Republic of the Marshall Islands
Fifth National Report
Convention on Biological Diversity

Office of Environmental Planning Policy Coordination
Majuro, Republic of the Marshall Islands

February 2017

Executive Summary

This 5th National Report for the Republic of the Marshall Islands provides an update on the biodiversity status and trends, as well as progress towards the implementation of the Strategic Plan for Biodiversity 2011-2020 including the Aichi Biodiversity Target 2020. The report is divided into three main parts with part one focusing on the importance of biodiversity to the people, the state and threats to biodiversity and the implications of changes to biodiversity; part two focuses on the actions and implementation of the national biodiversity strategy and action plan; and part three focuses on alignment of national targets to the Aichi Biodiversity Targets. This report is the end product of a consultative process undertaken through the development of the national blueprint for conservation areas plan and the 2016 State of Environment report for RMI.

The value of biodiversity to the wellbeing of Marshallese remains critical and it continues to inspire communities and the government to actively pursue actions and policies in order to safeguard it for future generations. Biodiversity is the cornerstone for economic opportunities and development of the country. It strengthens cultural ties of the current population to their fore-parents and through this connection provides the knowledge for community to instill good practices for the conservation of resources.

Some major key drivers continue to cause significant impacts to RMI's biodiversity and environment. Old challenges such as the fallout from nuclear testing and bombing of atolls combined with climate change and associated extreme weather events (severe and increasingly frequent typhoon events and drought) are seriously challenging the viability of communities in many of the atolls in RMI. Scientists fear that a storm surge or typhoon brought about by climate change could dismantle the Runit Dome releasing 84,000m^3 of plutonium radioactive waste into the Pacific Ocean. Furthermore, accumulation of heavy metals in the seabed and subsequent uptake by marine species make these resources toxic for human consumption. Ongoing challenges with population growth, waste management and urbanization are putting pressure on an already stressed biodiversity and environment. While the fisheries provide the much needed economic revenue for the government (14% of the revenue in 2014), the state of the fishery resources is in dire straits. The bigeye tuna is in a critical situation with harvesting rate above its maximum sustainable yield; the yellowfin tuna becoming vulnerable to overfishing.

Despite these challenging drivers, there are many positive initiatives implemented by the government, communities and partners in protecting and conserving biodiversity and ecosystems. These initiatives include developing policies, strengthening legislative support and declaring of conservation areas including the whole of RMI's exclusive economic zone as a shark sanctuary. Establishing national frameworks and mechanisms and providing an enabling environment to foster collaboration and cooperation amongst the various sectors are some of the positives steps. The establishment of the Coastal Management Advisory Council comprising of a wide range of stakeholders enables biodiversity mainstreaming and overseeing a coherent conservation development in the country. The uptake of traditional system and marrying it with modern methods has enabled the inclusion of 'Mo' as an important management tool for protected areas.

RMI working in partnership with neighboring countries of Micronesia, as well as the wider Pacific Island community embarks on setting ambitious biodiversity targets to ensure that biodiversity is not only protected but also thriving. Under the Micronesia Challenge, RMI's has achieved a 15% target for terrestrial conservation and a 20% target for marine conservation areas. These achievements have

surpassed the targets set under the Aichi Biodiversity Target. In terms of practical outcomes – the Mule (an endemic pigeon) was close to extinction with eight breeding pairs. The efforts by the government and the Marshall Islands Conservation Society contributed to Mule numbers increasing to over 80 birds.

The government have also identified a number of initiatives to generate the much needed funds to support the implementation of biodiversity conservation activities. Through the Micronesia Conservation Trust, RMI stakeholders can access parts of the Micronesia Challenge endowment fund for conservation purposes.

While the 2015 MDGs targets have passed, the progress and achievements by RMI have been mixed. Great progress has been made with regards to provision of safe drinking water for the population (Target 7C); good progress towards reducing biodiversity loss (Target 7B); steady to somewhat slow progress in mainstreaming sustainable development principles and practices into planning and development processes; serious deficiency in addressing sanitation for communities (Target 7C); and concerns with high population densities in Majuro and Ebeye with adverse socio-economic impacts (Target 7D).

Biodiversity and conservation efforts in RMI have been progressive over the past decade. The Aichi Biodiversity Targets are well within the achievable realm for the government and its partners. While funding and capacity are the biggest hurdles when it comes to implementing biodiversity actions, the leadership by the Government through supporting civil society, private sector and communities and innovative thinking to resolve ongoing challenges.

Acknowledgements

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The contribution of partners, especially members of the Coastal Management Advisory Council (CMAC), is acknowledged with appreciation. In particular acknowledge contribution from the Marshall Islands Marine Resource Authority (MIMRA), the Republic of the Marshall Islands Environmental Protection Authority (RMIEPA), the Ministry of Resource & Development (MoR&D), the Economic Planning Policy & Statistic Office (EPPSO), the Office of the Chief Secretary and the Office of Environmental Planning & Policy Coordination (OEPPC) – kommol tata.

Acronyms

ABS	Access and Benefit Sharing
CCCT	Climate Change Country Team
CFC	Chloroflurocarbon
CITES	Convention on the International Trade of Endangered Species
CMAC	Coastal Management Advisory Council
CNMI	Commonwealth of Northern Mariana Islands
COTS	Crown of thorns starfish
EDRR	Early Detection Rapid Response
EEZ	Exclusive Economic Zone
ENSO	El Niño–Southern Oscillation
FFA	Forum Fisheries Agency
FSM	Federated States of Micronesia
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gas
HCFC	Hydro-Chlorofluro Carbon
IAS	Invasive Alien Species
IUCN	International Union for the Conservation of Nature
MICS	Marshall Islands Conservation Society
MIMRA	Marshall Islands Marine Resources Authority
MRISC	Micronesia Regional Invasive Species Council
NBSAP	National Biodiversity Strategy and Action Plan
NISSAP	National Invasive Species Strategy and Action Plan
ODP	Ozone Depleting Potential
ODS	Ozone Depleting Substance
PAN	Protected Area Network
PNA	Parties to the Nauru Agreement
PROCFish	Pacific Regional Oceanic and Coastal Fisheries
RMI	Republic of the Marshall Islands
SPC	Secretariat for the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SST	Sea Surface Temperature
TREDS	Turtle Research and Monitoring Database System
US	United States
VDS	Vessel Day Scheme
WCPFC	Western Central Pacific Fisheries Commission

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PART 1: An update of biodiversity status, trends and threats, and implications for human well-being

1.0 The importance of biodiversity for the Republic of the Marshall Islands (RMI)

People of the Marshall Islands have a strong bond with the land and the sea and the array of species associated with these ecosystems. Marshallese's existence depended on these natural resources. The people of RMI is said to be much more part of the land biodiversity than many other areas due to their influence in shaping the various atolls in the country (Muller & Vander-Velde 1999). The forests and trees are important to RMI because they provide ecosystem services such as stabilizing the otherwise sandy and rocky soil, protecting other trees and living things from the constant influence of salt spray, wave protection and providing habitat for endangered and endemic animals. The people recognized the importance of a healthy marine environment because of the abundant resources that benefit them. Furthermore, the environment provides food for the people and a major part of the economy.

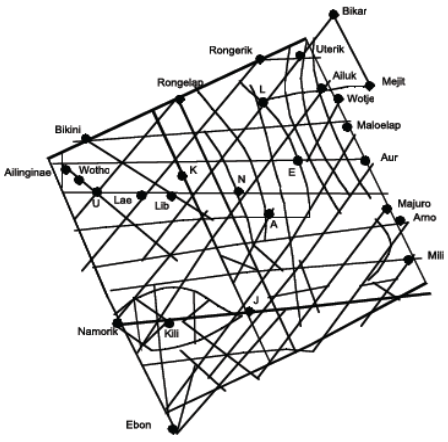


Fig. 1: Wapepe – a traditional Marshallese navigation chart

The people of the Marshall Islands are accomplished seafarers, navigators and fishermen (Fig. 1). The many fishing methods devised and used demonstrate a deep understanding of sea life, ranging from the simple hook and line to nets, traps, spears, clubs, rope and coconut fronds. Some methods were used only for specific types of fish, in specific areas or seasons. Some methods involved the participation of many people and some were practiced by the individual. In the past, fishing was accompanied by complex taboos, procedures and magic chants that integrated the spiritual and social life with the methods for gathering food. Social hierarchy determined who could fish and where. Accomplished fishermen were granted prestige in their communities. Many traditional fishing practices remain in use today, but many are being lost along with the in-depth understanding of the sea and its creatures. Moreover, fish and other marine creatures remain important subsistence foods, the catching and sharing of which revive culture and community (Reimaanlok 2007).

1.1 Economy

The Republic of the Marshall Islands (RMI) per capita gross domestic product (GDP) (Fig. 2) is underpinned by the country's natural environment. Biodiversity is the foundation to the subsistence living of the people and is of significant cultural importance. With its small land area and a small proportion suitable for settlement, land is the most prized possession and the basis of Marshallese culture. The people have developed and maintained a remarkable knowledge of native forests and plants,

Fig. 2: RMI's per capita GDP [source: www.tradingeconomics.com / World Bank]

and strong skills in agro-forestry. The terrestrial vegetation is dominated by coconuts, and occupies some 60% of the land. The fishery sector contributes significantly (12%) to the country's economy (Table 1). Copra was once a main income earner for many outer islands but the challenge with erratic shipping to these remote places caused a shift towards handicrafts. Handicraft making was once the domain of the women, but more and more men have shifted from copra production to this sector due to convenience, especially in terms of shipping to tourist areas.

