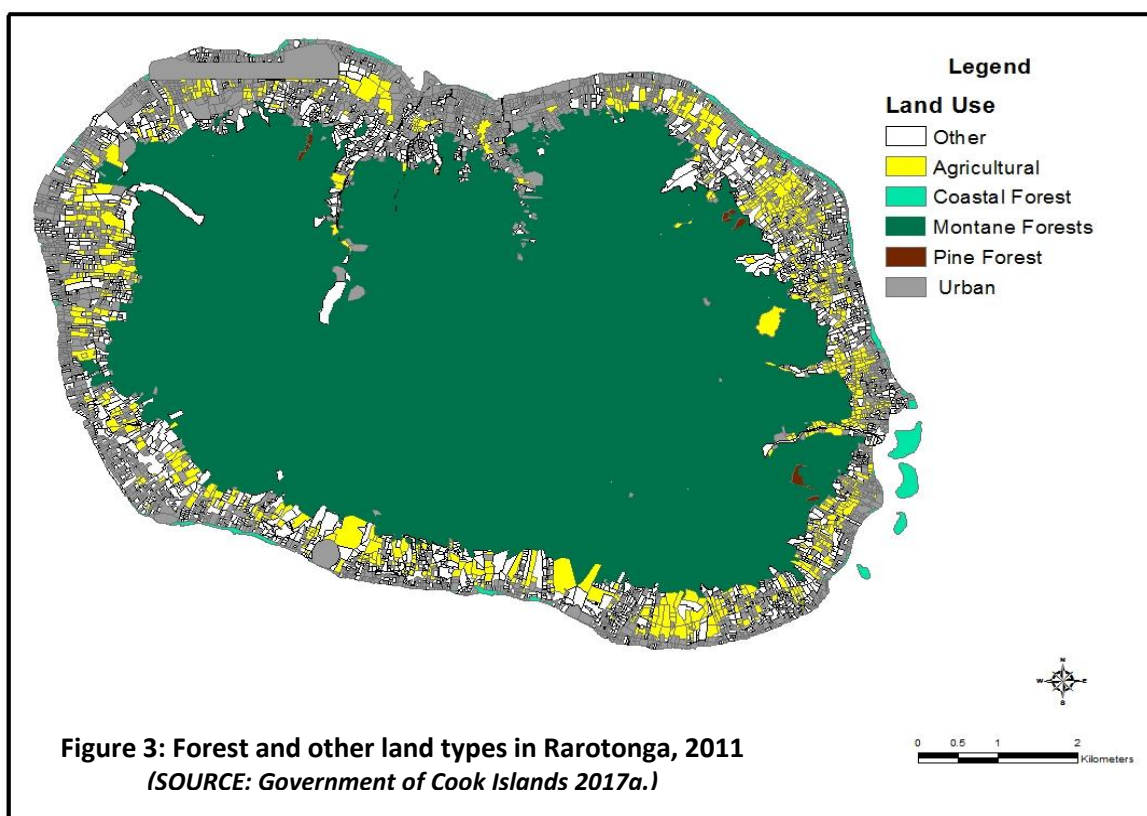
Table 2: Native biodiversity identified on different islands in the Country.

Island	No. of native species present						
	Fern & fern allies	Flowering plants	Corals & sponges	Insects	Reptiles	Birds	Mammals
Mangaia	36	107	25	23+	0	13	2
Rarotonga	94	152	81	195+	2	18	3
Mauke	23	79	35	11+	1	17	0
Atiu	26	96	11	15+	1	14	1
Takutea	4	28	Not documented	1+	0	8	1
Mitiaro	16	89	11	4+	0	9	0
Manuae	4	30	Not documented	Not documented	Not documented	8	1
Aitutaki	10	43	50	34+	1	8	2
Palmerston	3	30	Not documented	1+	3	6	0
Suvarrow	2	24	Not documented	1+	2	11	2
Nassau	3	24	Not documented	Not documented	Not documented	4	0
Pukapuka	3	32	Not documented	31+	1	15	1
Manihiki	4	28	1+	7+	1	9	0
Rakahanga	3	28	Not documented	2+	Not documented	7	0
Penrhyn	3	30	Not documented	2+	2	12	3

Forests

The 4th National report identified threats to forests on Rarotonga from people moving to occupy sites inland and this has continued though individual areas of forest lost are relatively small. Many of the higher forest areas in the centre of the island are 'uninvestigated' land and thus theoretically protected from clearance, however there are test cases in which families are attempting to claim such land. The Environment Impact Assessment (EIA) system is the key mechanism through which clearance of forest for such development is managed and controlled.

The status of Cook Islands forests is rated as 'good to fair' with very little change since a 1992 assessment (Government of Cook Islands 2017a). The country has one of the highest proportions of intact natural forests (62%) in the region and ranks third in this proportion for all Polynesian countries. This stability relates to most development having taken place on land previously cleared for agricultural, the absence of a commercial forestry industry, and significant forest on several islands covering makatea (limestone outcrops) which is unsuitable for development.



There are currently no national forest conservation programmes. The community-managed Takitumu Conservation area has measures in place to manage tree removal. Several areas of cloud forest were recently surveyed and measures identified for their conservation (see section 1.2.3).

It is instructive that a community-initiated Takuvaine Water Catchment Management Plan developed within the International Waters Project (IWP) to protect the water quality of this Rarotongan watershed (Rongo 2006) made no mention of forest clearance as a threat requiring management. The main issue

identified that could threaten the integrity of forests within the catchment was invasive species, particularly smothering vines.

Wetlands

The Cook Islands has 114.4 hectares of wetlands and 190.9 hectares of swamps (Government of Cook Islands 2017a) representing four types:

- Freshwater marshes and swamps: on Rarotonga, Mangaia, Atiu, Mitiaro and Mauke.
- Permanent freshwater lakes: Lake Tiriara on Mangaia, Lake Tiroto on Atiu, and Lake Rotonui and Lake Rotoiti on Mitiaro.
- Tidal salt marsh: at Ngatangia Harbour on Rarotonga.
- Freshwater streams: on Rarotonga and Aitutaki

The condition of freshwater streams on Rarotonga and Aitutaki is periodically measured by the Ministry of Marine Resources. Those on Rarotonga are generally in poor condition due to high bacteria and nutrient level (Government of Cook Islands 2017a). They show a deteriorating change between 2006-2011/12 due to declining levels of dissolved oxygen and decreasing water clarity. The main causes of the problem are considered to be faecal bacteria from animal manure and human sewage and these two together with inorganic fertilizers leading to the increased nitrogen levels. On Aitutaki the status of streams is also poor with generally higher levels of bacteria than Rarotonga.

Decreasing water quality can lead to increased bacteria and algae levels in the lagoon with consequent reduced productivity, negative impacts on some tourist activities, and maybe increased levels of *Ciguatera*.

Communities on Mitiaro are actively managing the harvest of eels from the lakes on that island using temporary *ra'ui*.

Coastal areas

The more accessible coastal areas throughout the country (especially on Rarotonga) have experienced a reduction in the area of natural ecosystems, including lowland forests and salt marshes and other types of wetlands. These areas remain under threat from multiple sources, including agriculture, settlement and infrastructure particularly for tourism. Resorts, hotels and smaller accommodations have been constructed and are continuing to be constructed in the coastal fringes of Rarotonga and Aitutaki. The construction of facilities along coast lines, often with sea walls and jetties, can impact on sea currents and sediment build up, as well as erosion. In the lagoons, the localised removal of coral heads to provide rock free swimming areas has fragmented and altered habitat critical for reef fish and other species.

Marine habitats

In the most recent published assessment of the state of coral reefs globally, Cook Islands' reefs were identified as in a recovery stage after a crown-of-thorns starfish (COTS) outbreak that started around 1995. All sites surveyed were dominated by algae, with large populations of urchins present. Soft corals

were present, indicating an early recovery stage of the reef. Another positive sign was the absence of recently dead coral, apparently stable populations of corals and no evidence of COTS (Vieux et al. 2008). A positive trend of increasing coral cover has generally continued since then across the country, with the most detailed information available for Rarotonga in a series of surveys (below).

Coral reef monitoring on Rarotonga has been ongoing for around 20 years, with surveys conducted in 1994, 1999, 2000, 2003, 2006, 2009, 2011, and 2014 (Rongo et al. 2015). These surveys showed that the COTS outbreak that occurred from 1995 to 2001, and to a lesser extent storm surges associated with the 2003 to 2005 cyclones and several coral bleaching events, were the main causes of the degraded state of Rarotonga's fore reef communities for much of the 2000's. Mean coral cover was around 5% in 2009, around 8% in 2011, and 16% in 2014, which clearly showed that coral communities on the fore reef have been recovering since 2006.

1.2.3. Updated information on species and habitats since 4th National Report

This section summarizes information collected from recent surveys, management and research programmes.

Native Terrestrial biodiversity

Rarotonga Cloud Forest survey, catchment management and restoration planning

A three-week field survey of cloud forest habitats incorporating three mountain peaks was carried out in May 2015 (Wildlands Consultants 2016). It was aimed at information gathering to help protect and enhance the cloud forests of Rarotonga so that their indigenous ecosystems, habitats for endemic species, and water supply functions are preserved in perpetuity. Rarotonga's cloud forests are critical for the conservation of endemic flora, providing habitat for eight of the island's 10 endemic flora listed by the IUCN as "Critically Endangered", "Endangered", or "Vulnerable".

The 2015 survey identified 107 vascular plant species and most vegetation communities were dominated by indigenous species. Three of nine endemic plant species listed by the IUCN as 'critically endangered' or 'endangered' were located: *Coprosma laevigata*, *Cyrtandra lilianae* and *Sclerotheca viridiflora*. Based on their rarity, growth form and ecological niches, ex-situ conservation programmes were recommended for the following threatened plant species beginning with cultivation trials using seed or cuttings:

- Rarotonga Garnotia-Grass (*Garnotia cheesemanii*)
- Rarotonga Psychotria (*Psychotria whistleri*)
- Rarotonga Sclerotheca (*Sclerotheca viridifolia*)
- Te Manga Cyrtandra (*Cyrtandra lilianae*)

Indigenous non-vascular flora, including lichens, mosses, and liverworts, were abundant and further study of the specimens collected is likely to result in many new species records for the Cook Islands. Twelve species of landsnails were found of which four were indigenous and eight were introduced, and one or more species of undescribed endemic *Lamprocystis* were found on the peak of Te Kou, along with the endemics *Lamprocystis globosa* and *Lamprocystis venosa*. Fourteen species of ants, wasps and a honey-bee in seven families of Hymenoptera were recorded. The continued presence of herald petrels (*Pterodroma heraldica*) was confirmed though potential nesting areas were inaccessible.



*Te Manga - Te Atukura
ridgeline viewed from
eastern summit of Te
Manga*

(SOURCE: Tim Martin)

The cloud forests of Rarotonga were assessed as meeting three of the four criteria for recognition as a Key Biodiversity Area (Table 3).

Table 3: Assessment of Rarotonga cloud forests against the KBA criteria.

Criterion	Assessment	Justification
1. Globally threatened species	Yes	Key site for eight vascular plant species that are globally threatened.
2. Restricted range species	Yes	Supports all of the global population for several landsnail species and two vascular plant species.
3. Congregatory species	No	No congregatory species are present in large numbers.
4. Biome-restricted assemblages	Yes	One of the largest remaining areas of small-island low-altitude cloud forest. Retains almost the full suite of plant species and genera restricted to cloud forest habitats of the tropical Pacific.

The survey identified several threats to cloud forest ecosystems. Invasive plants such as white-flowered ginger (*Hedygium coronarium*) and night-blooming cestrum (*Cestrum nocturnum*) appeared to slowly be increasing in range and abundance and site-led weed control programmes were outlined. Invasive ants were located and rats will be a threat to ground-nesting seabirds. Climate change is a particular threat as the biota of cloud forests has very specific environmental requirements (e.g. high humidity and cloud cover) and could be displaced through increasing temperatures leading to the upward migration of lower altitude species.