2007 Fisheries export	US$
Coastal export	450,000
Aquaculture export	130,000
Local Longliner export	1,430,000
TOTAL	2,010,000

Table 1: 2007 Fisheries export revenue. [source: Gillett 2011]

1.2 Cultural connection

The culture, history and natural environment of the Marshallese cannot be separated because specific places, rocks, trees and animals have powerful cultural meaning. Land is 97% privately owned and controlled by three titles: Iroij (chief), Alap (landowner or clan elder) and Ri-jerbal (land steward). The Iroij has the highest authority and he or she controls all affairs concerning land rights. Land is prized above all else and the conservation and use of the environment is linked to Marshallese culture and traditions. The **Mo** sites (tradition conservation sites) continue to influence the land management today. There are conditions that apply to Mo which include seasonal harvesting in the marine, coastal and terrestrial environments, taboo sites for Iroij and Alap, as well as burial sites.

The backbone of the Marshallese culture is the traditional outrigger canoes, known locally as Walap, Tipnol or Korkor. The outrigger is an important metaphor of the Marshallese culture. It links to the navigation and weather skills of the people. The stick charts Rebbelip (showing sailing direction) and Wapepe (showing wave patterns) are used for traditional navigational training (Fig. 1). The lines in the Rebbelip, Meto and Wapepe – representing the currents are made of coconut fronds or hibiscus, whereas the points of islands are made of Likajir (cowry) shells.

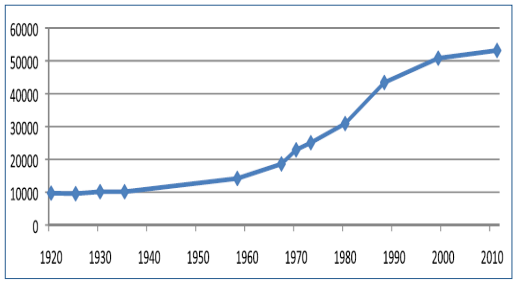


Fig. 3: Population growth since 1920. [RMI Census 2012]

Biodiversity and ecosystem services are critical for the well-being of Marshallese. Biodiversity provides material for the manufacture of crafts. Overpopulation on some of the atolls remains a challenge, with Majuro and Ebeye having densities among the highest in the world. The RMI population has steadily increased from 9800 in the 1920's census to 53,158 in the 2011 census (Fig. 3). The majority (74%) live on Majuro atoll, whereas the outer islands have diminishing populations. An increasing number of people on the outer islands have migrated to Majuro and a mass out-migration of people has seen some 11,000 depart to live overseas, with the majority moving to the state of Arkansas in the United States. If this trend continues it will have an impact on biodiversity.

2.0 Changes in the status and trends of biodiversity in Marshall Islands

The RMI's floral and faunal composition is mostly marine. Marine biodiversity give RMI its distinctiveness, with certain atoll communities known locally for their unique marine settings (Table 2). The natural terrestrial ecosystem all contain species normally associated with the ocean (e.g. sea birds, land crabs, land algae, etc.). Most of the native land animals in RMI are crabs – hermit crabs (*Coenobita* spp.), coconut crab (*Birgus latro*) and other land crabs (Muller & Vander-Velde 1999).

Flora & Fauna	Total
Total number of species	5821
Number of native species	1524
Percent of native species	26.18%
Number of species endemic to RMI	57

Table 2: Total recorded species in RMI. [source: SOE 2016]

While much of the outer islands remain relatively unscathed from the pressures experienced in urbanized areas, it is just a matter of time before they are also impacted. The reduction of fish diversity and shark abundance in urban centers such as Majuro is a negative trend and serves as a warning signal for the outer islands. Increasing demand for fish production in the urban centers may lead fishers to shift to alternate fishing grounds in the outer islands, which can threaten biodiversity in these areas if management measures are not in place.

The state of health for the marine environment is mixed based on the unique characteristics of the islands – some pristine, some with low fishing pressure due to low population density, and some with high fishing pressure. There is a serious concern in the increasing trend of importing fish from the outer islands to the urban centers. Ultimately, this will affect the integrity and the ecological function of those remote ecosystem. Another highly concerning development is the safety of consuming reef fish from the Kwajalein area. A recent report from the US army indicates a high toxicity of all reef fish in Kwajalein and that an immediate ban on fish consumption should be considered. The issue should be addressed by fully understanding the source of the contamination, taking steps to prevent additional contamination, remediating the Kwajalein lagoon and ensuring that no additional areas in RMI are contaminated.

The introduction of invasive alien species pose one of the greatest threats to island biodiversity. Together with other threats like pollution, over-harvesting and diseases, will cause irreversible harm to RMIs biodiversity.

2.1 Endemic Species

Endemism in RMI's is relatively low due to evolutionary and geographical influences. Colonization of land relies on currents and wind, as well as attaching on floating objects. While estimating the number of species to be native is an educated guess, there is consensus that at least three plant species (two grasses and a false-spider lily) are the only endemics on land.

Many of RMIs endangered species are endemic which means they occur nowhere else on earth (Table 2). These species are of particular concern because of their limited geographic range (Fig. 4). Some species of mangroves (*Sonneratia alba*) are found on a few atolls. There is concern that due to their limited range they could easily be threatened by human pressure, development or pollution.

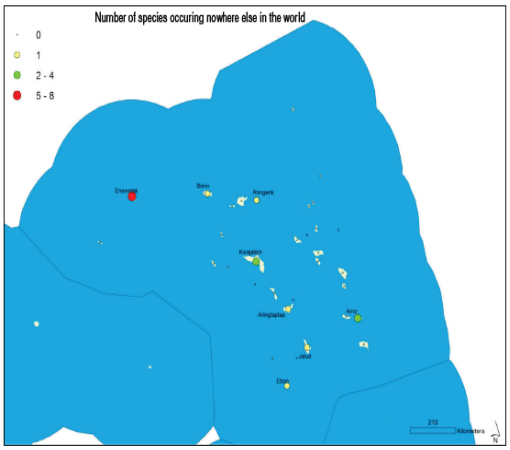


Fig. 4: Map showing the location of RMI's endemic species [source: RMI SOE 2016]

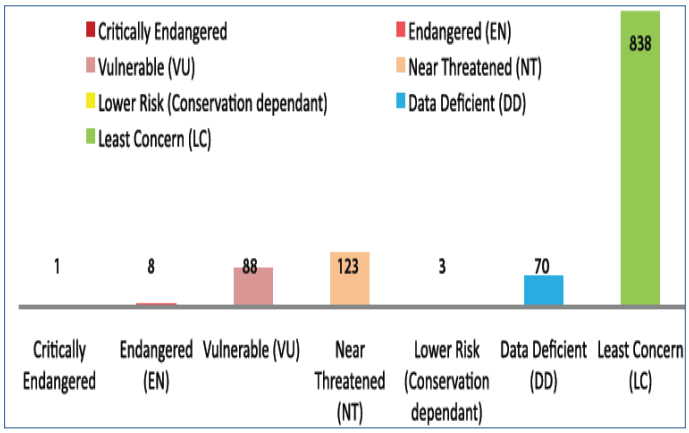


Fig. 5: Number of RMI species categorized under the IUCN Red List [source: RMI SOE 2016]

The general consensus is that the country's biodiversity is deteriorating, with the decline of the coastal and near shore areas of the greatest challenge. Some recovery plans exist but are generally poorly supported, and there is a very low state of knowledge about the country's overall biodiversity.

Of the 57 endemic species, only four have been assessed by the IUCN: three are endangered and one is extinct. The very nature of endemic species is that they are sensitive to extinction. A few of these endemic species only occur in one atoll, making them extremely rare. Enewetak has eight endemic species (the highest number of all atolls), followed by Arno and Kwajalein with four endemic species. Ailinglaplap, Bikini, Ebon, Jaluit and Rongerik all have one endemic species which makes them a priority for conservation and protection.

2.2 Species of local Concern

There are 61 species and subspecies considered for conservation by RMIs government and its partners (IUCN, CITES and US Fish and Wildlife). Based on the nationally compiled list of animals and plants:

- 13 nationally endangered or critically endangered species (five marine mammals, three birds, and five marine reptiles: one being critically endangered).
- 5 are vulnerable species – one bird, one shark, three arthropods, (*Tridacna gigas* and *T. derasa* giant clam species, and the Triton's shell *Charonia tritonis*) – and one extinct species, the Wake Rail (*Gallirallus wakensis*).

The 18 threatened species represent 31% of total species considered for conservation. The other 43 species are listed as Near Threatened, Low Risk or (with conservation measures), Data Deficient or Least Concern (Fig. 5).

2.3 Threatened species

The RMI government takes the threatened species issue seriously and has made initiatives to establish legislation to protect 19 endangered species: 18 are marine and one terrestrial species. Other threatened species are protected by individual atoll local government jurisdictions. The local governments set the restrictions on land and near-shore marine resources, which include the conservation of biodiversity. The Marshall Islands Marine Resources Authority (MIMRA) provides advice and technical assistance to local governments.

The RMIs threatened species list includes the endangered, vulnerable and critically endangered – species, and most are found in the marine environment. Terrestrial species make up about 0.5%. The most comprehensive survey of biodiversity in 2000 found that RMI has more than 5,821 species (Vander-Velde, 2000). The IUCN assessed 1130 species of the 5821 species identified by Vander-Velde and found that 101 were threatened by extinction. The Hawksbill turtle is perhaps the only species found in RMI that is critically endangered. Eight species are listed as endangered and 88 as vulnerable, while the remaining species are listed as near threatened (NT), lower risk (conservation dependent), data deficient (DD) or least concern (LC) (Fig. 5).

- **Coral Reefs**

Coral reef ecosystems are relatively intact and provide key ecosystem services, including food. The condition of the reefs, particularly in the less populated islands, has a major positive impact on sustainable livelihoods, including fisheries.

Coral cover provides an indirect measure of land-use impacts and erosion, fishing pressure, relative sea surface temperature (SST), presence of disease and predators like the crown of thorns starfish (COTS) and mechanical damage from anthropogenic sources or natural phenomena like typhoons. Trends in live coral cover indicate the relative resiliency and health of coral ecosystem at a given site.

Coral reefs in RMI undergo a cycle of decline and recovery from COTS or typhoons. One example is the COTS outbreak in southern Majuro between 2004 and 2009 (Waddell, J.E. and A.M. Clarke (eds.), 2008). Coral cover in RMI is relatively healthy. However, the coral bleaching event in 2014 may have reduced coral cover and recovery. A survey at the end of 2014 suggested that up to half of Majuro's coral cover was affected. Documentation of coral bleaching events in Majuro from 2008 to 2014 indicates that this is becoming more common. However, the dominant coral species found in Majuro is *Porites rus*, which is more resistant to changes in temperature and sunlight exposure compared to other species. Variations in coral cover trends show higher coral cover in rural atolls, compared to urban atolls. However, the overall healthy reef system has the capacity to provide all the fish protein needed for human consumption now and into the future, provided appropriate management measures are put in place (PROCFish, 2009). Majuro's reef system is under significant pressure due to human impacts, over-fishing

and developments such as over-population and aggregate mining. Generally, the coral reefs on the northern islands of Majuro are healthy, although there is limited data available from the surveys.

Reef condition (e.g. coral and algal cover) can impact the relative density, species and size of fish. For example, reefs in a state of heavy algae cover are indicative of the absence of algal-eating herbivores, like parrotfish and surgeonfish that could otherwise facilitate coral recovery. High coral cover supports a diverse array of fish, who use corals for shelter and feeding. Inshore fishing typically targets larger reef fish (e.g. goatfish, parrotfish and surgeonfish), and therefore can impact the health of reefs by removing important grazers from the ecosystem. Fishing pressure is mainly led by human population and access to fish markets.

Reef fisheries target both reef fish and invertebrates (e.g. crustaceans, clams, sea cucumbers and trochus). The Marshallese people are reliant on reef fishing for subsistence. Reefs and inshore species are mutually supportive, where reefs support fish and invertebrates with food and shelter, and fish and invertebrates help maintain and establish reef systems. The biomass of reef fish provides an insight into the health of the inshore environment in addition to anthropogenic pressures like fishing and development.

2.4 The marine environment

Marine species make up most of the biodiversity of RMI (Fig. 6). The overall state of RMI's marine environment is intact and in good and stable condition. There are over 1000 species of fish, 1600 of mollusk species, and more than 250 species of algae and stony corals. Further surveys are likely to reveal more species in all categories. The recent State of Environment report for RMI shows a mixed picture with regards to the health of the marine environment.

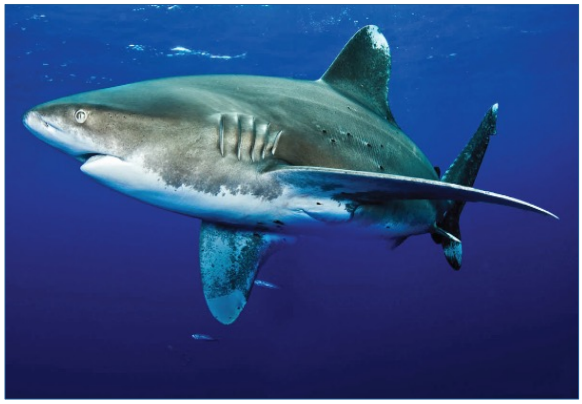


Fig. 6: The oceanic white-tipped shark *Carcharhinus longimanus* is the most vulnerable shark species. [photo Terry Goss]

- Offshore marine environment

The offshore marine environment is in fair condition but the trend is deteriorating. This is attributed to the state of the tuna fishery where the biomass is said to have declined to 40%, whereas fishing effort has increased dramatically. Most of the tuna species have reached or exceeded their maximum sustainable yield. The inshore environment is in relative good condition with a trend of good (mostly in outer islands) and needs improving (mostly around Majuro where the population is expected to continue to grow). In terms of conservation area, RMI has established 63 marine managed areas covering about 70% of reef in RMI. Management plans for the majority of these managed areas are lacking.

- Marine water quality

The water quality in the lagoons is said to be in poor state and the prognosis does not look good. Not only the bacterial counts are very high (24,000MPN/100ml) but in some areas the contamination from pesticides and heavy metals make consumption of seafood deadly.

- Marine mammals and turtles

The country is blessed with having diverse species of turtles, sharks and other economic and culturally important species. Most of the species have some conservation management consideration supported by legislation but the lack of enforcement remains a challenge.

The marine turtle populations are declining regionally and globally. Five turtle species are known to occur in the Pacific region, and four are known from RMI. There is limited information to fully understand the state of stock structure, abundance and trend in turtle populations in RMI and the region. Turtles have played an important role in the lives of the Marshallese people for centuries. They are a prestigious ceremonial food, with cultural restrictions on take and consumption. They are also iconized in Marshall Island symbolism, visual art, legends/myths, and rituals. However, globalization, changes in social practices, and loss of respect for the culture, has resulted in negative impacts on turtle populations. Reduction of this resource is recognized as a loss to the Marshallese way of life. The term 'subsistence take' is not well defined, and it seems to be open season on turtles in RMI, the only restriction being a minimum size limit.

Fig. 7: The Hawksbill turtle is the only critically endangered listed species found on Marshall Islands [photo: Marine Photobank]

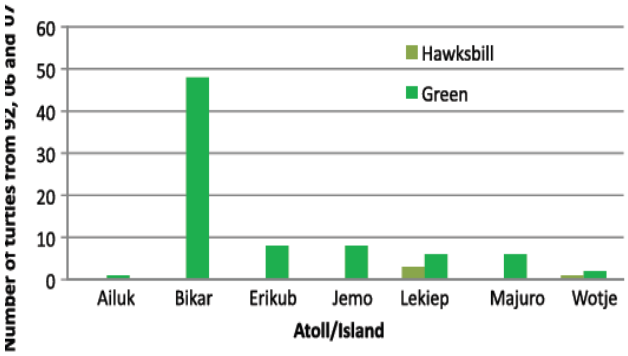


Fig. 8: Turtle numbers recorded in surveys carried out in 1992, 2006 & 2007. [source: RMI SOE2016

The Green turtle (*Chelonia mydas*) is the most common of the four turtle species that occur in RMI. There were over 620 nesting sites and over 70 individuals recorded during the surveys of 1998, 2006 and 2007. The number of nesting turtles in Bikar alone was estimated at 100–500, considered to be the largest nesting site in Micronesia in the early 1970s (NMFS and FWS 1998; Hendrickson, 1972). Exploitation of sea turtles has become easier with the use of motor boats and other modern equipment. Hawksbill turtles (*Eretmochelys imbricata*) are listed as critically endangered in the IUCN Red List and are considered rare in the waters of RMI, with only a single nesting site recorded in the 1970s. Bikar, Erikub and Jemo are the three main nesting sites for the Green turtle.

There are still cases of the traditional practice of seeking permission from a high chief, prior to harvesting turtles. The lack of awareness on existing laws, lack of a monitoring program and very limited enforcement has led to uncontrolled turtle harvesting, resulting in a 'poor' status of RMI turtle populations. Moreover, turtles have moved into the monetary economy, despite laws prohibiting such practices. With these factors, turtle numbers will continue to decline.

The Reimaanlok: National Conservation Area Plan is a key instrument used by MIMRA and its CMAC members to designate protected areas and develop community-based management plans for natural resources, including turtles and turtle nesting sites. With the growth of protected areas through Reimaanlok, the potential for local communities to increase protection and management of these species should be considered, given the limited capacity to monitor and enforce legislation and implement conservation policy.

Common Name	Scientific name
Minke whale	*Balaenoptera sp.*
Blue whale	*Balaenoptera musculus*
Fin whale	*Balaenoptera physalus*
Humpback whale	*Megaptera novaeangliae*
Sperm whale	*Physeter macrocephalus*
Bryde's whale	*Balaenoptera sp.*
Killer whale	*Orcinus orca*
Short-finned pilot whale	*Globicephala macrorhynchus*
Melon-headed whale	*Peponocephala electra*
Common dolphin	*Delphinus sp.*
Pantropical spotted dolphin	*Stenella attenuata*
Striped dolphin	*Stenella coeruleoalba*
Spinner dolphin	*Stenella longirostris*
Bottlenose dolphin	*Tursiops sp.*
Rough-toothed dolphin	*Steno bredanensis*

Fig. 9: List of cetaceans recorded from RMI

Cetaceans (whales and dolphins) have a very slow reproductive rate, making them (much like most shark species) particularly at risk from any harvesting activity. Fifteen species have been reported from RMI (Figure 9). However, this is most likely an under-representation of the numbers as there is no formal monitoring program for cetaceans.

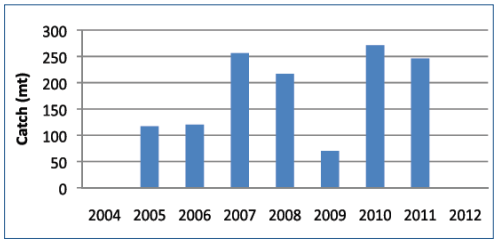


Fig. 10: Number of shark by-catch reported since 2004 in RMI's EEZ (MIMRA 2012)

Sharks are now protected following the RMI government's declaration of their EEZ as a Shark Sanctuary in 2011. RMI's efforts is part of the Micronesia overall commitment towards a regional sanctuary for shark. This covers an area of 6.5 million km^2. About 183 metric tons of sharks were caught annually from 2005 to 2011 before the sanctuary was established (MIMRA by-catch data) (Fig. 10). Whale sharks *Rhincodon typus* are listed as vulnerable under the IUCN Red List and occasionally get caught up in fishing nets from purse seiners.