Conservation of rare *Vairakau Maori* (traditional medicine) plants on Mauke and Atiu

This programme was undertaken by the Integrated Island Biodiversity Project based at the National Environment Service, with support from GEF, UNEP and SPREP. It aimed to prepare a programme for the protection and conservation of rare *Vairakau Maori* plants, based on the premise that the way to achieve this is to encourage practitioners to continue to practice their medicine. Three-quarters of the species of *Vairakau maori* plants listed as 'rare' in the Cook Islands Biodiversity Database are found on the Southern Group Islands of Aitutaki, Mitiaro, Atiu, Mauke and Mangaia.



Vairakau maori ingredients and tools (SOURCE: E Munro)

Local consulting group *Te Enuā, Te Moana e Te Rangi* undertook surveys on Atiu and Mauke in 2013/14 interviewing *Ta'unga Vairakau Maori* (traditional medicine practitioners) and locating plants. An Action Plan was developed that focused on four elements:

- Update rare *Vairakau Maori* plant information
- Deal with threats to rare *Vairakau maori* plants
- Inform people about rare *Vairakau maori* plants
- Encourage *Ta'unga Vairakau* to continue practicing *Vairakau maori*.

Case study: *Mata'oi* on Atiu

According to Kau Henry, a member of the *Roro Enuā o Enuamanu* there are only 5 *Mata'oi* (*Cananga odorata*) trees left on the island of Atiu. These were located during the consultation visit to the Island of Atiu and plotted using a GPS. With the decline in the island's population in the last five years, the use of *Mata'oi*, not only for making *vairakau*, but also for making 'ei (garlands) – has declined. With this decline few people, except for those that use the plant for *vairakau*, know where they are found.

***Mata'oi*
(*Cananga odorata*)
flowers and fruit.**

(SOURCE: Cook Natural
Heritage Trust/ Gerald
McCormack)



Identification of Important Bird Areas (IBA's) and Key Biodiversity Areas (KBA's)

The Cook Islands has 36 resident bird species, including six endemics and 15 that are globally threatened. A recent report identified IBA's and KBA's in the Cook Islands (Evans 2012). There are nine terrestrial and marine IBA's in the Cook Islands (Table 4) and 18 KBA's (Tables 4 & 5).

Table 4: Important Bird Areas of Cook Islands (SOURCE: Birdlife International Cook Islands Country Profile)

Name	Area (ha)	Habitat
Mitiaro	3,000	Terrestrial
Atiu	2,690	Terrestrial
Mangaia	5,200	Terrestrial
Suvarrow Atoll National Park	162	Terrestrial
Takutea Wildlife Sanctuary	127	Terrestrial
Takitumu Conservation Area, Rarotonga	155	Terrestrial
Aitutaki	1,800	Terrestrial
Suvarrow Atoll Marine	1,240	Marine
Takutea Marine	762	Marine

Table 5: Key Biodiversity Areas of Cook Islands

Name	Area (ha)	Habitat
The 9 IBA's in Table 4 are also identified as KBA's	As Table 4	Terrestrial & marine
Te Manga-Te Kou Cloud Forest	118	Terrestrial
Takuvaine Water Catchment ³	229	Terrestrial
Mauke Island	2,000	Terrestrial
Rarotonga Marine	1,600	Marine
Palmerston Marine	5,400	Marine
Pukapuka Marine	2,800	Marine
Tongareva Marine	22,700	Marine
Manihiki Marine	5,200	Marine
Rakahanga Marine	700	Marine

Areas were identified largely on the basis of the presence of 'trigger species'. As examples, Atiu has been identified as a KBA and IBA because of five bird species, five landsnails, an endemic plant and two species of marine turtle. Takutea is an IBA because of its globally significant population of red-tailed tropicbird.

³ This area is not considered by some local scientists to be of particularly high biodiversity value but it is however already under community-based conservation management.

Aitutaki qualifies as a KBA/IBA because of two bird species, six landsnails, an endemic spider and a coral reef fish, the humphead wrasse.

Conservation of Rarotonga Monarch (*Pomarea dimidiata*) or *Kakerori*

The *Kakerori* has been subject to a conservation programme since 1989. From a low of only 29 birds, the population was estimated at c.380 birds, including 69 yearlings by August 2011 (supplemented by data from July 2011) (Robertson et al. 2011, H. Robertson in litt. 2011), suggesting a population of c.310 mature individuals. Between 2001 and 2003 30 birds were introduced to Atiu to establish a reserve population on an island free of ship rats. This Atiu population currently numbers 50-100 individuals and they largely occupy forests on the makatea where there is a significant area available and few threats.

Conservation of Rimitara lorikeet (*Vini kuhlii*) or *Kura* on Atiu & Mitiaro

Twenty seven of this endangered bird were translocated from Rimatara, French Polynesia to Atiu in the Cook Islands in April 2007, part of their historic range, in an effort to establish a second population. The introduction appears to have been successful with breeding recorded in the first 15 months and four birds seen on Mitiaro 50km away after two months. Subsequent population estimates were c.40 birds in 2009, 90 ± 19 birds in 2010 and 92 ± 24 birds in 2011 although the 2011 estimate is likely to be an underestimate due to observer error (Malcolm 2011, R. Malcolm in litt. 2012). The early results of a census in 2016 indicate that the population on Atiu is between 300 and 500 birds and they are widely distributed in the inland horticultural area (Gerald McCormack Unpubl. data). The small group of four *Kura* moved to Mitiaro in 2007, with only three *Kura* found during the 2016 census.



***Kura* or Rimitara lorikeet on Atiu.
(SOURCE: Te Ipukarea Society)**

Survey of Rarotonga starling (*Aplonis cinerascens*) or *I'oi*

Starlings were surveyed in nine valleys of Rarotonga using distance sampling with 15-minute point counts (Easby & Compton 2013). Densities varied between zero and 0.95/hectare at different points with an average of 0.51/hectare leading to a conservative estimate of 2,350 adult birds for the total population. This suggests that the current IUCN status of 'vulnerable' is appropriate. Highest densities of birds were in the Takitumu Conservation Area where rats are controlled and lowest numbers in valleys where there were large infestations of introduced climbing vines, indicating that invasive species may be a key threat.

Survey of Atiu swiflet (*Collocalia sawtelli*)

A survey was carried out of the two nesting caves on Atiu in 2012/13 giving a mean population estimate of 416 birds (McCormack 2013). Indications are that there has been a 21% decline in numbers at one of

the caves. A transfer of birds to another island that had swiftlets in the past has been advocated as a means of reducing the extinction risk for this vulnerable species.

Mauke Island *'unga* (coconut crab) survey (Matamaki et al., 2016).

This survey undertaken in October 2015 and coordinated by the National Environment Service with assistance from the Secretariat of the Pacific Community (SPC) was the first such assessment in the Cook Islands. It aimed to collect information on population size, structure and distribution to establish a baseline and provide recommendations for management. Crabs were found to be confined to the coastal region and the catch per unit effort (CPUE) suggested a density of 15 crabs/acre and an estimated population of 22,785 (± 4830). The CPUEs were similar inside a *ra'ui* (community-managed protected area) set up to conserve crabs and outside this. The CPUEs and the age structure were characteristic of a population heavily impacted by over-harvesting.

As a result of the survey, the Mauke community is developing management regulations that will prohibit the taking of smaller crabs and females carrying eggs and establish further *ra'ui*. A seasonal closure to hunting and a ban on exports were also proposed. Other islands already have some of these measures in place: on Manihiki coconut crabs can be consumed only on the island and on Atiu and Mitiaro it is prohibited to harvesting crabs less than 50mm in thoracic length and egg-bearing females.

Community members from Mangaia and Atiu also participated to facilitate similar surveys being carried out on their islands. A similar survey was carried out on Mangaia in October 2016.

Native Marine biodiversity

Coral Reefs

Coral reefs in the southern group of the Cook Islands were found to be in good health with good coral coverage during a 2013 survey by a team of government officials and individuals from non-governmental organisations who travelled to the islands of Aitutaki, Manuae, Mitiaro, Takutea, and Atiu (Rongo et al. 2013).

A repeat survey of Rarotonga fore reefs in 2014 showed a significant increase of larger coral colonies in 2014 when compared with 2006 (Rongo et al. 2015). Although acanthurids (e.g. surgeonfish *Ctenochaetus striatus*) showed a sudden increase in 2006, their abundance with most other fish species surveyed has remained relatively stable from 2009 and onwards. On the other hand, coral-associated pomacentrids (damselfish) and chaetodontids (butterflyfish) showed an increase since 2006, which is consistent with the increase in hard coral cover during this recovery period.

A series of surveys of marine invertebrates have been carried out in different islands in recent years (SPC, 2013, George & Kea 2014a, 2014b, George & Story 2014, George et al. 2014, 2015). These indicate over-exploitation of some species at some sites and recovery at others after conservation measures were put in place. A 2013 survey of sea cucumbers across Aitutaki, Mangaia, Palmerston & Rarotonga found densities of lollyfish and surf redfish to be above 'regional healthy densities', however greenfish were below this level and absent from one island (SPC 2013). Past commercial exploitation of surf redfish had been halted due to inadequate resource management. Subsequent surveys of two additional northern

atolls found them to be low in sea cucumber species recorded and size structures with no commercial potential (George & Story 2014). Giant clams were abundant on Manihiki which was considered to result from a ban on exports and a *ra'ui* in place. Surveys of Mauke and Mitiaro which have very narrow reef habitats also found low sea cucumber populations and size structures (George & Kea 2014). There had been significant declines in giant clams, large worm shells and rough turban shells which were important local food resources since 2009 and *ra'ui* were needed. Pukupuka had low densities and small sizes of sea cucumbers and very low densities of giant clams (George et al 2014).

Rarotonga has a significant number of marine *ra'ui* (section 1.2.4). Assessments of invertebrates and finfish were carried out during 2013 (George et al. 2015) and found a decline in the majority of invertebrate resources since previous surveys. The two best sites were Edgewater with the highest densities for five invertebrates and Tikioki with highest finfish biomass. It was identified that some harvesting takes place in the *ra'ui* and responsibilities for compliance and monitoring are not clearly defined, leading to an on-going discussion between the Aronga Mana (traditional leaders), community and the government agencies.

In 2014 a further assessment was carried out at Kavera following a proposal to create a *ra'ui* there as a nursery area for the rejuvenation of marine invertebrates that are heavily harvested in the area (George & Kea 2014). The survey found eleven invertebrate resources in the *ra'ui* area and only nine at a similar unprotected site, with very high densities of two sea cucumbers (*Rori toto* and *Rori Pua*) and sea urchins (*Kina*) at both sites.

Cook Islands Turtle Project

Since 2009 the Cook Islands Turtle Project (CITP), a collaborative research programme led by the Pacific Islands Conservation Initiative (PICl), has surveyed and recorded baseline data on habitat suitability, nesting frequency and nest distribution of turtles on several islands (Table 6 below). PICl aims to achieve a complete national survey over 3-5 years and to coordinate repeat surveys to build up a picture of the status and trends of the breeding population. All nests found to date are considered to be of green turtles (*Chelonia mydas*) though hawksbill (*Eretmochelys imbricata*) and loggerhead turtles (*Caretta caretta*) have also been recorded in Cook Islands waters.