- Tuna fishery

The tuna fishery and the offshore fishery in general are the top income earners for RMI which is about 14% in 2014 (Graduate School, 2015). The average fish consumption per person per year is about 39 kg with rather more in the outer islands. However, the Marshallese people consume most of their fish protein from reef fish. The reefs are able to supply 700 kg of fish per person per year (Bell, 2011).

Serious concerns have been expressed on the state of the tuna fishery. Strengthening the monitoring and surveillance is necessary to ensure the tuna stocks are sustainably harvested and managed in the EEZ. The main consumers are canneries in Thailand and Indonesia. A concern with the increased number of large fishing vessels operating in the country is the potential for accidents such as that seen when the purse seiner Fong Seong 666 grounded on a reef off Majuro resulting in over 2,415m^2 of coral reef being damaged.

Offshore fisheries production is an important indicator of pelagic (offshore) fish stock health. This indicator measures the state of offshore fisheries and management, as well as the general state of commercial species and by-catch trends, including sharks and other species. From 2002 to 2012, the tuna fishery in RMI was dominated by foreign purse seine fleets from Asia, Europe and the United States, mainly targeting skipjack tuna. There are a growing number of domestic long line vessels of mainly Asian-flagged companies. These long-liners target other tuna species such as albacore, yellowfin and bigeye. Skipjack tuna harvested by purse seining is the major component of the fishery in the EEZ. The other two target species are bigeye and yellowfin tuna which make up 20 percent of the total fisheries catch.

In the last decade the tuna catch has been stable except in 2003, when it declined in RMI and the rest of the region. During the same period the RMI skipjack catch has topped out between 15,000 and 20,000 metric tons. Current trends indicate that the tuna catch for RMI is stable but, potentially, is maxed out due to negative trends in pre-harvest biomass levels. One notable negative trend is the bigeye tuna stock, which is being harvested unsustainably in the western central Pacific region. Regional stock assessments indicate that key tuna stocks in sub-regional waters encompassing RMI have declined in biomass up to 40%, based on a 2000 baseline study (SPC, 2013). Recent SPC stock assessments for the western Pacific report that albacore, yellowfin and skipjack fisheries all exceed maximum sustained yields.

2.5 Wetlands

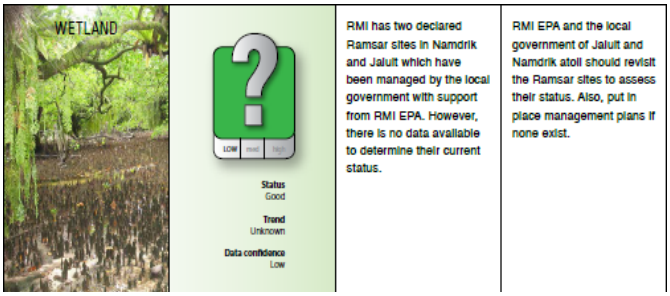


Fig. 11: State of wetlands in RMI [source RMI SOE2016]

Atoll	Type	Area (km^2)
Jaluit	Whole atoll	11.34
Namdrik	Madad islet	0.04

Table 3. Total wetlands in the RMI

The state of the wetlands in RMI is currently good although in terms of the trend it is unknown (Fig. 10). RMI has two declared wetlands of international importance with a combined area of 11.38 km^2 (Table 3). A third site is currently being considered (Lib Island). The declared sites (Jaluit and Namdrik) are important breeding areas for the endangered hawksbill and green turtles, the coconut crab and other rare species (See Table 4). These sites are mapped and being formally managed. Namdrik consists of two wooded islets with an extensive reef flat between them. A subterranean Ghyben-Herzberg water lens lies under the islets, which provides a precious supply of freshwater. The atoll is unique because there are no navigable passes into the central lagoon, and it supports a rich mangrove forest that is home to some 150 species of fish. Active management of the Ramsar sites is limited by distance and budget limitations. Both Ramsar sites have local management plans that are managed by the local government

with support from the RMI EPA office. An ecological study in Namdrik found that the reefs are healthy and intact (Hulk et. al., 2013).

Species	Type	Habitat	Atoll	IUNC Red List Status
Mangroves	Forest	Terrestrial	Jaluit, Namdrik	Endangered
Giant Swamp Taro	Plant	Terrestrial	Namdrik	Vulnerable
Serrated Ribbon Seagrass	Plant	Marine	Namdrik	Endangered
Ponapean peperomia	Plant	Terrestrial	Namdrik	Vulnerable
Green Turtle	Turtle	Marine	Jaluit, Namdrik	Endangered
Hawksbill Turtle	Turtle	Marine	Jaluit, Namdrik	Critically Endangered
Humphead Wrasse	Fish	Marine	Namdrik	Endangered
Bristle-Thighed Curlew	Bird	Terrestrial	Namdrik	Endangered
Frigate	Bird	Terrestrial	Jaluit	Vulnerable
Noddy Tern	Bird	Terrestrial	Jaluit	Least Concern
White-tailed tropicbirds	Bird	Terrestrial	Jaluit	Least Concern
Crested Tern	Bird	Terrestrial	Jaluit	Least Concern
Brown Boobies	Bird	Terrestrial	Jaluit	Least Concern
White Tern	Bird	Terrestrial	Jaluit	Least Concern
Micronesia pigeon	Bird	Terrestrial	Jaluit	Near Threatened
White-browed Rail	Bird	Terrestrial	Namdrik	Least Concern
Tree-hole Mosquito	Insect	Terrestrial	Namdrik	Data Deficient
Crane Fly	Insect	Terrestrial	Namdrik	Data Deficient
Arno Skink	Lizard	Terrestrial	Namdrik	Least Concern
Coconut crab	Crab	Terrestrial	Jaluit	Data Deficient
Mangrove crab	Crab	Marine	Jaluit	Data Deficient
Mantis Shrimp	Crustacean	Marine	Namdrik	Data Deficient
Trochus	Mollusc	Marine	Jaluit	Data Deficient
Sea cucumbers	Echinoderm	Marine	Jaluit, Namdrik	Data Deficient
Blacklip Pearl Oysters	Mollusc	Marine	Jaluit	Data Deficient
Tridacna gigas	Mollusc	Marine	Jaluit	Data Deficient
T. maxima	Mollusc	Marine	Jaluit	Data Deficient
T. squamosal	Mollusc	Marine	Jaluit	Data Deficient
Hippopus hippopus	Mollusc	Marine	Jaluit	Data Deficient

Table 3. Species found in the two wetlands.

2.6 Agriculture

Agriculture in atoll environments has always been challenging, as illustrated by the Pat (traditional taro pit). The Marshallese have a long history of making major investments to grow staple crops. Agriculture was traditionally a key component of RMI's economy, mainly permanent crops and plantations (Fig. 12). Nearly all families were once involved in agriculture. There has been a steady decline and loss of engagement in the agricultural sector with about less than half of households involved (Fig. 13). Various factors are attributed to this decline with reduction of soil fertility through the loss of organic matter and nutrients an important consideration. The nuclear tests in the 1940s and 1950s have changed the terrestrial environment and human interaction with the environment by reducing the already scarce area available to grow crops by removing thousands of metric tons of topsoil and by vaporizing several islets.

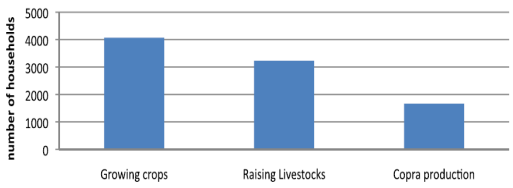


Fig. 12: Households engaged in agricultural activities

The abandonment of historic plantations and crop areas have led to the spread of invasive species, placing more pressure on the environment and reducing biodiversity.

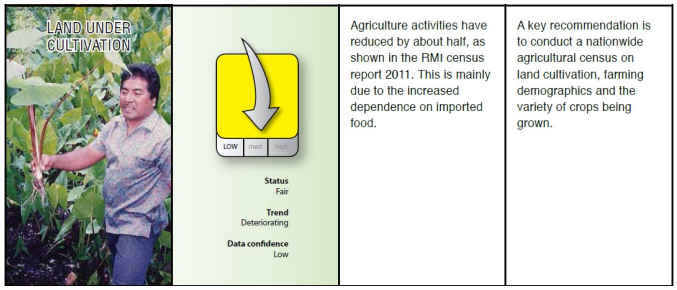


Fig. 13: Agriculture trend in the SOE report shows a deteriorating trend in the sector. [source: RMI SOE 2016]

The impacts which have negative effects on the agriculture sector include less food being produced locally, more imported food, loss of traditional agricultural practices, and prevalent spread of invasive species. The effects of rapid development in the main urban centers, as well as climate change (particularly changing rainfall patterns, drying out of soil and water land lenses, and saltwater intrusion) have further exacerbate the agriculture sector and the will of the people. Reduced agricultural output is also affected by globalization. For example, the relatively low price of imported food, and the challenges of transporting locally produced crops, makes it harder for local farmers to market their produce.

2.7 Forests

The original forests have been replaced by agro-forestry to support human settlements. The status of RMI's forest is said to be fair and the trend is currently stable (Fig. 14). However, this is likely to change as drivers such as climate change and population growth start to make inroads towards intact forest areas. Only a few atolls hold the last remaining native forest ecosystems. *Pisonia grandis* is one of the main forest ecosystems found throughout the RMI. Today, the agro-forest is a mixture of coconut, breadfruit, pandanus and banana trees, shrubs and herbaceous species. Other fruit trees were introduced to diversify food crops. Due to low soil fertility, there are few crops that can be grown in an atoll soil. RMI has a stable forest cover, which has changed very little in the last 25 years. There are 34 atolls and islands, of which the largest ten islands make up 74% (13,403 hectares) of the land area. Land cover mapping has been carried out on these larger atolls. RMI has about 70% total forest cover, which includes native forest, agro-forest, and coconut plantations. Fourteen percent of land cover area is listed as barren lands, which includes coastal areas and sand spits. About 12% of the landscape is urban land including roads and infrastructure, mostly on Kwajalein and Majuro, and about 4% is non-forest vegetation including rangeland and agricultural lands. A comprehensive study of botanicals has yet to be carried out although some atolls were studied decades ago. Three of these atolls have not been permanently occupied and represent an example of native vegetation. To understand the complexity of the forests ecosystems, a national baseline is needed for trend analysis and comparisons (SWARS, 2010–2015).

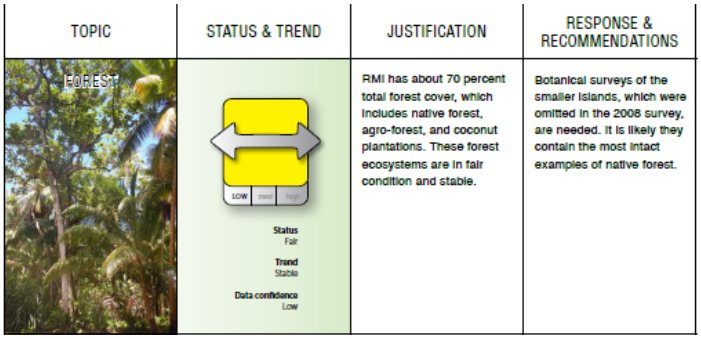


Fig.14. Forest status and trend from SOE report 2016. [source: SOE 2016]

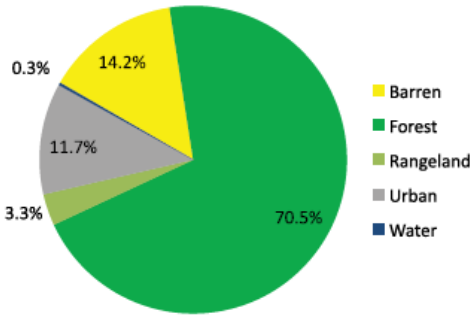
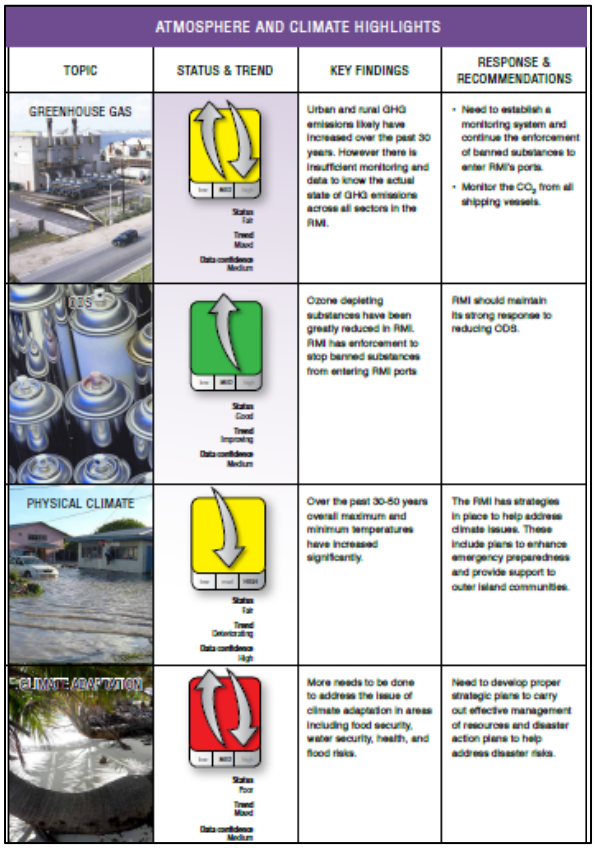


Fig. 15: Land cover type in 10 atolls

The information on forest condition indicates that about 37% of sampled trees had some form of damage, mostly caused by unspecified insects and other vegetation, including vines (SWARS, 2010–2015). This indicates that the existing forest cover is in moderate to fair condition. The land cover data is available for 10 atolls out of 29 and five islands, in GIS format. It shows that RMI is mainly covered by forest except in a few select locations where urban areas dominate. These are Majuro (49% urban) and Kwajalein (30% urban). Barren land cover is the second most common land cover type – this is made up of sand and coral bars along and between islets (Fig. 15).

2.8 Atmosphere and Climate Change



ATMOSPHERE AND CLIMATE HIGHLIGHTS

TOPIC	STATUS & TREND	KEY FINDINGS	RESPONSE & RECOMMENDATIONS
GREENHOUSE GAS	Status: Fair; Trend: Mixed; Data confidence: Medium	Urban and rural GHG emissions likely have increased over the past 30 years. However there is insufficient monitoring and data to know the actual state of GHG emissions across all sectors in the RMI.	• Need to establish a monitoring system and continue the enforcement of banned substances to enter RMI's ports. • Monitor the CO_2 from all shipping vessels.
ODS	Status: Good; Trend: Improving; Data confidence: Medium	Ozone depleting substances have been greatly reduced in RMI. RMI has enforcement to stop banned substances from entering RMI ports	RMI should maintain its strong response to reducing ODS.
PHYSICAL CLIMATE	Status: Fair; Trend: Deteriorating; Data confidence: High	Over the past 30-50 years overall maximum and minimum temperatures have increased significantly.	The RMI has strategies in place to help address climate issues. These include plans to enhance emergency preparedness and provide support to outer island communities.
CLIMATE ADAPTATION	Status: Poor; Trend: Mixed; Data confidence: Medium	More needs to be done to address the issue of climate adaptation in areas including food security, water security, health, and flood risks.	Need to develop proper strategic plans to carry out effective management of resources and disaster action plans to help address disaster risks.

Fig. 16: Status and trends of GHG, ODS, Physical Climate and Climate Adaptation in RMI

Four key areas where RMI's has been focusing on include Greenhouse Gases (GHGs), Ozone Depleting Substances (ODS), Physical Climate (air temperature, precipitation, and extreme climatic events), and Climate Adaptation (food security, water security, health and flood risks) (see Figure 16). GHGs have been shown to strongly influence climate change, which results in more intense storms and droughts, and higher sea level and temperatures. Tracking GHG emissions is important because it helps understand RMI's contribution to the global level and this in turn will help develop national targets as part of its obligations under the UNFCCC. Although the RMI's GHG emission trend has increased over the last decade (Fig. 17), it is negligible compared to developed countries. The need to develop a monitoring system for GHG emission is vital for RMI's efforts. In 2015, an unseasonal storm that hit Majuro causing serious property and environmental damage. This was made worse in 2016 when RMI went through an extreme drought even that was more severe than the 1997-1998 event. This stressed many of the natural resources including the biodiversity of the country.

A success story for RMI is the phasing out of ozone depleting substances over the last decade. RMI has fully complied with the Montreal Protocol. In 2004, RMI banned the importation of Chloroflurocarbons CFCs and has committed to phasing out Hydrofluorocarbons (HCFCs) by 2030.

The three types of ozone depleting substances to have been imported into RMI are CFCs, HCFCs and methyl bromide. Most of the CFCs and HCFCs are used in the refrigeration and air-conditioning sector, whereas methyl bromide is exclusively for fumigation of goods by quarantine officials. RMI made a commitment to the Ozone Secretariat to freeze its use of CFCs at 1.16 ODP tonnes from 1 July 1999. In 2000, the importation of CFCs to RMI resulting in a 0.53 ODP tonnes – well below its commitment. CFC is banned since 1994 and HCFC will be phased out by 2030.

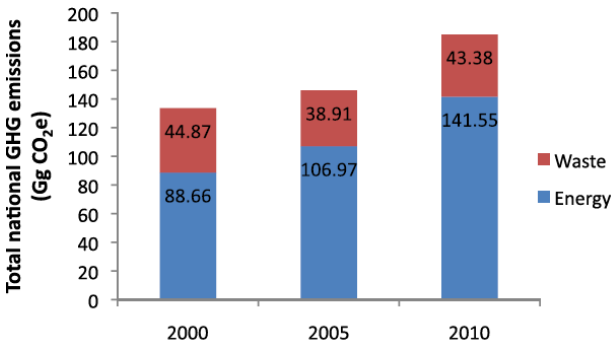


Fig. 17: GHG emission from 2000-2010

The physical climate trend for RMI does not look positive with annual rainfall declining significantly by 5%. Temperature trends are consistent with global warming trends, and there is frequency of warm days, whereas the number of cool nights has decreased.

3.0 Main threats to the biodiversity of RMI

The threats to the biodiversity of RMI are driven by a range of global and regional pressures such as globalization and exposure to world markets, rising incomes and population, urbanization, rapid expansion and growth of technologies, new and existing cultural norms and global climate change. These drivers are fueling local pressures such as land development, over-crowding of urban centers, waste generation and energy consumption and resource extraction. This is exacerbated by the following factors:

- Small land areas compared to the vast distances between atolls, combined with the relative isolation of the country, resulting in communication problems;
- Limited natural terrestrial resources placing a high pressure on cultivable land and agricultural crops;
- Coastal erosion due to construction activities in urban areas and to changes in sea-level;
- Destruction of coral reefs from human activities such as dredging, channel blasting, and boat anchoring;
- Pressure on marine resources within lagoons from overfishing and pollution, an on deep-sea fisheries from unregulated commercial exploitation;
- A high rate of population growth and concentration of people in a few urban areas leading to environmental pressures on land and sea resources;
- Increased pollution from solid and hazardous wastes, particularly in the urban areas; ·
- Increased eutrophication and pollution of coastal areas from sewage and industrial wastes; and
- Susceptibility to sea-level rise due to climate change.

The overpopulation in urban areas especially in Majuro, is one of the key local challenges for RMI. The impact can be seen by the demand for resources far outweighing what can be provided or supplied. More people generate more solid and liquid waste, and the severe lack of infrastructure means that

much of the wastes are dumped or discharged to the environment. The only waste management facility in RMI that collects data has breached its carrying capacity and poorly functioning septic systems are polluting the foreshore with high fecal coliforms.