**Turtle nest, Poutukava Beach, Mauke
- 130 eggs laid and 122 hatched
(SOURCE: PICl)**

Table 6: Findings of recent turtle surveys

Island	Nests found	Comments
Rarotonga (White 2013) (PICI 2015)	None but 15km of beach suitable for nesting	Turtles resident year round and most abundant in Papua, Avarua and Rutaki passages. More green than hawksbill.
Mangaia (PICI 2015)	None and no suitable nesting sites	Turtle encounters confined to Avarua Harbour
Aitutaki (PICI 2013, 2015)	2012/13 - 6 were found. None but several beaches and motu suitable for nesting.	There was evidence of older nests from previous years on some motu as well as evidence of nests laid outside of the nesting season (November – February). Turtles in lagoon year round.
Mauke 2011/12 (Bradshaw & Bradshaw 2012)	Seven found and 3 more 'possible'. 1.1km of beach suitable for nesting.	Turtles present year round but most common during nesting (Dec-Mar). Some take of adults and eggs.
2012/2013 (PICI 2013)	None found.	Surveys conducted by Environment Officer on the 10 beaches identified as suitable by previous expedition.
Atiu 2013 (PICI 2013)	None found.	Anecdotal evidence suggests no significant nesting on the island for over thirty years.
2014/15 (Lyon, <i>S. pers comm.</i>)	None found and none were reported by the community.	Beaches that appear as suitable as those used on Mauke or Mitiaro are present.
Palmerston 2012 (White 2012)	179 were found.	There were reports of the presence of loggerhead turtles which may nest there.
Mitiaro 2014	2 nests found	Nesting was not traditionally known from Mitiaro
Penrhyn (White 2014)	523 found.	Most nests on Mangarongaro

Management of harvested fish stocks

The Cook Islands has a significant longline fishery targeting several tuna species (Table 7) and a small fishery trolling for albacore tuna (Table 8) with only 1 boat active in recent years compared to four in 2003 and 2004 with a peak catch of 688 tonnes (WCPFC 2014).

Table 7: Number of vessels and catches (tonnes) for Cook Island longliners

Year	2010	2011	2012	2013	2014
Vessels Active	17	24	24	24	13
Albacore	2423	2182	2757	1354	1276
Bigeye	319	925	1624	208	194
Yellow -fin	192	394	693	346	553

Blue Marlin	43	39	93	35	33
Black Marlin	19	24	37	11	11
Striped Marlin	24	16	28	12	20
Swordfish	78	41	140	16	14
Blue shark	20	-	23	7	1
Silky shark	15	18	17	5	0
Other	124	135	308	40	137
Total	3257	3774	5720	2034	2239

(Source: WCPFC 2014)

Table 8: Number of vessels active and albacore catches (tonnes) for Cook Island trollers

Year	2010	2011	2012	2013	2014
Vessels Active	0	0	0	0	1
Albacore Catch	0	0	0	0	21

(Source: WCPFC 2014)

A Cook Islands Offshore Fisheries Policy was produced by the Ministry of Marine Resources, assisted by the SPC in 2013. Its purpose is to ensure sustainable resource management, to make optimal use of fishery resources, to enhance food security by minimising interaction with coastal fisheries, and exercising national rights.

The Cook Islands Exclusive Economic Zone (EEZ) South Pacific albacore longline fishery has become the first Chinese tuna fleet to be certified to the Marine Stewardship Council (MSC) Fisheries Standard. The fishery produces 2,300 tonnes of tuna per annum.

Since 2013, Anova USA/ Fishing & Living has been involved in the Cook Islands Fishery Improvement Project for the Cook Islands pelagic longline fishery, as a co-operating partner with Luen Thai Fishing Venture. The FIP covers all vessels that are participating in the Cook Islands longline fishery, and covers south Pacific albacore tuna and western and central Pacific yellowfin tuna, which are the two main market species caught in the fishery. The FIP covers these two stocks caught both within the Cook Islands Exclusive Economic Zone (EEZ) and on the adjacent high seas.

In October 2016 the Government signed a Sustainable Fisheries Partnership Agreement (SFPA) with the European Union under which the Cook Islands will receive \$9.6 million over a 4-year period in return for providing access to four European flagged purse seine fishing vessels which will target the migratory and abundant skipjack tuna. The agreement includes a protocol to fish up to 7,000 tonnes per annum – around 156 fishing days or 12 per cent of the Cook Islands' 1250 fishing day quota set by the Western and Central Pacific Fisheries Commission (WCPFC).

MMR has written that; *“The fishing opportunities to be granted by the SFPA are based on the best available scientific advice, in line with the conservation and management measures of the WCPFC. MMR remains committed to best practice precautionary management of stocks in our exclusive economic zone through its mandate under the Marine Resources Act 2005 to ensure stocks remain healthy and to maximize the ecological and economic benefit in the long term for the people of the Cook Islands”*. (Media Release 17 October 2016).

This agreement is controversial. The *Aronga Mana* or traditional leaders of the Cook Islands, who have been invested with titles in accordance with native custom and usage are the *“tiaki* or guardians and protectors” of the food resources of the sea in accordance with native custom and usage of the Cook

Islands. Between 17 and 24 October 2016, the *Aronga Mana o Te Au o Tonga* and Te Ipukarea Society filed a Judicial Review in the High Court.

The *Aronga Mana o Te Au o Tonga* claims there was a lack of consultation with traditional leaders as under the Cook Islands Constitution, traditional leaders are recognised as the guardians of our natural resources. Both the *Aronga Mana o Te Au o Tonga* and Te Ipukarea Society in their case claim that an Environmental Impact Assessment must be carried out for this activity. For TIS, there was no proper regard to any or sufficient, scientific evidence on the impact of purse seine activities on by-catch species, including yellow fin tuna and particularly big-eye tuna. TIS is also concerned with the impact of using fish aggregation devices on by-catch species and non- target species, particularly whale sharks, sharks and sea turtles.

Invasive species management programmes

Eradication of rats on Suwarrow 2013.

Suwarrow Island is a National Park with globally significant seabird populations, consisting of 30 *motu* (islets) fringed around a lagoon with a landmass of c.1.68sq km. Pacific rats were detected on one *motu* in 2008 during a seabird survey and four *motu* were later found to be infested. In May 2013 the National Environment Service, Te Ipukarea Society and Birdlife International carried out a ground poisoning operation using the toxin brodifacoum (Munro 2015). Initial indications were that the operation had been successful, but in 2016 rats were observed on one *motu*, Motu Tou. A draft Biosecurity Plan has been developed to minimise the risks of rats becoming re-established in the future, but a further eradication effort is now required with planning in place for 2017.

Eradication of myna birds on Atiu.

A major programme was initiated on Atiu (2693ha) in 2009 aiming to reduce the numbers of myna to increase the productivity of *kakerori* and Rimatara lorikeet recently introduced to the island, and in 2011 the decision was made to attempt an eradication. A programme developed and coordinated by the Cook Island Natural Heritage Trust has carried out a combination of poisoning, trapping and shooting. In October 2016 it was considered that the eradication has been successful – a remarkable achievement, with the shooting of the last four birds. In total about 24,000 mynas were killed during the seven year programme. There have been no verified reports of mynas since October.

The myna was introduced to the outer islands in the early 1900s to control the Coconut Stick-insect. Since 2013 some areas of coconut palms have been badly damaged by this insect and options are being considered to manage it, such as clearing weeds from plantations and planting more palms. The local native birds have increased in numbers and are much more visible (Gerald McCormack *pers. comm.*).

Biocontrol of weeds.

A weed biocontrol scoping study was carried out in 2012 by Landcare Research (Paynter & Lloyd 2012). It identified 41 priority weed species of which a smaller number were suitable for biocontrol in the near term. Two species, the giant sensitive plant (*Mimosa invisa*) and lantana (*Lantana camara*), were not included because they are already well controlled by biocontrol agents that have been introduced to the Cook Islands. Eight species were identified for initial work and several agents, including *Heliconius erato cyrba* for biological control of *Passiflora rubra* (red passionfruit), have been successfully released in the

wild. *Heliconius erato* has established on Rarotonga and is successfully controlling the target plant although it is too early to see widespread decline. Before any of these Biocontrol species can be introduced to the Cook Islands, an EIA process is undertaken by the National Environment Authority for approval.

Management of pest invertebrates

Eradication of Oriental fruit fly (*Bactrocera dorsalis*)

This species, one of the most destructive species of fruit and vegetable-infesting flies in the world, was found in Rarotonga and Aitutaki in May 2013. It was successfully eradicated in September 2014 by a major programme by the Ministry of Agriculture, with the assistance of National Environment Service and Ministry of Health at a cost of over \$246,000 (Cook Islands Government \$110,000, SPC \$80,000, New Zealand Government \$35,000 and Aitutaki Island Council \$21,000) together with the services of three technical experts from SPC and three entomologists from New Zealand.

Studies of no-see-'em biting-midge (*Culicoides belkini*)

This sand-fly is a recent arrival on two islands and is small enough to pass through mosquito screens so that communities find it a significant annoyance. The Cook Islands Natural Heritage Trust organised a team of international experts to visit Aitutaki and Mitiaro in 2015, funded by the NES - GEF-PAS Invasive Alien Species (IAS) Project to study this species and identify its breeding sites (McCormack 2015). The midges were observed breeding on the edge of a small swamp on Aitutaki, where follow-up control work is planned, and in the large central swampland on Mitiaro.

Community-based weed control programmes

Red passion fruit - Mauke

Munro & Kaokao (2015) reported on behalf of NES and the GEF-PAS funded Invasive Alien Species Project on a programme to control red passion-fruit (*Passiflora rubra*) which is confined to a single site on Mauke. There have been several previous attempts to eradicate this plant from 2001 onwards, and the latest effort was initiated in 2007 led by the Environment Officer based on the island. There have been no sightings of mature red passion-fruit since 2013 and all juveniles have been killed. However there are increasing numbers of seedlings germinating from dormant seeds in the ground. Ongoing consistent efforts are needed to ensure that the seedlings are destroyed before they reach fruit-bearing age.

Beach burr - Pukapuka

A survey was carried out in May 2015 to identify the status and distribution of beach burr (*Cenchrus echinatus*) (or piripiri or parango) on Pukapuka and determine the best management method to control its spread (Munro et al. 2015). Beach burr was located on all three *motu* of Pukapuka, particularly around dwellings, access roads and a sportsground. Several significant areas were cleared of the weed by the survey team and community members.

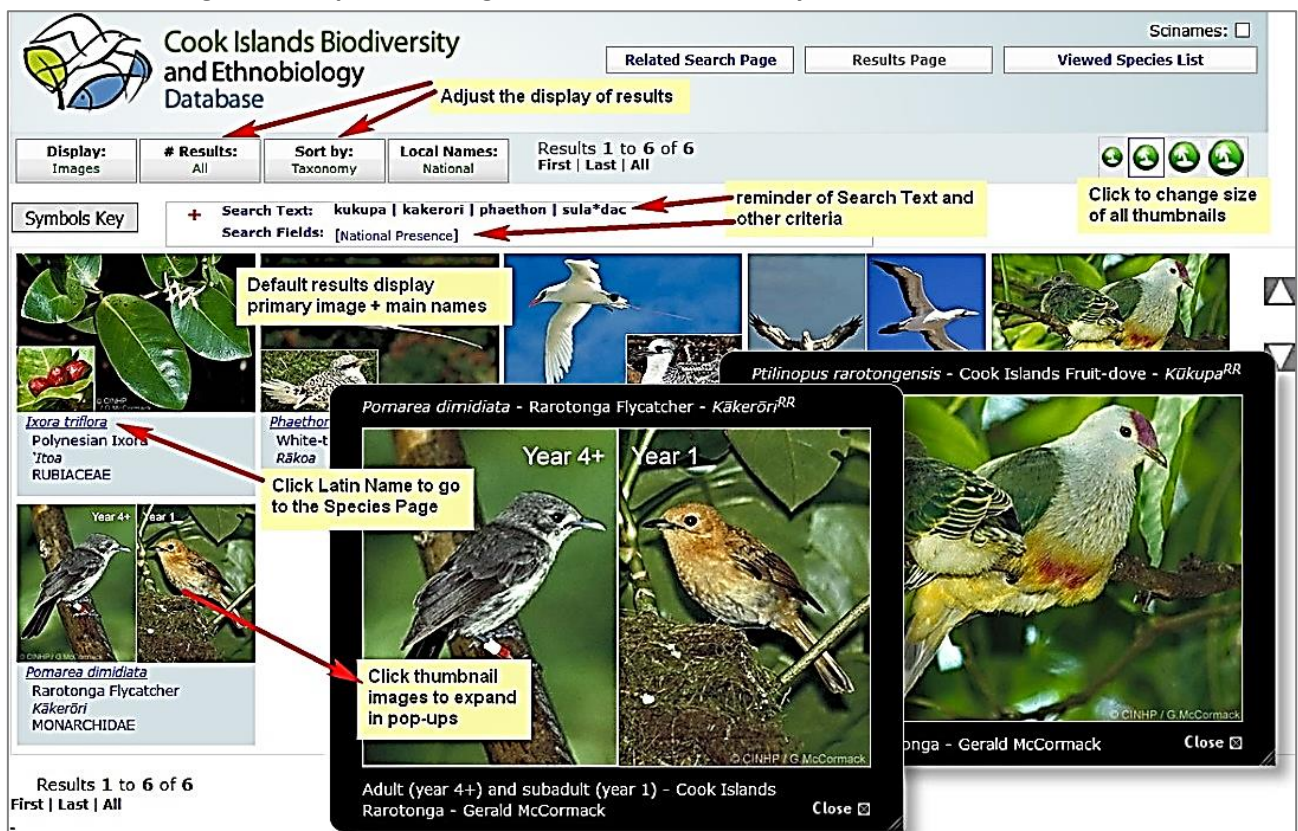
Information management

Cook Islands Biodiversity Database

The Cook Islands biodiversity database (<http://cookislands.bishopmuseum.org>) developed and managed by the Cook Islands Natural Heritage Trust is currently undergoing a comprehensive re-development, partially supported by the GEF-PAS Integrated Island Biodiversity Project.

The 'general user interface' is currently being finalised with the completion of functions to allow approved users to upload photos and provide data (e.g. counts). Further work is planned on editorial systems so that all data can be edited and new data added. There are c1000 new species to be added once this is complete, mostly insects and fungi. Figure 4 indicates how the new database will readily provide the user with a range of options for searching and displaying information.

Figure 4: Graphic showing some of the functionality of the new database.



SOURCE: Cook Islands Natural Heritage Trust

1.2.4. Protected Areas

The country's protected areas are listed/tabulated in several documents/websites but there are significant differences between each. Table 9 below presents the current available information full list though some dates of establishment are unrecorded.

Table 9: Protected Areas in the Cook Islands

Area	Designation	Island	Area (km ²)	Category	Date of establishment
Suvarrow National Park	National Park	Suvarrow	12.4/1.62	Marine/Terrestrial	1978
Takitumu Conservation Area	Other Area	Rarotonga	1.55	Terrestrial	1996
Takutea Wildlife Sanctuary	Other Area	Takutea	7.6/1.2	Marine/Terrestrial	1903 (re-established 1950)
Highland Paradise	Local Nature Reserve	Rarotonga	0.32	Terrestrial	Unknown
Moko'ero Nui	Nature Reserve	Atiu	1.2	Terrestrial	2014
Maina Reserve	Reserve	Aitutaki	0.8	Terrestrial	est. 1981
Te Miromiro	Ra'ui	Atiu	0.11/0.09	Marine/Terrestrial	Unknown
Te Ana	Ra'ui	Atiu	0.019	Terrestrial	Unknown
Tikioki	Ra'ui motukore	Rarotonga	0.4	Marine	1998
Aroa	Ra'ui	Rarotonga	0.325	Marine	2006
Pouara	Ra'ui	Rarotonga	0.05	Marine	2006
Titikaveka	Ra'ui	Rarotonga	0.5	Marine	1998
Aroko	Ra'ui	Rarotonga	0.71 or 0.87	Marine	1998
Tokerau	Ra'ui	Rarotonga	0.04	Marine	2007
Maina Lagoon	Ra'ui	Aitutaki	0?	Marine	2000
Ootu	Ra'ui motukore	Aitutaki	0.02	Marine	2000
Motu Kitiu	Ra'ui	Aitutaki	0.4	Marine	2000
Veitatei Ra'ui	Ra'ui	Mangaia	0.06	Marine	Unknown
Keia Ra'ui	Ra'ui	Mangaia	0.38	Marine	Unknown
Tavaenga Ra'ui	Ra'ui	Mangaia	0.32	Marine	Unknown
Tamarua Ra'ui	Ra'ui	Mangaia	0.19	Marine	Unknown
Keia Puna	Ra'ui	Mangaia	7.42	Terrestrial	2014
Tavaenga Puna	Ra'ui	Mangaia	11.5	Terrestrial	2014
Mangaia Tanga'eo Sanctuary	Ra'ui	Mangaia	48.35	Terrestrial (Entire Island)	2016
Unga Ra'ui	Ra'ui	Mauke	2.67	Terrestrial	Unknown
Auru	Ra'ui	Mauke	0.43	Terrestrial	Unknown
Kakemaunga	Ra'ui	Mauke	0.13	Terrestrial	Unknown
Patito Inaio	Ra'ui	Mauke	0.05	Marine	Unknown
Te Roto Nui	Ra'ui	Mitiaro	1.14	Freshwater	Unknown

Te Roto Iti	Ra'ui	Mitiaro	?	Freshwater	Unknown
Oponui te Vai	Ra'ui	Mitiaro	0.23	Marine	Unknown
Motu Kotawa	Ra'ui	Pukapuka	0.09	Marine & terrestrial	Unknown
Motu Ko	Ra'ui	Pukapuka	0.3	Marine & terrestrial	Unknown
Te Taha ki Raro	Ra'ui	Rakahanga	3.24	Marine	Unknown
Paerangi	Ra'ui	Rakahanga	0.44	Marine	Unknown
Te Kainga	Ra'ui	Rakahanga	0.06	Marine & terrestrial	Unknown
Motu Porea & Tepuka, Paeroa	Ra'ui	Manihiki	0.25/0.15	Marine	Unknown
Marae Moana	Marine Park	National	1.9 million	Marine	2012

(Primary source: www.protectedplanet.net, 4th National Report to the CBD, Ridge to Reef Community Consultations).

Cook Islands Marine Park – Marae Moana

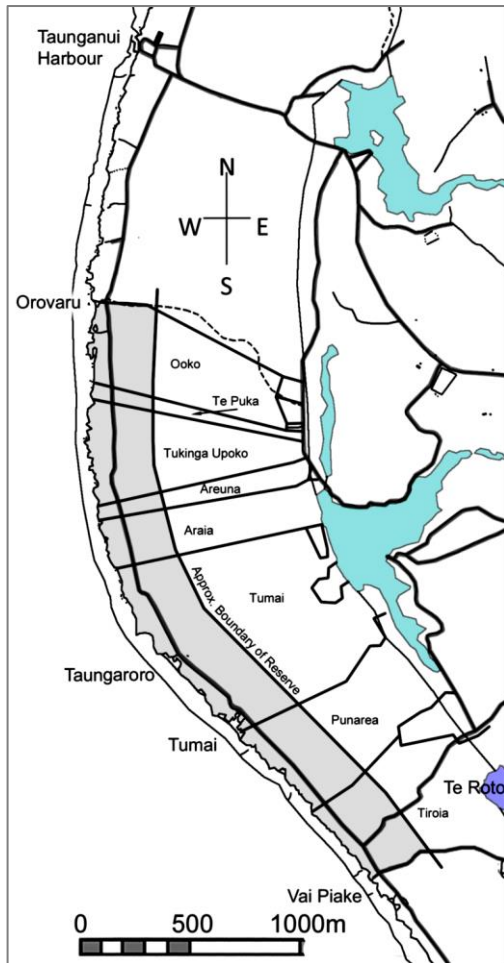
In August 2012, the Prime Minister announced the establishment of a 1.1 million square kilometre multiple-use marine park that would cover half of the Cook Islands exclusive economic zone (EEZ), making the Cook Islands Marine Park (CIMP) the largest in the world at the time. In 2016 this was extended to the whole of the EEZ. An NGO, Te Ipukarea Society (TIS), worked with government agencies and traditional leaders to ensure that communities throughout the Cook Islands were consulted to provide input to how they would like the Marine Park to look. TIS also supported a legal analysis to determine how the Marine Park might be legally designated in accordance with existing legislation. Management of this project was subsequently transferred to the Marae Moana Establishment Trust, and after the Marae Moana Bill passed through Parliament is now under the Office of the Prime Minister

Moko'ero Nui Nature Reserve

The Moko'ero Nui Nature Reserve on Atiu (Figure 5) is the first nature reserve agreed to in the outer islands. It was created in 2016 with a declaration signed by representatives of the landowner families, as part of a project funded by the Critical Ecosystem Partnership Fund delivered by Cook Islands Natural Heritage Trust. It



Road through the Moko'ero Nui Nature reserve
(SOURCE: www.atiu.info/gallery)



celebrates and conserves a major portion of the leeward coastal forest of Ātiu, which is one of the most pristine coastal forests in tropical Polynesia.

The outer forest near the cliff is dominated by *Pisonia* (*Pukatea*), *Pandanus* (*'Ara Tai*) with some *Guettarda* (*'Ano*) and *Ironwood* (*Toa*). The central leeward forest, on both sides of the road, is dominated by massive trees of *Barringtonia*/Fish-poison Tree (*'Utu*) and *Lantern Tree* (*Puka Tavovo*).

Bird life in the forest is mainly Chattering Kingfishers (Ngotare) and Pacific Pigeons (Rupe), with the occasional Pacific Reef-heron (Kotuku) hunting for skinks and insects along the side of the road.

Figure 5: Map of Reserve (grey shaded area)

Cook Islands Shark Sanctuary

The Pacific Islands Conservation Initiative ran an 18-month advocacy, awareness and education project on sharks, coordinated consultations on all the islands, and developed draft regulations that led to the development of this sanctuary.

The Government declared Cook Islands waters a shark sanctuary in December 2012 with all shark and ray species protected from commercial fishing with a ban on the possession, sale or trade of their products. The sanctuary was established by regulations under the Marine Resources Act (2005). The waters of the Cook Islands are home to over 18 species of sharks, 15 of which are threatened or endangered. The most pressure comes from by-catch from the pelagic fishing fleet targeting tuna for foreign markets.

Cook Islands Whale Sanctuary

In 2015 the Ministry of Marine Resources began a public consultation process to discuss a draft policy for this Whale Sanctuary that was declared in 2001. Regulations are to be developed from this policy under the Marine Resources Act 2005. There are 26 known species of whales that live in and migrate through Cook Islands waters, the most widely recognised being the humpback whales that arrive to breed and calve during winter (July to October). The regulations will provide a clear understanding of permissible and prohibited behaviours watercraft operators, aircraft operators, fishermen and others which may come into contact with whales.

1.3 Threats to biodiversity

1.3.1 Invasive species

The Cook Islands is close to the completion of a National Invasive Species Strategy and Action Plan (NISSAP) which identifies the threats posed by invasive species already in the country on native biodiversity, health and economic development (Government of Cook Islands, 2017b). There are further serious pests in countries with which the Cook Islands has air or sea links that need to be kept out by ongoing, rigorous border control. An Early Detection and Rapid Response (EDRR) Plan has also been drafted that details surveillance measures to detect the early arrival of such new pests and response procedures aimed at preventing them become established. An EDRR exercise was conducted to test procedures in 2016, simulating the arrival of brown tree snakes (*Boiga irregularis*) at the port on Rarotonga.

Three tables from the NISSAP are reproduced below. The first illustrates threats to endemic biodiversity (Table 10) and the second lists new pests that have arrived across the border since 2000, mostly with real or potential impacts on agriculture (Table 11). The third lists the priority invasive species identified in the NISSAP for management (Table 12).

Table 10: Cook Islands threatened endemic birds and lizards and the key threats to them.