Another unique threat to RMI's biodiversity is the fall-out from nuclear testing. The impacts of radiation on the flora of the islands remain to be determined, although initial observations by experts including Raymond Fosberg and reported in Muller & Vander-Veld (1999) indicated some abnormal growth impacts on certain plants. Some plants such as coconuts have been found to retain significant amount of Cesium-137 and hence when coconut crabs eat them, there is a build-up of Cesium-137 in their bodies. This will have devastating impacts on people that consume both the coconut and the coconut crab.

A number of other challenges are adding pressure to the health of RMI's biodiversity and ultimately to the wellbeing of the community. These threats are outlined below. Also refer to Case Studies 1 and 2.

Case Study 1

Population influencing fish biomass

In 2013 and 2014, two surveys were undertaken in three atolls with different population density and lagoon sizes.

- Rongelap has a particularly large lagoon (>1,000 km^2) with a very low human population.
- Majuro has a moderate sized lagoon with the highest population in RMI (Houk and Musburger, 2013).
- Namdrik has a very small lagoon (about 8 km^2) and a moderate human population of ~500 people (Houk et al, 2014).

The surveys found Rongelap to have a high fish biomass (six times that of Majuro), whereas Majuro and Namdrik have lower biomass. While the biomass range in Majuro is broad (~0–200 (kg/ m^2), biomass for Rongelap is higher than Majuro and Namdrik. Namdrik has a low human population, however the lagoon is small and isolated, which may explain its low biomass (Houk and Musburger 2013 and Houk et al,

Case Study 2

Food Security in RMI

Food production in an atoll environment is not easy. The early Marshallese developed a unique system of cultivation adapted to the poor soil quality of the islands. They also preserved food in case of famine or for long voyages. The status of food security is vulnerable, due to the increased dependence on imported food products and the decline in traditional food preparation and preservation. Major crops adapted to atolls include coconut, pandanus, breadfruit, and swamp taro grown in marsh areas. Sea level rise poses threats to taro farms and food security. Most introduced crops require modification for their growing to survive in the harsh atoll environment. Some breadfruit varieties are more resilient to atoll conditions. However, breadfruit does not tolerate salt water spray or prolonged dry periods which affect most introduced crops. The main livestock on atolls are pigs and chickens. The influence of climate change, pests and diseases are an increasing concern for both livestock, introduced crops and the people.

3.1 Population growth

RMI was one of the fastest growing island nations with an annual growth rate of 4.2 percent from 1980 to 1988. This slowed to 0.4% in the last decade. Between 1999 and 2011, only 2318 people were added to the total population. On the other hand there is a large population loss (estimated over 11,000 based on the 2011 census and 1999 projections). Another recent phenomenon is the smaller family size of Marshallese. Internal migration from rural areas to the urban centers has continued. In 2011 Majuro had 27,797 people or a 52% share of the total population. This percentage was lower (45%) in 1988. This

trend has mixed impacts on the environment, with urban areas adversely impacted, whereas outer islands are largely left in good condition, except where fishing pressure to cater for urban demand takes place (see Case Study 1).

3.2 Climate change

The country has never been more vulnerable to extreme climate and weather events. Global warming is threatening the very existence of the nation with storms that produce more frequent and stronger waves. El Niño–Southern Oscillation (ENSO) events act on this increasing sea level baseline, ranging between 10cm below neutral for an El Niño and 30cm above neutral for La Nina. The last decade up until 2014 has seen La Nina dominance, exasperating shoreline erosion. Climate change has contributed to the growing list of problems for biodiversity in RMI. Together with human activities, such as over-population, over-fishing, habitat destruction, coastal development, poor waste management and pollution have significant impacts on loss of or changes to biodiversity. Furthermore the atoll environment is fragile and more vulnerable to change than in high islands. Climate change is referable to global issues such as increases in sea surface temperatures (SST), sea-level rise, increases in ocean acidity, and increases in destructive typhoons. By mitigating human aspects the long-term impacts of climate change the RMI may be able to stave off some impacts of climate change, although ultimately they can do little to alter its impacts on a global scale. Some examples of the impacts of climate change include:

Case Study 3

Climate change and radioactive threat

Marshallese, scientists and environmentalists fear that a storm surge, typhoon or another cataclysmic event brought on by climate change could tear the concrete mantel of the Runit Dome releasing Plutonium-239 radioactive waste into the Pacific Ocean. 84,000 cubic metres of this radioactive waste is stored temporary in the Runit Dome, in view of a permanent solution, which decades later remain elusive. Enewetak atoll was the scene of 43 atomic bombs tested and much of the lagoon sediments is believed to contain the fallout of radionuclides. In 2015, Tropical Storm Nangka caused a surge of lagoon water to flood across the resettled island of Enewetak causing concerns for local residents on possible contamination of their homes and lands.

- Damage to coral reefs resulting in reduction or loss of food security.
- Damage to corals and other calcified species from increasing ocean acidity, resulting in loss of coral diversity and hence reef health.
- SLR which may cause loss of some coral species unable to react to the changes.
- Changes to the water lens because of SLR, with a resultant loss of drinking water security.
- Loss of land for human habitation, resulting in migration to already over-crowded population centers.
- Loss of land for agroforestry, with a resultant loss in food security.
- Release of thousands of cubic yards of radioactive debris from the nuclear testing (Case Study 3)
- Damage to infrastructure including cultural important sites
- Reduced rainfall affecting water availability

3.3 Invasive Species

Invasive species are one of the biggest threats to biodiversity in RMI, including predation on the endemic Mule. Other impacts include those on economic revenue, e.g. lower crop productivity, reduced export potential, and habitat change. Social impacts include increased human labor costs, reduced aesthetic value, loss of culturally important species including traditional medicines, and increased erosion affecting water cycles and supply. A study conducted in RMI in 2015 recorded 523 alien species that impact the environment, as invasive and potentially invasive species. Most are terrestrial plants.

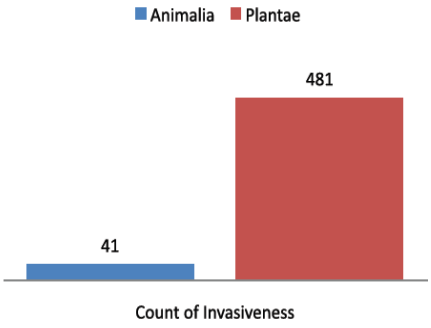


Fig. 18: Animals vs plants as invasive species in RMI

Of the 523 alien species, 41 are animals, the remainder is plants (Fig. 18). The most harmful ones to native flora and fauna are cats and rats. Many land and marine invasive species, plants or animals are threatening the biodiversity. The invasive species are unevenly distributed across the nation. Eight atolls have more than fifty identified invasives; these include Arno, Enewetak, Jaluit, Kili, Kwajalein, Majuro, Mili and Wotje. Majuro and Kwajalein have the highest number of invasives, 244 and 187 respectively, as the two atolls are the main ports of entry to the country. Once an invasive species establishes itself, eradication and control can be extremely difficult and costly. The well-established Merremia vine, the yellow crazy ant and red-vented bulbul bird are already having negative impacts by taking over ecosystem niches. RMI strengthened its management of Invasive Alien Species (IAS) and has its own cross-sectoral IAS Committee. RMI is a member of the Micronesia Regional Invasive Species Council, and joined with FSM, Palau, CNMI, Guam and Hawaii to develop the Micronesia and Hawaii Regional Biosecurity plan. In 2015, RMI approved its National Invasive Species Strategy and Action Plan (NISSAP) and has completed a desktop survey of IAS in priority sites. The cross-sectoral IAS Committee is also a member of the Pacific wide – Pacific Invasives Learning Network (PILN).

Biosecurity procedures exist at international ports of entry and there is capacity in Early Detection Rapid Response (EDRR). There are also weed management actions on Majuro, Bikini and Kili atolls (Moverley, 2016). Border responses are driven by economic pests; e.g. African snail and oriental fruit fly, but there is a need to increase support for invasives that do not have a perceived economic impact. A National Biodiversity Steering Committee has been established, and with the new NISSAP, RMI has a plan in place to address the threats on invasive species. RMI has endorsed their participation in the Regional GEF6 Invasive Species Project with a contribution of US$1m – this will improve the current situation and also shows the political will to improve.

3.4 Overharvesting

Bigeye tuna is of particular concern because the recent 2015 assessment reports that bigeye catch is well above its maximum sustainable yield and is considered overfished, with only 16% biomass pre-harvest remaining (FFA 2015). Albacore is vulnerable to being overfished as longline catch continues to increase dramatically. In addition, yellowfin is considered fully exploited with no room for expansion (WCPFC yearbook, 2014). The RMI pelagic fishery is dominated by skipjack tuna, followed by bigeye and

yellowfin. Skipjack tuna harvest data from 2002 shows a maximum catch of 35,000 tons, with an average catch of about 18,000 tons. Regionally, both bigeye and yellowfin are at risk. According to the Western and Central Pacific Fisheries Commission (WCPFC), bigeye is subject to overfishing and yellowfin stocks are vulnerable to overfishing (WCPFC, 2014).

By-catch represents over 1000 mt per year, composed primarily of blue marlin, followed by wahoo and mahimahi. The highest by-catch was recorded in 2010 where over 1,150 mt was caught. Although the numbers of annual by-catches seems low, over time if the trends increase, it can have major negative impacts on these untargeted fish species. There is a need for better fishing practices to control, better manage and determine the status of these fish species.