Species	IUCN Red List Category	Location	Invasive Species Threats
Cook Islands Reed-warbler (<i>Acrocephalus kerearako</i>)	Near threatened	Mangaia, Mitiaro	Cats, Pacific and ship rats (predation); goats (habitat modification)
Rarotonga starling (<i>Aplonis cinerascens</i>)	Vulnerable	Rarotonga	Common myna (competition, disturbance); ship rats (predation); introduced diseases
Atiu Swiftlet (<i>Collocalia sawtelli</i>)	Vulnerable	Atiu	Land crabs (predation)
Rarotonga Monarch (<i>Pomarea dimidiata</i>)	Vulnerable	Rarotonga, Atiu	Cats, and ship rats (predation); weeds (habitat modification)
Cook Islands Fruit-dove (<i>Ptilinopus rarotongensis</i>)	Vulnerable	Rarotonga, Atiu	Common myna (competition, disturbance?); potentially Pacific, Norway and ship rats (predation?); introduced diseases
Mangaia Kingfisher (<i>Todiramphus ruficollaris</i>)	Vulnerable	Mangaia	Common myna (competition, disturbance); cats, (predation); goats (habitat modification)
Cook Islands skink (<i>Emoia tuitarere</i>)	Vulnerable	Rarotonga	Cats, and potentially Pacific, Norway and ship rats (predation)

Note: The arrival of ship rats on islands where they are currently absent, e.g. Atiu, is identified as a very significant invasive species threat. (SOURCE: modified from ISSG (2014) and Gerald McCormack pers. comm.).

Table 11: New pest occurrences for the Cook Islands since October 2000.

No.	Date discovered Month/Year	Common name Scientific name Origin	Host(s)- Damage	Action taken & Current status
1	Oct. 2000	Coconut flat moth <i>Agonoxena argaula</i> Ex Fiji?	Coconut palms & ornamental palms- Caterpillars feed on leaves causing severe damage	Introduction and breeding of the parasitic wasp (<i>Bracon sp.</i>) from Fiji successful
2	Oct. 2000	Orchid weevil <i>Orchidophilus aterrimus</i> Ex Fiji?	Orchids- Weevil larvae and adults feed on orchid flowers, stems, leaves and exposed roots	Attempted of eradication failed. Pest reported to be present at different locations a few years later
3	Nov. 2001	Queensland fruit fly <i>Bactrocera tryoni</i> Ex Tahiti?	Larvae feed on over 100 species of edible and wild fruits and fleshy vegetables	Detection in surveillance trap: Attempted eradication: Intensive trapping, destruction of fallen fruits, distribution of Bactromat pheromone baits, protein bait spraying. Traps sent to Pa Enea, not present on these islands. Eradication on Rarotonga successful due to early detection.
4	Dec. 2003	Hibiscus flower beetle <i>Aethina concolor</i>	Adult beetles lay eggs into flower buds which causes them to drop	Pest widespread. Eradication not feasible. Remains a major pest. Control with systemic insecticides.
5	April 2004	Papaya ring spot virus <i>PRSV-P</i> Mutation of PRSV-W of intercropped cucurbits	Yellowing and distortion of leaves, dark green target like ring spots and C-shaped markings on fruits	Attempted of eradication: Plant destroyed by incineration, systemic herbicide poured into remaining plant stump, area sprayed with insecticide to kill possible insect vectors, monitoring programme and two island wide virus surveys. No further find. Eradication successful.
6	April 2005	Wax moth Not further identified	Caterpillars feed on bee hives	Pest not considered to be serious by beekeeper. No further action taken
7	July 2006	False armoured scale <i>Conchaspis angraeci</i>	On stems of papaya- mainly found on abundant plots with mature trees all over the island	Beneficial ladybird beetles (<i>Chilocorus circumdatus</i>) were found feeding and breeding amongst the pest. No further action taken.
8	Nov. 2006	False oleander scale <i>Pseudaulacapsis cockerelli</i> Ex Australia	On leaves and stems of imported crafted mangos from Australia planted in Matavera and Titikaveka	Attempted of eradication: Trees pulled and destroyed by incineration, area sprayed with insecticide, monitoring programme. No further find. Eradication successful.
9	March 2007	Glassy-winged sharpshooter <i>Homalodisca vitripennis</i> Ex Tahiti?	Many plants, with preference to citrus and gardenias Severe sap feeder;	Trapping monitoring programme, attempted of eradication with insecticides not successful, bio-agent from Tahiti was successful

10	Dec. 2007	Red-banded mango caterpillar <i>Dennolis sublinbalis (new)</i> <i>Noorda albizonalis (old)</i>	Caterpillars bore in mango fruit and seeds	Pheromone trapping not very effective, Population fluctuates from season to season
11	July 2008	Greenhouse thrips <i>Heliethrips haemorrhoidalis</i>	Avocado	Tree and surrounding area sprayed with Imidacloprid, no further find, eradicated?
12	Aug. 2009	Black twig borer <i>Xylosandrus compactus</i> Ex New Zealand	Avocado Beetle borrows in fresh stems of crafted plants	On imported grafted seedlings from NZ, plants re-dipped in insecticides and monitored. Beetle reported to be present and a nursery pest in 2012
13	Nov. 2009	Banana-shaped scale Slender soft scale <i>Prococcus acutissimus</i>	Severe infestation on lychee leaves causing sooty mould. On sago palm (Aug. 2010)	Widespread. Natural enemies present
14	Nov. 2009	Cuban laurel thrips <i>Gynaicothrips ficorum</i>	Severe damage on young leaves, particularly <i>Ficus benjamina</i> ; swarming, nuisance for people, attracted to bright colours, bites, painful when caught in eye	Bio-agent introduced from Hawaii in Dec 2010
15	Nov. 2009	Red-banded thrips <i>Selenothrips rubrocinctus</i>	Guava, Avocado, Terminalia, Copperleaf Severe damage, causing browning-silvering of leaves and fruits	Natural enemies present. Still severe damage observed in 2012
16	Nov. 2009	Trilobite scale <i>Pseudaonidia trilobitiformis</i>	Desert rose Severe damage on leaves, Stunted growth without flowers	Wide spread. Remains major pest despite natural enemies present
17	Aug. 2011	Caterpillar <i>Not further identified</i>	Caterpillar bores into star apple fruit	Rearing of caterpillars to adult stage for easier ID failed, Setting up of yellow sticky traps, monitoring
18	Nov. 2012	Caterpillar <i>Not further identified</i>	Caterpillar bores into strawberry fruit	Rearing of caterpillars to adult stage for easier ID failed, Setting up of yellow sticky traps, monitoring
19	May 2013	Oriental Fruitfly <i>Bactrocera Dorsalis</i>	Host on 170 fruits and vegetables.	Detected in surveillance traps. Eradication initiated with intensive trapping, destruction of fallen fruits, distribution of Bactromat pheromone baits, protein bait spraying. Traps sent to Pa Enea and were present on Aitutaki. Eradication successful on Rarotonga and Aitutaki.

(SOURCE: Maja Poeschko, Ministry of Agriculture, Cook Islands)

Table 12: Priority invasive species of Cook Islands.

Species		Comments	Source
Mammals	Ship Rat <i>Rattus rattus</i>	Widespread threat to birds, invertebrates and food crops. <i>Kakerori</i> survival on Rarotonga dependent on rat control. Need to prevent it reaching Atiu.	2
	Pacific Rat <i>Rattus exulans</i>	A particular threat to ground-nesting seabirds on the northern atolls, hence its recent eradication from Suvarrow	
	Feral pigs <i>Sus scrofa</i>	A threat to food crop plantations and gardens, particularly on Atiu, Ma'uke, Mitiaro and Takutea. Also a predator of coconut crabs and turtle eggs on some islands.	2
	Feral cats	Likely to threaten survival or establishment of burrow-nesting seabird colonies on Rarotonga and Atiu.	
	Feral goats	A particular problem on Atiu where they have removed most of forest understorey and reduced medicinal plants and grass diversity. (Mostly not feral as such, but owned and left to wander).	
Birds	Indian myna	Subject to an eradication programme on Atiu. Not currently recommended for control/eradication on other islands where it is established. Detect early and eradicate if arrives on a new island.	
	Jungle myna	Recently arrived on Rarotonga and not anticipated that it will cause problems but should be monitored. Detect early and eradicate if arrives on a new island.	
Plants	Mile-a-minute <i>Mikania micrantha</i>	Identified as a pest interfering with agriculture and native forest areas on Rarotonga. Also found on Aitutaki, Mitiaro, Atiu, Mauke. Biocontrol programme in early stages.	1,2,3,4
	Lantana – <i>Lantana camara</i>	Serious pest on Atiu due to its prickles and poisonous foliage. Subject to ongoing biological control.	1,2
	<i>Mimosa invisa</i> Giant sensitive weed	Found only on Aitutaki where a psyllid was introduced for biological control with initial success. Subject to ongoing biological control, but needs programme to remove new plants emerging from seed bank.	1,2
	Pikikaa - <i>Mimosa pudica</i> Sensitive weed	Identified as a problem by communities on Mitiaro where it occupies four small areas. Spraying with herbicide is recommended.	1
	Grand balloon vine <i>Cardiospermum grandiflorum</i>	Overgrowing native plants on Rarotonga. Bring into current biocontrol programme as scheduled.	1,2,4
	Java plum <i>Syzygium cumini</i>	Invasive on Atiu and Mauke where it was introduced as a wind-break	1,2

	Cocklebur <i>Xanthium pungens</i>	Maintain community control programme. Bring into current biocontrol programme as scheduled.	3,4
	<i>Merremia peltata</i>	Present on Rarotonga, Atiu, Mitiaro and Aitutaki. Bring into current biocontrol programme as scheduled.	2,3,4
	<i>Merremia</i> spp (4 species including <i>M. tuberosa</i> Wood Rose)	Survey and monitor spread.	2
	<i>Acacia mangium</i> & <i>A. auriculiformis</i>	Survey and map distribution. Assess threat to native ecosystems and farming and investigate options to use the timber and plant natives for land stability.	2
	Red passionfruit <i>Passiflora rubra</i>	Subject to control programme on Mauke. Bring into current biocontrol project as scheduled.	3,4
	African tulip tree - <i>Spathodea campanulata</i>	Bring into current biocontrol programme as scheduled.	3,4
	Strawberry guava <i>Psidium cattleianum</i>	Bring into current biocontrol programme as scheduled.	3,4
	Dodder <i>Cuscuta</i> sp.	Present on Rarotonga and subject to research on control methods	
	White ginger <i>Hedychium coronarium</i>	Infestation on top of Te Kou mountain. Review threat to other mountain areas.	3
	Para grass <i>Urochloa mutica</i>	Agriculture pest on Rarotonga – arrived Tuapapa with tomato stock	
Invertebrates	Fruit flies – <i>Bactrocera</i> spp.	Ongoing surveillance for new incursions – particularly Oriental and Queensland fruit flies. Ongoing control by growers of species present.	2
	Glassy-winged sharpshooter <i>Homalodisca coagulata</i>	Subject to ongoing biocontrol on Rarotonga. Awareness to detect & eradicate if arrives on other islands.	
	Cuban laurel thrip <i>Gynaikothrips ficorum</i>	Maintain monitoring of biocontrol programme.	
	No-see-'em biting-midge (sand flies) – <i>Culicoides belkini</i>	Continue research on Aitutaki aimed at minimising impact, including testing repellents. Apply lessons learned on Mitiaro also.	2
	White-fly [spp]	Continue research and investigate biocontrol. Pesticide resistance developing.	
	Leaf miner [spp]	Investigate whether earlier biocontrol agent is still present.	
	Tropical fire ant (<i>Solenopsis germinate</i>)	Survey to assess distribution and impact (on people and on crops through encouraging mealy bugs which increase sooty mould); investigate opportunities to control.	

	Yellow crazy ant (<i>Anoplolepis gracilipes</i>)	Survey to assess distribution and impacts on Rarotonga. Assess need and options for control.	
	Disease-carrying (e.g. dengue fever) mosquitoes – e.g. <i>Aedes aegypti</i>	Ongoing programme of Health or periodic inspections and control to reduce numbers.	
	Pest and disease threats to honey bees	Investigate if problems of reduced pollination due to reduce honeybee numbers are confirmed by growers.	
Marine organisms	Crown of thorns starfish - <i>Acanthaster planci</i>	This native species periodically has outbreaks when its numbers build up enough to damage coral reefs.	1

SOURCES:

1. 4th National report to CBD - identified as 'most serious' invasive species by communities during NBSAP consultations. Comments from NES (2004).
2. 2004 5-island survey of Anau Matarangi (NES 2004)
3. Top 15 weeds as candidates for biocontrol (2009 biocontrol workshop by Landcare Research)
4. Top 8 weeds chosen for biocontrol (2009 biocontrol workshop by Landcare Research)

1.3.2 Overharvesting

A survey of '*unga* (coconut crabs) on Mauke showed clear evidence that this population was being over-harvested and measures are being put in place to address the problem (Matamaki et al., 2016). This is the first such survey undertaken in the country and a similar situation is thought to exist on other islands.

A survey of turtles on Mauke identified some harvesting: killing of adults and taking of eggs (Bradshaw & Bradshaw 2012), though whether this is at an unsustainable level is unclear.

The latest assessment of the commercial tuna fishery within the Western and Central Pacific as a whole identifies that skipjack, yellowfin and albacore tuna are not over-fished, but bigeye tuna are. The by-catch of large sharks from the long-line fishery is a regional concern.

Sea cucumber surveys carried out across four islands identified that densities of lollyfish and surf redfish were above 'regional healthy densities', however greenfish were below this level and absent from one island (Raumea et al. 2013). The greenfish however is not a species used by Cook Islanders so fishing pressure is not the cause. Past commercial exploitation of red surf fish was halted due to inadequate resource management leading to over-fishing. Lollyfish could support low to medium exploitation.

1.3.3 Habitat loss and deterioration

There continues to be some loss of native forest on Rarotonga from a shift of housing into mountain areas following increased tourism developments along the coast but relatively small areas are affected. However this is not readily quantified and is of limited impact in terms of habitat loss, however encroachment upwards into forested hills potentially paves the way for invasive species

invasions, and erosion and sedimentation from development can impact far beyond the actual development site.

Monitoring of water quality in freshwater streams on Rarotonga and Aitutaki shows this to be poor with resulting impact on the lagoon through enhanced bacteria and nutrient levels. Periodic increases in marine algae, likely due in part to this run-off impact negatively on the tourism experience.

1.3.4 Climate Change

Climate change risks identified for the Cook Islands include the following (Government of Cook Islands 2012):

- Warming temperatures
- Sea level rise
- Increased intensity of cyclonic activity
- Changing precipitation patterns
- Ocean acidification
- Coral bleaching
- Shifting fish stocks
- Accelerated coastal erosion
- Loss of agricultural productivity
- Health issues (particularly increased incidence of vector-borne diseases)
- Quality and quantity of freshwater resources.

Several of these impact directly on native biodiversity as set out below.

The climate of the Cook Islands is strongly affected by the South Pacific Convergence Zone (SPCZ) which is variable in its location, and in turn influenced by El Nino and La Nina events. In El Nino years there is above average rainfall in the Northern Cook Islands and drier conditions in the Southern and this is reversed in La Nina years. Detecting any impacts resulting from human-induced climate change is difficult against a background of these significant fluctuations, but some evidence is emerging.

Warming temperatures

By 2030, under a high global carbon emission scenario, temperatures are predicted to increase between 0.5 and 0.9°C in the Southern Group and 0.4 and 1.0°C in the Northern Group. Such changes could move temperatures beyond the range tolerated by some native species and being restricted to islands they don't have the opportunity to shift further from the equator or to higher altitudes to compensate. The new temperature norms may prove beneficial for some invasive species originating from warmer areas leading to new species becoming established and others increasing in impact. As an example, the possible spread of malaria and the mosquitoes that carry this disease to the Cook Islands is a significant concern.

Warming trends are evident in the Cook Islands and data from Rarotonga show an increase in the annual number of 'warm' nights and decrease in the number of 'cold' nights from 1934-2011 (PACCSAP 2014). No such trends were recorded at Penrhyn in the Northern Group from 1941-1991. There is *very high* confidence that temperatures will continue to rise in the Country (op. cit.).

Sea level rise

Sea levels are projected to rise between 5 and 15cm by 2030 (relative to the period 1980-1999) and between 19-58cm in a worst case (high emissions) scenario by 2090. There are indications that levels in the Pacific have risen an average of 1.6mm/year over the past 50 years (Government of Cook Islands 2012).

Rising sea levels will impact on the vegetation and species living in the coastal zone and are a particular threat to low-lying atolls. Periods of extreme wave activity and storm surges can destroy native habitats and the sites used by ground-nesting birds – e.g. sooty terns. Resulting increased salinity can lead to conditions that are unsuitable for native plants. No suitable dataset is available to assess long-term historical trends in the Cook Islands wave climate (PACCSAP 2014) and whether extreme wave events are increasing.



Sooty terns nesting on ground, Suvarrow Atoll (SOURCE: Adam Kerner).

Increased intensity of cyclonic activity

Tropical cyclones are a regular natural occurrence in the Cook Islands. Since 1970 when satellite monitoring began, there has been an average of 1.8 cyclones per season, with the Southern Cooks hit more than twice as frequently as the Northern Cooks and the island of Palmerston having the greatest number (Scally 2008). Since 1891, cyclones with moderate and major human impacts have occurred on average at least every 3.8 and 8.8 years, respectively. Since 1970, 56% of cyclones have occurred during El Niño events. The worst season in recent years was 2005 when five cyclones hit the Country. Available data are not considered suitable for assessing long-term trends (PACCSAP 2014) and detecting any increased activity.

In the period since 2011 (submission of 4th National Report) the country has been impacted by a few cyclones. In January 2013 Cyclone Garry (Category 3) brought damaging gale force winds (estimated average 148kph with gusts to 203kph), heavy rain and high sea swells to the northern islands. In March 2014 Cyclone Mike (category 1) had minor impact bringing high winds to the southern group. In January 2016 Cyclone Victor (Category 3) carrying winds of 150 km/h had significant impact on Palmerston where there were dramatic swells that inundated the north end of the island causing people to be evacuated and very heavy rain causing surface flooding inland. Coconut trees were lost

and there was some minor damage to buildings. In February this year Cyclone Yalo (Category 1) developed well to the northeast of Mauke Island and moved towards French Polynesia causing minimal impact in the Cook Islands.

Changing precipitation patterns

Annual and half-year rainfall trends show little change at Rarotonga since 1899 and Penrhyn since 1937. There has also been little change in extreme daily rainfall at both sites since the mid-1930s (PACCSAP 2014).

Ocean acidification

Acidification impacts of the growth of corals and other organisms such as shellfish that construct their skeletons from carbonate materials which can in turn threaten coral reefs and the goods and services they provide (Government of Cook Islands 2012). Fortunately, CO₂ is less soluble in warmer waters so less of an impact will occur at equatorial latitudes.

Ocean acidification is expressed in terms of aragonite saturation state – aragonite is a form of calcium carbonate used by hard reef-building corals to build skeletons so it can be treated as a proxy measure for coral reef growth rate. In the Cook Islands, the aragonite saturation state has declined from about 4.5 in the late 18th century to an observed value of about 4.1 ± 0.2 in 2000 and there is *very high confidence* that it will continue to decrease as atmospheric CO₂ concentrations increase (PACCSAP 2014). The impacts of ocean acidification are also likely to affect the entire marine ecosystem, affecting the key ecosystem services provided by reefs.

Coral bleaching

NOAA predicted in July 2015 that the third-ever global bleaching event could cause a 6% global reduction in coral reefs in less than two years. In the Cook Islands the 2015/16 El Niño event was the strongest recorded since the 1982/83 and 1997/98 events, bringing unusually warm water to the equatorial Pacific. From November 2015 to June 2016, much of the northern Cook Islands were experiencing ocean temperatures well above 30°C. The impacts of this event were examined on Penrhyn, Rakahanga, Manihiki, and Pukapuka in the Northern Cook Group in July 2016 where bleaching decimated over 60% of corals (Rongo 2016). Much of the bleaching was noted on fore reef habitats followed by deeper lagoon habitats, while shallow reef flat habitats appeared the least affected. There is *very high confidence* that the risk of coral bleaching is expected to increase in the future (PACCSAP 2014).

Shifting fish stocks

Changes in sea temperature may alter the distributions of semi-migratory fish species such as tuna, with consequences for the Cook Islands fishery, but data to support this is not available.

Chapter 2: National Biodiversity Strategy & Action Plan (NBSAP), its implementation and mainstreaming of biodiversity.

The Cook Islands produced its first NBSAP in 2002 with actions grouped under eight themes:

- A. Endangered species management
- B. Invasive species management
- C. Ecosystem management
- D. Equitable sharing of benefits and access to biodiversity
- E. Management of knowledge related to biodiversity
- F. Biodiversity awareness and education
- G. Mainstreaming of biodiversity
- H. Financial resources and mechanisms for biodiversity

The 4th National Report to the CBD identified that implementation was slow in the beginning and a lack of resources and the absence of a Biodiversity Division to coordinate the work were two reasons given. A range of surveys had provided information for different groups to input into the Cook Island Biodiversity Database, and a more significant range of studies were carried out in 2004 and 2005 under 'NBSAP Add-On' Project funded through GEF/UNDP.

Progress against each action up to 2010 was tabulated in the 4th National Report and a similar approach has been adopted here for the period 2011-2016.

It will be noted that only a small number of actions have been identified as completed. This is largely a result of how the NBSAP action plan was formulated, primarily as an agreed output from a national workshop at the end of the development process. Many of the actions took a form such as

- 'Establish a programme to...' (as in A1a),
- 'Establish an agency to ...',
- 'Establish a working group...', and
- 'Establish a Trust Fund to...'.

These specific next steps generally never happened. However valuable work has been undertaken to make some progress on each theme, typically led by the different agencies within their key responsibilities, and through externally-funded projects supporting them.

The revised NBSAP under development will be more prescriptive in its actions.

Theme A: Endangered Species Management

Linked to Aichi Targets 12 and 13.

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
A1a Survey & conserve endemic and other endangered flowering plants	<ul style="list-style-type: none"> Survey of cloud forests on Rarotonga, home to several invasive plants (Wildlands 2016). 	No	Yes	
A1b Extend flowering plant programme to include other types of plants that are endemic, native or endangered	<ul style="list-style-type: none"> Study of dispersal of fig seeds in the Cook Islands (Staddon et al 2010) 	No	Yes	
A1c Survey/conserve rarer plants used in herbal medicine	<ul style="list-style-type: none"> Conservation of rare <i>Vairakau maori</i> (traditional medicine) plants Baseline surveys of <i>Vairakau maori</i> on Mauke and Atiu 	No	Yes	
A1d Survey & conserve endemic animals and rare native animals	<ul style="list-style-type: none"> <i>Kakerori</i> (Rarotonga monarch) conservation work in Takitumu CA (annual) (various reports) Survey of myna and Rimatara lorikeet on Atiu (Heptonstall 2010) Population survey of <i>tangaao</i> (kingfisher) on Mangaia Seabird surveys on Suwarrow Survey of the <i>l'oi</i> (starling) on Rarotonga (Easby & Compton 2013) Study of coastal landsnail fauna of Rarotonga (Brook 2010) Assessment of coconut crab in Mauke (Matamaki et al. 2016) Surveys within Cook Islands Turtle Project (PICI 2014, 2015) Establishment of Cook Islands Shark Sanctuary in 2012 with all shark and ray species protected. 	No	Yes	
A1e Survey & conserve marine animals harvested for food or conservation gain	<ul style="list-style-type: none"> Survey of sea cucumber resources of several islands (SPC 2013) Status of invertebrate resources at Manihiki & Rakahanga atolls (George & Story 2014) Status of invertebrate resources at Pukapuka atoll (George & al. 2014) 	No	Yes, ongoing	

	<ul style="list-style-type: none"> • Status of invertebrate resources in Mauke and Mitiaro (George & Kea 2014a) • Baseline assessment of invertebrates and benthic coverage at Kavera Ra'ui, Rarotonga (George & Kea 2014b) • Survey of marine resources of Penrhyn • Invertebrates and finfish assessment in the Ra'ui of Rarotonga (George et al. 2013) • Rarotonga fore reef community survey for 2014 (Rongo et al 2015) • Cetacean research by Whale Research Centre 			
A2a Survey & conserve rarer varieties of taro, coconuts and other traditional agro-varieties & agro-species	<ul style="list-style-type: none"> • Ongoing regional work on coconut conservation through Asia Pacific Coconut Community (APCC) • Cook Island taro varieties held by SPC in Fiji • Programme to conserve specific agricultural trees through grafting and raising in nursery 	Ongoing	Yes, ongoing	
A2b Survey & conserve the rarer animals of agriculture and home		No	Unsure	

Theme B: Invasive Species Management

Linked to Aichi Target 9.