The leading cause of overfishing is economic exploitation. Unsustainable fishing leads to a collapse in stocks which balance the marine ecosystem. The removal of key species like sharks, that maintain the trophic balance, can impact the inshore and offshore ecosystems. A third of shark populations worldwide are considered endangered under the IUCN Red List. Prior to the shark ban, up to 250 metric tons of shark per year were either caught as by-catch or targeted. Shark harvesting in the Pacific is mainly of silky, hammerhead, white-tip and blue sharks, all of which are classified by the IUCN as near-threatened. Shark populations are extremely vulnerable to overfishing because sharks grow very slowly, and have a much lower capacity to reproduce than other bony fish species.

RMI is a member of the Parties to the Nauru Agreement (PNA) and the Forum Fisheries Agency (FFA) and is signatory to some international maritime conventions and treaties. The RMI tuna fishery is managed under PNA's Vessel Day Scheme (VDS), where member countries agreed to limit the number of fishing days. The number of fishing days are then allocated to each country and sold to the highest bidder. The PNA has benefitted RMI's economy and its marine resources. RMI is also part of the Niue treaty which was ratified in 1995. Under the treaty, the members of the FFA agreed to enhance the ability of surveillance and enforcement of their fisheries laws by working together to address illegal fishing and other unlawful activities.

Much like the oceanic sharks, reef sharks are susceptible to fishing pressure and are more likely to decline in number in highly populated areas. They are an important apex predator to the marine ecosystem as they help to maintain the healthy function of the reef ecosystem. Namdrik and Rongelap have three times more sharks compared to Majuro which has the most development and highest population density in RMI.

3.5 Solid and Hazardous Waste

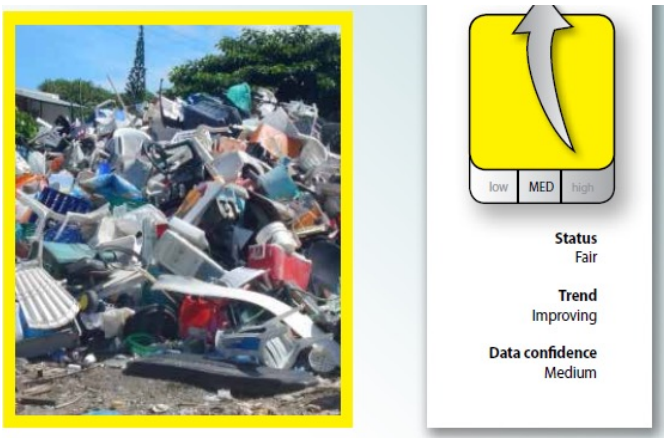


Fig. 19: Solid and hazardous waste status and trend showing

Management of solid waste is improving since concerted efforts were put in place from 2007 (Fig. 19). Recent figures collated in 2011 indicated that 58% of waste is taken to landfill with the rest being dumped into pits, burnt, composted or dumped at sea. Collection of waste takes place only on the two main centers of Majuro and Ebeye, but even then it doesn't

cover all of the households. Residents on the Laura side of the island transport their own waste to the landfill or dispose of it by burying and burning. A total of 668 illegal or unauthorized dumpsites were recorded in 2011. Unregulated dumpsites are putting more pressure on the surrounding areas which leads to other social, environmental and health issues.

Type of Waste	Volume of Waste (%)
Paper	26.32
Green Waste	20.79
Synthetic Resin/Plastic	20.22
Metals	11.95
Disposable Diaper	5.60
Kitchen Garbage	4.70
Textile/Clothes	4.19
Glass/Ceramic/Coral/Shell	4.14
Leather/Rubber	0.36
Miscellaneous	1.72

Fig. 20: Types of waste and volume generated

Managing the landfill and the waste is very expensive. Operations are funded by commercial collection and recycling activities (14%) with the remainder of the funds subsidised by the Compact arrangement, bilateral and other outside donors (86%). The projections for operational costs were to increase by 40% due to the costs of a new landfill. The increase in waste generation is influenced by increased population in Majuro and changes in the consumption of goods. It is estimated that about 1kg of waste is generated by individual on a daily basis (See Fig. 20 for a breakdown of waste types). This rate is considerably higher when compared to other urban areas in the Pacific. More inorganic goods are entering the country, without an increase in recycling options. The landfill has also reached its carrying capacity in 2011, but the continuing use makes it the highest elevation in RMI. This has also put stress on the retaining wall therefore making it vulnerable to sea water incursion. A big proportion of the waste is organic or compostable waste (cardboard, paper, green waste and kitchen waste).

The impact of this issue includes the leaching of pollutants into the surrounding land, sea and ground-water. It also contributes to greenhouse gas emissions due to waste decomposition. Furthermore it attracts disease ridden animals and therefore a source for diseases to the surrounding population.

Hazardous wastes encompass a wide variety and types of material including e-waste (electronic), white goods, medical, asbestos, batteries and household items (paints, pesticides and chemicals). Most of the hazardous wastes are collected as general waste and taken to Majuro landfill. However, there is still a lot not known on the fate of hazardous waste but it is suspected that most are being illegally dumped. Medical wastes are incinerated with the ash buried in multiple cement lined pits. There has been an influx in e-wastes due to high importation of electronic goods. Most are illegally dumped in private property or in the general waste. Another important hazardous wastes include radioactive nuclear wastes that was a legacy of World War 2 (see Case Study 4).

Case Study 4

Eat at your peril

A study to determine if the concentrations of metals, pesticides and polychlorinated biphenyls (PCBs) pose an unacceptable risk to humans who consume fish from islets in the southern portion of Kwajalein Atoll found:

- Contaminant concentrations were higher in fish/water collected from Kwajalein Habor
- Concentrations of PCBs and pesticides in fish tissue exceed available screening guidelines for the protection of human health
- Fish ingestion poses unacceptable cancer risk to Marshallese who fish from Kwajalein and Meck harbors
- Contaminant concentrations in lagoon reef fish may adversely affect public health, the marine environment, and protected beneficial uses of surface waters

Study recommended a continuing banned in taking fish from Kwajalein harbour, and the ban to extend to Meck and Illeginni harbors.

Study further recommend halting any discharge of contaminants into the sea.

3.6 Loss of traditional conservation practices

Traditional conservation practices, governed by *Iroij* (chiefs), were designed to protect and manage natural resources in order to secure reliable food supplies. The erosion of traditional resource management has negative implications for biodiversity in the Marshall Islands. Today many of the *iroij* no longer live on the atolls they represent, and few atoll communities have living memory of traditional taboo or *mo*. In some cases, the loss of knowledge, absence of the *iroij* and a lack of enforcement of traditional practices has led to unchecked harvesting of marine resources.

4.0 Impact of the changes in biodiversity for ecosystem services and the socio-economic and cultural aspects of these impacts.

Changes in biodiversity can have a serious impact on ecosystem services, socio-economic and cultural aspects for the people of RMI, who are dependent on 70% of their daily nutrition from inshore and coral reef species. The following impacts are identified.

- Loss of inshore and coral reefs and reef biodiversity will directly affect the availability of essential food to the people.

These losses can be caused by:

- Habitat destruction from coastal development
- Overfishing and non-regulation of the subsistence fishery
- Use of destructive fishing methods
- Coral and sand mining
- Pollution, especially in urban and highly populated areas
- Dredging and construction of causeways
- Presence of invasive species
- Climate variability, including sea level rise, coral bleaching caused by increase in sea surface temperature, increasing ocean acidity
- Increase in intensity and frequency of typhoons

Loss of terrestrial resources such as forests and marshlands will reduce already limited areas available for agroforestry. These losses are exacerbated by:

- Urbanization and habitat destruction
- Poor waste disposal and waste management
- Damage from typhoons
- Flooding caused by sea level rise

Loss of iconic species including endemic species can result in loss of cultural aspects of life such as:

- Loss of the Mule
- Reductions in turtle numbers
- Reductions or loss of Giant clam species

- Reductions in key predators such as sharks
- Depletion of important fish stocks such as Bigeye Tuna or other tuna species through over-fishing. This will result if major losses of income over the longer-term.
- Increasing scarcity of the Whale Shark

In terms of social and lifestyle changes, there will be a shift in nutritional uptake as people relies more on imported goods. This can lead to health issues, and is exacerbated by the land becoming less usable for physical activities due to sea level rise, waste including radioactive wastes.

Mitigating measures are well in motion including the Reimaanlok National Plan for conservation, specific plans for protection of forests, coral reefs and iconic species such as turtles, sharks, and Mules.

PART 2. The national biodiversity strategy and action plan, its implementation, and the mainstreaming of biodiversity

5.0 Republic of the Marshall Islands Biodiversity Targets

RMI completed its first national biodiversity strategy and action plan in 2000. It submitted two national reports to the CBD Secretariat (https://www.cbd.int/reports/). This report provides an update of the current status of biodiversity and ecosystem services of RMI and highlight achievements and activities to align national goals with the global strategic plan and the Aichi Targets

Since the development and endorsement of the NBSAP in 2000, RMI embarked on the development of its national conservation area plan or Reimaanlok. The Reimaanlok builds on the NBSAP process providing the overarching framework for conservation area planning in the country. It recognizes the good will of the government, communities and civil society towards establishing conservation areas for the protection of biodiversity, as well as for the use by the people. Reimaanlok also became a key instrument for RMI's response towards its commitment to the Micronesian Challenge. A regional review of NBSAPs in the Pacific was undertaken in 2007, which included RMI. The review noted the lack of targets and indicators in many of the countries' NBSAPs including RMI (Carter 2007). RMI's current NBSAP contains 16 goals and 46 actions. Although these goals and actions are broad, they provide guidance for the government sectors and national stakeholders to engage with their implementation.