A key overarching achievement in relation to this theme has been the drafting in 2016/17 of a Cook Islands National Invasive Species Strategy and Action Plan (NISSAP) with a comprehensive review of issues and programmes and a plan of action developed for 2017-2021.

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
a) Survey on all islands invasive species in natural and agro-ecosystems		No	Yes – on islands not yet surveyed	

<p>b) Develop community-based programme to eradicate those invasive weeds & animal pests not yet widespread on particular islands</p>	<ul style="list-style-type: none"> • Programme to eradicate red passion fruit on Mauke (Munro & Kaokao 2015) • Programme to control beach burr on Pukapuka (Munro et al. 2015) • Programmes to control <i>Mimosa</i> spp. on several islands • Programmes to control <i>Cuscutta</i> on Rarotonga <p>Other eradication programmes:</p> <ul style="list-style-type: none"> • Eradication of rats from Suvarrow Atoll completed • Programme to eradicate Indian myna from Atiu close to completion • Incursion responses to successfully eradicate fruit flies 	<p>No</p>	<p>Other localised species to be targeted</p>	
<p>c) Assist with the control of more serious invasive weeds & animal pests in natural and man-modified ecosystems</p>	<ul style="list-style-type: none"> • Ongoing control of rats at Takitumu, Rarotonga to benefit <i>kakerori</i> (Rarotonga monarch) • Programme to introduce biocontrol for priority weed species • Biocontrol of agricultural pests: coconut scale, Cuban laurel thrip • Study of control of no-see-'em biting midge (<i>Culicoides</i> sp) • BirdLife launches invasive species video - Saving Suvarrow's Seabirds - July 2013 	<p>Ongoing – major work achieved</p>	<p>Yes – still further species to address and programmes to complete</p>	
<p>d) Review control of transboundary and inter-island movement of terrestrial and marine plants and animals and LMOs/GMO's</p>	<ul style="list-style-type: none"> • Development of National Biosafety Framework (2008) including legislative review • Suvarrow Islands Biosecurity Plan • Ongoing work reviewing biosecurity procedures • Development of National Invasive Species Strategy & Action Plan (2015-16) 	<p>Ongoing</p>	<p>Yes – always a need to undertake review particularly of invasives</p>	

Theme C: Ecosystem Management

Linked to Aichi Targets 5,7,11

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
a) Establish Suvarrow National Park Authority	<ul style="list-style-type: none"> Suvarrow National Park Regulations drafted, including the establishment of the Authority under the regulations. 	No		
b) Select areas to establish a national system of community-based protected areas to protect important terrestrial ecosystems	<ul style="list-style-type: none"> Priority Sites for Conservation in the Cook Islands: Key Biodiversity Areas and Important Bird Areas have been identified Catchment management and restoration plan for Rarotonga cloud forests (Wildlands 2016) 	No	Yes	
c) Select areas to establish a national system of community-based protected areas to protect important reef and lagoon ecosystems	Marine Conservation Area activities – not directly linked to this action in reefs and lagoons <ul style="list-style-type: none"> Declaration of 1.1 million km² multiple-use Cook Islands Marine Park in 2012, increased to 1.9 million in 2016 	No	Yes	
	Ecosystem Conservation activities – not directly linked to actions <ul style="list-style-type: none"> Management of freshwater lakes on Mitiaro (island community) 			

Theme D: Equitable sharing of benefits and access to biodiversity

Linked to Aichi Target 16

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
Establish an independent agency to encourage and manage	No agency has been established.	No	Yes	

research on biodiversity & its uses, and to ensure equitable sharing of benefits	Intellectual property (IP) legislation is proposed by the Ministry of Culture, together with the possible establishment of an IP Office. A major project ' <i>Strengthening the Implementation of the Nagoya Protocol on Access to Genetic Resources and Benefit Sharing in the Cook Islands</i> ' has been initiated in 2016 with support from UNDP/GEF.			
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Theme E: Management of knowledge related to biodiversity

Linked to Aichi Target 18

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
a) Establish body to review access to and processing of knowledge on biodiversity and its use, especially medicinal	A Traditional Knowledge (TK) Act was passed in 2013 which makes provision for the registration of TK and creates a TK Advisory Committee. Regulations and processes are to be developed under this.	In part.	Yes.	
b) Continue programme of Natural Heritage Project to record all Cook Islands biodiversity and make this information available to general public	Work on the database continues.	No - ongoing	Yes	

Theme F: Biodiversity Awareness & Education

Linked to Aichi Target 1

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
a) Establish working group to investigate ways to ensure that knowledge of biodiversity and its use is available to students & public		No	Yes – a working group is being formed to develop actions for the new NBSAP	
b) Encourage NGO's to include knowledge of biodiversity where relevant	Not clear that anyone took responsibility for this action, but Te Ipukarea Society actively implement biodiversity projects and education awareness activities and several other NGO's as well as PICI and others.	No		Yes
	<p>Activities related to biodiversity education that took place but not within the two actions listed :</p> <ul style="list-style-type: none"> • Thematic approach applied in Primary Schools includes several biodiversity-related themes such as the 'Living World' which includes Cook Is. species and ecosystems • High school education based on NZ Curriculum for NZCA so overseas examples utilised • IIB Project and Live and Learn undertook training of teachers programme for biodiversity conservation. This training has seen an increase in the number of biodiversity related activities carried out in schools. • The theme of Island Biodiversity was celebrated in 2014 and 2015 with the production of a number of education and awareness materials e.g. posters, banners, resources for teachers, newspaper advertorials etc. as well as teaching events and activities e.g. Lagoon 			

	<p>Day, Environment week, Cross Island nature walk, Miss Cook Islands pageant Environment section.</p> <ul style="list-style-type: none"> • Education and awareness programmes of Government agencies: National Environment Service, Ministry of Agriculture, Ministry of Marine Resources, Marae Moana; and NGO's including Te Ipukarea Society (TIS), for example: <ul style="list-style-type: none"> ○ Production of Suwarrow and Mauke Island Memories documentaries recording traditional knowledge (TIS) ○ Publication of Baby K's Secret Valley – a children's book about the Rarotonga Flycatcher (TIS) 			
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Theme G: Mainstreaming of biodiversity

Linked to Aichi Target 2

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
Establish working group to review policies & activities of Govt. ministries & agencies to ensure consistency with maintenance of Cook Islands biodiversity & related knowledge	<p>No group was established.</p> <p>There is a national Biodiversity Steering Committee that oversees biodiversity projects for NES and also serves as the mechanism for developing and approving biodiversity priorities and for inter-organisation sharing of activities/events/information.</p> <p>Mainstreaming of biodiversity conservation is evident, particularly in the Country's national planning document: Te Kaveinga Nui – National Sustainable Development Plan which has 'Ecological Sustainability' as a priority area.</p>	No		

Theme H: Financial Resources & Mechanisms for Biodiversity

Linked to Aichi Target 20

Themes & Actions	Activities undertaken in relation to action	Action completed	Further work needed, still a priority	No longer a priority
Establish Biodiversity Trust Fund to support wide range of activities required to conserve Cook Islands biodiversity	None	No	For assessment during 'Financing' consultancy as part of revised NBSAP development	

Chapter 3: Progress towards 2015 and 2020 Aichi Biodiversity Targets and contributions to 2015 Targets of the Millennium Development Goals.

3.1 2015 & 2020 Aichi Biodiversity Targets

The CBD's Strategic Plan for Biodiversity 2011-2020 includes 20 headline targets for 2015 or 2020 (the "Aichi Biodiversity Targets"), organized under five strategic goals. The goals and targets comprise both: (i) aspirations for achievement at the global level; and (ii) a flexible framework for the establishment of national or regional targets. Progress towards each target is summarised below.

Strategic goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Community awareness programmes are ongoing.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

The Country's national planning document: Te Kaveinga Nui – National Sustainable Development Plan has 'Ecological Sustainability' as a priority area which includes biodiversity conservation. A mainstreaming strategy is to be developed as part of the revised NBSAP to take this further into policies and agency planning.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

No such negative subsidies are in place. The possible development of positive incentives will be included in a financing strategy to be developed within the revised NBSAP.

Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Agriculture is largely aimed at food production for the local market rather than export so it is considered to be taking place at a sustainable level with minimal impact on natural resources. Issues relating to the marine environment are addressed under Target 6 below.

Strategic goal B. Reduce the direct pressures on biodiversity and promote sustainable use

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

There is currently limited loss of forest habitats though degradation through the impacts of invasive species – smothering weeds on several islands and feral goats on the makatea islands. A comprehensive biocontrol programme is tackling some of the worst weeds and local communities are investigating the means to manage feral goats – and feral pigs. Some loss of small wetlands continues on Rarotonga and this is being addressed through awareness programmes and the strict approvals process of Rarotonga Environment Authority

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

The Government has recently developed an Offshore Fisheries Policy which has sustainability as a key objective. The Cook Islands Exclusive Economic Zone (EEZ) South Pacific albacore longline fishery has become the first Chinese tuna fleet to be certified to the Marine Stewardship Council (MSC) Fisheries Standard. There is an ongoing debate about the licensing of European purse-seiners to target skipjack tuna and the use of offshore Fish Aggregating Devices, amid concerns that stocks of species such as bigeye and yellowfin tuna which local fishermen rely on may be impacted. The current long-lining fleet catches significant numbers of bigeye tuna which have been identified as over-fished regionally (SPC 2014).

Inshore fisheries are not apparently overfished, particularly due to concerns of Ciguatera in Rarotonga and reduced population levels and numbers of active fishermen in other islands. There have been noticeable changes in some populations but these are considered to be due to decadal climate fluctuations rather than the impacts of harvesting (Rongo & Dyer 2016).

Surveys have identified over-exploitation of reef invertebrates, particularly sea cucumbers on several islands. However there are mechanisms in place to address the situation at some sites including export bans and locally protected areas (ra'ui), and Ministry of Marine Resources are working with communities demonstrating an interest in creating further Ra'ui.

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

At current levels of exploitation this target is probably being achieved. The Ministry of Agriculture Business Plan for 2017/2018 also identifies deliverables pertaining to promoting sustainable farming systems and organic agriculture.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

There have been ongoing concerns over water quality in the Rarotonga lagoon, particularly in the Muri aware, and freshwater streams on this island and Aitutaki are in poor condition. A community

management plan has been developed for the Takuvaine Water Catchment above Avarua though there are issues with its implementation. The Water, Waste and Sanitation Unit of the Ministry of Infrastructure Cook Islands are engaged in a major project to upgrade sewerage and septic systems at Muri.

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

The Cook Islands has recently completed the development of a National Invasive Species Strategy and Action Plan (NISSAP) 2017-2021, and a range of invasive alien species (IAS) management activities within the regional GEF-PAS project: "Prevention, eradication and control of invasive alien species in the Pacific islands" coordinated by SPREP. The NISSAP contains an Action Plan to address current priorities. It reports on successful programmes to eradicate rats and myna birds from different islands, to control pest insects of agriculture through biological control, and to tackle a wide range of weeds through physical and biocontrol methods. The main IAS pathways have been identified and measures proposed to strengthen national and inter-island border control including through the EDRR. Implementing the NISSAP will allow the Cook Islands to largely achieve this target.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

The deadline for this target has passed and the coral reefs in the Cook Islands have been identified in generally good condition. There are limited anthropogenic threats to them and those that exist, such as nutrient run-off on Rarotonga, are being addressed.

Strategic goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target 11: By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Currently only about 1% (4 of 258 km²) of the Country's land area is protected according to the figures of the World Database on Protected Areas www.protectedplanet.net or 2.5% (6.5km²) including more informally protected sites as identified in Table 7 in this report. Targets of 17% (land) and 10% (coastal & marine) are considered largely meaningless for a country like the Cook Islands composed of small islands whose land is almost entirely in relatively small parcels in the communal ownership of individual families which typically extends to a 'Queens Chain' above the mean high water mark. There are few ready mechanism for the Government to create large conservation areas. Instead the approach is to identify and monitor the threats to native habitats and address these with practical programmes (e.g. invasive species control) or awareness programmes.

Regarding inshore marine habitats, there are ra'ui or locally managed marine areas in place on most islands at any one time (Table 7) though these are usually for a defined period of a few years aimed at the recovery of harvested marine resources. Key areas for marine biodiversity have been identified at a broad level (e.g. island-wide) (Table 5). Work is needed to focus down to a more detailed level to

identify important sites within these areas and ensure that these are protected from new threats and that local communities have the information needed to look after them.

The recently legislated Cook Islands Marine Park covers all 1.9 million square kilometres of the country's Exclusive Economic Zone. Within this area 324,000 sq km has a higher level of protection with its purpose "to protect the pelagic, benthic, coral reef, coastal, and lagoon habitats of the marae moana and, accordingly, all seabed minerals activities and large-scale commercial fishing in the area are prohibited, but other ecologically sustainable uses are permitted". This represents a conservation area very well ahead of a 10% target for marine areas. However it is early in its development and legal designation and details for marine spatial plans and management measures for marine-based activities need to be developed under the Act.

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

The Cook Islands is making continuing progress towards the recovery of the Rarotonga Monarch or *Kakerori* as outlined in section 1.2.3 of this report. It is currently classified as 'vulnerable' in the IUCN Red List from being 'critical' in 1998 and 'endangered' in 2008 www.iucnredlist.org.

The Rimitara Lorikeet continues to be ranked in IUCN Red List as 'endangered'. However the apparent successful establishment of a new population of birds on Atiu, and the near-success of the eradication of myna birds on that island, provide an opportunity for a significant increase in both the number of birds and the number of populations. This in turn may see it re-classified to 'vulnerable' in the future.

Table 7 identified five other endemic birds alongside the *kakerori* that are on the IUCN Red List: Cook Islands Reed-warbler ('near threatened'), Rarotonga Starling, Atiu Swiftlet, Cook Islands Fruit-dove, Mangaia Kingfisher (all 'vulnerable') and one endemic lizard Cook Islands skink ('vulnerable'). Of these, there has been a baseline population survey conducted of the starling and a study carried out that suggested that the kingfisher is not under threat from the population of myna birds found on Mangaia. Other threatening factors largely remain in place as identified in Table 7.

Of the turtle species found in the Cook Islands, the green and the hawksbill turtles are both classified as 'endangered'. The survey work currently conducted on these species should provide the basis for management work that could reverse a likely declining trend in the country.

Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Some work to conserve Cook Island varieties of key food crops is ongoing through the Ministry of Agriculture. This includes the Taro Breeding or Taro Improvement Programme to cross breed Taro using selected lines with proven Taro Leaf Blight tolerant characteristics from Samoa with locally proven cultivars. This activity includes other important staple crops – Cassava, Sweet potato, and Yams.

Strategic goal D: Enhance the benefits to all from biodiversity and ecosystem services

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

The high island of Rarotonga has significant forested valleys that provide key services including water and soil retention. One water catchment, Takuvaine, has a community-based Management Plan in place however this is now largely inactive. Water quality is monitored on most major streams on Rarotonga and Aitutaki and it is generally poor with low concentrations of oxygen due possibly to contamination from faecal matter and fertilisers. There has been some work to upgrade sewage systems to meet the revised and improved standards under the Sewage Regulations 2012 and clearly more remains to be done, particularly to ensure that commercial enterprises, including tourism accommodation, are in compliance with these improved standards.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

This target seems of limited relevance to the Cook Islands where there is very little degradation of ecosystems.

Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

While the Cook Islands did not meet this target, in 2016 a project entitled 'Strengthening the Implementation of the Nagoya Protocol on Access to Genetic Resources and Benefit Sharing in the Cook Islands' was initiated with support from GEF/NPIF/UNDP. Its primary objective is to develop and implement a national Access and Benefit Sharing (ABS) regulatory framework, build national capacities and support an ABS Agreement based on Traditional Knowledge and a Public-Private Partnership. Through this project, the Cook Islands aims to meet Target 16 by 2019.

Strategic goal E. Enhance implementation through participatory planning, knowledge management and capacity building

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

An updated NBSAP is being completed in 2017 alongside the preparation of this national report.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

A Traditional Knowledge (TK) Act was passed in 2013 which makes provision for the registration of TK and creates a TK Advisory Committee. Regulations and processes are to be developed by the Ministry of Culture under this.

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

The Government continues to support the Cook Island Natural Heritage Trust to develop the Cook Islands Biodiversity Database www.cookislands.bishopmuseum.org and facilitate the sharing of its information. The scope of the Marae Moana Policy 2016-2020 includes facilitating coordination, research and information sharing in order to sustainably manage and protect the Marae Moana. The policy fosters a culture of investigation and research (policy objective 12) and also prioritises the dissemination of information from research (policy 12.3).

Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Consultants have been recruited to develop a financing strategy as part of the development of the country's revised NBSAP. The Marae Moana Policy 2016-2020 and Marae Moana Act 2017 adopt sustainable financing as a principle that will guide their implementation. It is anticipated that since the scope of the Marae Moana Policy includes activities on land that impact the marine environment, sustainable financing will include financing for both terrestrial and marine biodiversity conservation.

3.2 2015 Targets of the Millennium Development Goals (MDG)

Of the eight MDG, biodiversity-related work is largely of relevance to *Goal 7 - Ensure Environmental Sustainability*. However biosecurity work to prevent the arrival of new mosquitoes and other disease-carrying organisms contributes to *Goal 6 - Combat HIV/AIDS, Malaria and other diseases*, as does work to control mosquitoes already in the country.

Goal 7 has one target (9) that relates to activities in Cook Islands NBSAP and two indicators relevant to biodiversity conservation. Progress against each has been reviewed as follows:

Target 9. Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources	
Indicator & 2015 target	Progress
25. Proportion of land area covered by forest – target: 75%	Approximately 67% of Cook Islands' land is covered by forests, with 62% covered by natural forests (2010 data). There are currently very low rates of forest clearance. The Cook Islands are generally small and there has been limited opportunity to extend areas in forest, as remaining land was largely fully used for agriculture or dwellings and other infrastructure. A decline in agricultural and increase in fallow areas may allow some forest re-growth or re-planting.

26. Ratio of area protected to maintain biological diversity to surface area – target: 25%	Only about 1% of the country’s land area is currently protected. It was identified earlier that targets such as 25% (here) and 17% (Aichi) are unrealistic and impractical for a country of small islands where most land is traditionally owned.
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3.3 Lessons learned from the implementation of the Convention in Cook Islands

The Cook Islands has come a long way since Government signed the Convention on Biological Diversity (CBD) at the Earth Summit in 1992. As a party to the CBD, the Cook Islands Government committed itself and its people to conserve its biodiversity, to use it in a sustainable manner, and to share its benefits in an equitable manner amongst its people. It also committed itself to controlling invasive species, of weeds and pest animals in natural and agricultural ecosystems and to reduce the possibility of future invasions. From this the Cook Islands has experienced some lessons such as;

Poor Coordination and Inter Agency Collaboration.

One of the main lessons learnt was that whilst various stakeholders, agencies and the key legislative drivers all agree and support the conservation and preservation of our environment, through the CBD protocols, matching this with aligned action, monitoring, coordination and the focus of achieving key targets and results, becomes difficult and lacked cohesion. There is also the occurrence of various government agencies carrying out identical or similar projects under the same project aid partners and development agencies. Generally poor correlation between NBSAP’s and sectoral policies as the Aichi targets are not included in some plans. It was noted that processes are more technical than political and do not influence policy beyond the remit of the national agency directly responsible for biodiversity. Many NBSAP’s are overly ambitious and prescriptive and lacked a strategy for financing implementation. The Cook Islands hopes that the formation of the National Biodiversity Steering Committee to oversee the implementation of all biodiversity donor projects as well as to share information on biodiversity related activities being undertaken by the various organisation members, will help to achieve coordination and cohesive approaches to addressing priority biodiversity issues across islands. . In the case of marine biodiversity, coordination and inter-agency collaboration is anticipated to be additionally facilitated through the establishment of a Marae Moana Coordination Office, and the requirement for a Technical Advisory Group to develop marine spatial plans and management measures for marine based activities.

Lack of High Level Participation

One of the major deficiencies identified was the lack of senior level management engagement and involvement in the decision-making process and overall management. The substitute for this was to involve as many stakeholders as possible to ensure the NBSAP is “owned” more widely, although this was not the solution but more an excuse for not prioritising the NBSAP and biodiversity as an important component within the CBD and NSDP plans. The Marae Moana Council, comprising the Prime Minister, Leader of the Opposition, President of the House of Ariki as well as other representatives from various sectors of society, is anticipated to enable high level participation in the management of marine biodiversity.

Better monitoring and evaluation required.

A lot of time, energy and financial resources has been invested in the NBSAP and other biodiversity related projects. However, it was noted, there is a low level of assessment in the efficiency and effectiveness of implementation to verify performance and results against planned outcomes. Established targets and indicators must be linked to the Aichi biodiversity targets for 2011-2020. At present this activity is not implemented. The Central Policy and Planning Office (CPPO) under the Office of the Prime Minister is developing an indicator report to aid the evaluation of progress towards the achievement of the National Sustainable Development Plan 2016-2020 (NSDP). The CPPO have it under their 2017/2018 business plan to evaluate several biodiversity indicators on an annual basis.

Sustainable funding

Implementing some of the Cook Islands CBD obligations has largely been made possible through donor funding, in particular from the Global Environment Facility (GEF). Implementation is therefore heavily dependent on external sources of funding and limited to the goals and activities that were priority when the project was developed. Some flexibility is also possible. When projects are active, there are funds available to support biodiversity implementation related to the project and for education and awareness. Once projects are completed, then activities rely on the limited funding available through Government or are put on hold until further funding is found.

Government is expected to provide follow-up funding once the project comes to an end however government usually don't have the available funds to do so or funds are usually allocated to urgent country priorities. There is a need to identify and develop in-country and innovative sources of funding or joining tourism operations with biodiversity conservation activities in the Pa Enua to support ongoing conservation work e.g. nature tours through protected areas.

Implementation and reduce consultation

The Pa Enua has been consulted on their needs in conservation and there is a need to carry-out more implementation of activities and less consultation. The ability to implement many activities however is directly tied to availability and sustainability of funds.

Information sharing

With the Cook Islands Government's network centralisation, government agencies are able to share documents online. However, other agencies need to be part of the network to readily share information on what they are already doing and communities need to be made aware of this. A group of GIS officers from various agencies are facilitating a process of developing a central geospatial information portal, possibly using the portal established by Emergency Management Cook Islands.

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