In 2006, RMI endorsed ambitious regional targets through the Micronesia Challenge including establishing 20% of terrestrial and 30% of nearshore marine resources for effective conservation by the year 2020. It has further developed national targets under the Reimaanlok

Fine scale conservation targets/ special features	Type 1 Goal	Type 2 Goal	Percentage under conservation
Terrestrial			
Bird Island	100%	50%	41%
Breadfruit forest mā	100%	0%	
Climax forest communities: kanal and kōjbar	20%	10%	
Mangrove area	90%		25%
Permphis acidula forest	100%	50%	
Pond	60-80%	-	
Shrubland and grassland	100%	50%	
Turtle nesting beach	100%	100%	27%
Windward forest	100%	-	
Marine			
Clam site	50%	30%	
Fish spawning aggregation area	100%	-	
Point with extended ocean reef bōke	30%	-	
Reef hole nam	30%	-	
Seagrass meadow	100%	-	

Table 4: Conservation goals for fine scale conservation targets

2008 – A Blueprint for national conservation in Marshall Islands, identifying two types of conservation areas (see Fig. 21) and the resolution of conservation targets (see Fig. 22).

The national targets illustrated in tables 4 and 5 show that RMI is well on its way to meeting and exceeding the Aichi Target 11. Refining the resolution for protected areas to coarse, fine and species scale helps in ensuring effective management strategies are used utilized to target specific conservation outcomes.

Local conservation efforts are also in place for the conservation of threatened species to ensure of their survival. The Micronesia pigeon or Mule is one example (see Case Study 4; Fig. 23) where only a few breeding pairs found in a 2007 were protected and allowed to recover to over 80 individuals two years later.

Coarse scale Conservation Targets / environmental units	Type 1 Goal	Type 2 Goal	Total Area (km^2)	Existing conservation areas (% of total)
Terrestrial (Land)			**181.9**	16%
Agroforests	50%	-		
Indigenous broadleaf forests	80%	10%		
Wetlands	80%	-		
Marine (Nearshore Marine)			**14066.6**	18%
Deep lagoon	30%	0-5%	10239.7	17%
Lagoon pinnacles	30-40%	0-15%	77.8	
Lagoon slope	50%	0-15%	1120.4	23%
Ocean leeward reef liklal	30-50%	0-10%	627.3	17%
Ocean reef	100%	-		
Ocean seabed	-	-		
Ocean windward reef	30-50%	0-10%		
Pelagic system	-	-		
Reef flat	30-50%	0-10%	1354.6	23%
Reef pass and channel	80-100%	0-30%	646.7	21%

Table 5: Conservation goals for coarse-scale conservation targets

Type I – Subsistence Only. This area is managed for subsistence non-commercial use. In international standards this relates to IUCN Category VI – Managed Resource Protected Area. The management area may include some Type II – Special Reserve no-take or highly restricted areas as part of the management regime.

Type II – Special Reserve. This area is subject to a high level protection, and occasionally a very low level of subsistence or special occasion activities. In international standards, this relates to IUCN Category Ib – Wilderness Area. Examples of this are the atolls of Ailinginae and Bikini that have high levels of protection and restrictions on human activities.

Fig. 21: Conservation area types

a. Coarse-scale conservation targets: broad categorization of habitats and ecosystems that encompass all the biota of the Marshall Islands.

b. Fine-scale conservation targets: important areas for species targets, rare or imperiled communities, places of cultural significance.

c. Species conservation targets: threatened species, endemic/restricted range, flagship species, species of cultural significance and species of economic importance.

Fig. 22: Conservation targets scale

6.0 NBSAP targets and biodiversity mainstreaming

A number of existing plans and initiatives addresse components of the Aichi Targets, especially the national conservation areas plan or Reimaanlok. See Appendix 3 for more information on RMI's response to the Aichi Targets. Examples of responses by RMI include the participation of community and developing financial arrangements. This is in line with the Aichi target 20 (resource mobilization) and targets 17 and 18 (community participation). Aichi target 1 on awareness raising is included as a key activity of local officers working with communities on threatened species. In addition, education and awareness are being built into the community-based fisheries and resource management planning including the RARE Pride campaign (utilization of charismatic flagship species to build local pride) and Just Act Natural (raising awareness on cultural and natural heritage through theatre).

Case Study 4

Mule - the Ratak Micronesian Pigeon

Management plans are yet to be put in place for a number of species e.g. Ratak Micronesian Pigeon or known locally as Mule (*Ducula oceanica ratakensis*), which is extinct in other atolls. One other endemic land bird was the Wake rail (*Gallirallus wakensis*) which became extinct from Wake and Wilkes atolls shortly after World War 2. In 2006, the Marshall Islands Conservation Society (MICS) initiated a project to restore the Mule population. The Mule plays a vital role in distributing the seeds of the Mejwan (seeded breadfruit tree). The population of Mule declined to just eight breeding pairs due to the loss of habitat (removal of native trees), human activity and predators (mainly rats and cats). The Mule campaign made significant progress in population recovery where 80 birds were recorded two years after the campaign. The restoration of their natural habit and community awareness campaigns made a big difference with the numbers of Mule increasing.

It is highly recommended that conservation and management plans are prioritized for these threatened species. It is highly recommended that traditional knowledge on biodiversity is taught in the schools. By doing so, the traditional knowledge and practice of conserving the natural surroundings can be revived to help preserve the Marshallese traditions and heritage.

Fig. 23: Ratak Micronesian Pigeon

The establishment of the **Coastal Management Advisory Council** in 2006 is one of the strongest mainstreaming tool employed by RMI, whereby a cross-sectoral working group of people from a range of organizations, all with a common interest in the conservation, development and management of coastal and marine resources. CMAC as the name suggests, is an advisory and coordination body, with activities carried out under the member organizations. This ensures that resources are maximized and that everyone is aware of who's working where and with what community. Members of CMAC include:

- Marshall Islands Marine Resources Authority
- RMI Environmental Protection Agency

- College of the Marshall Islands
- Marshall Islands Visitors Authority
- Office of Environmental Planning and Policy Coordination
- Marshall Islands Conservation Society
- Natural Resources Assessments Surveys Marshall Islands

Core roles of these organisations are provided in Fig. 25. Other organizations will be added as part of the ongoing engagement process.

One of the components under the CBD is the use of living modified organisms (LMOs), which is also covered under international agreement such as the International Treaty on Plant Genetic Resources and importantly the Cartagena Protocol. A comprehensive legislative review of this issue in Marshall Islands found many deficiencies, but provided some clear recommendations on how this could be addressed with the existing national framework. The review recommended the development of a National Biosafety Framework with several components including a coherent government policy, regulatory regime, permitting system, monitoring and enforcement regime and a public awareness, education and participation programme. The review highlighted the importance of working with other sectors including public health, agriculture, biosecurity, customs, legal and fisheries. A cross-sector framework was further recommended as a mean of overseeing biosafety development in RMI. This included the central role being spearheaded by the Quarantines Research & Development section, with oversight by the Environment Protection Authority, MIMRA and OEPPC. Hence a working group should be established with support from cabinet.

7.0 Actions taken to implement CBD and outcomes

The RMI government has instituted a number of important conservation measures that fall within its obligations and commitments to CBD. These measures can broadly be categorized in the following – policy level actions, legislative and regulatory framework, strategies and action plans, conservation implementation, and resource mobilization.

7.1 Legislative & regulatory framework

In 2011 RMI made a bold move by declaring the whole of its exclusive economic zone (EEZ) as a shark sanctuary. This places a ban on all activities associated with harvesting sharks (shark finning and possession of shark fins and body parts) for commercial purposes. Prior to this declaration, about 183-250 metric tons of sharks were caught annually from 2005 to 2011. Even the iconic Whale shark (*Rhincodon typus*) listed as vulnerable under the IUCN Red List was occasionally caught in fishing nets from purse seiners. After the declaration no shark catch was recorded in 2012. RMI's shark conservation effort is echoed by the rest of Micronesia provide a safe-haven for sharks in the region.

The passing of the **protected area network** (PAN) legislation in 2015 allows protected area managers to join the national network, which allows them to access funding from the RMI's Micronesia Challenge Endowment Fund. A further commitment by the government to establish its own PAN Fund with additional sources of local funds (e.g. through fisheries fees, visitor fees, etc.).

RMI has joined forces with other Micronesian countries in building its capacity through **Conservation Enforcement Alliance** training supported by MCT, PIMPAC, the Pew Charitable Trusts and the Nature Conservancy. This is a critical gap and a priority action under the RMI's NBSAP.

7.2 Strategies and action plans

Another significant milestone for RMI is the development of its **national blueprint for conservation or the Reimaanlok – the national conservation area plan.** Reimaanlok presents a clear roadmap of the way forward for conservation in RMI. The blueprint provides a strategic guide towards addressing the ambitious targets of the Micronesia Challenge. It outlines the principles, process and guidelines for the design, establishment and management of conservation areas that are fully owned, led and endorsed by local communities based on their needs, values and cultural heritage.

The **revitalization of 'Mo'** the traditional tool used for conservation of resources has given additional mana to modern conservation efforts by recognizing the value and role of iroji (chiefs) in community affairs. This has made it possible to gain traction for establish community based conservation areas.

Atoll	MMA Sites	Management type	Km^2
Ailuk	6	Subsistence with a Whole Atoll management plan in place.	24.08
Rongelap	Whole atoll	Subsistence only	2787.48
Ailinginae	Whole atoll	Special Reserve – No take	1024.74
Bikini	Whole atoll	Special Reserve – No take	2032.87
Arno	16	4 No Take, 12 Subsistence with a management plan in place	62.25
Jaluit	21	14 No Take, 7 Subsistence with a conservation plan in place (Ramsar site)	127.4
Rongerik	Whole atoll	Special Reserve – No take	1002.38
Kwajalein	2	Special Reserve – No take with management plan in place	7.77
Mili	3	Not specified - traditional Mo	96.10
Namdrik	1	Not stated, with management plan (Ramsar Site)	16.19
Likiep	2	Management Plan	0.31
Majuro	5	Special Reserve – No take with different management plans	2.59
Wotje	Whole atoll	Special Reserve – No take	624
Erikub	Whole atoll	Traditional Mo Site, important turtle nesting ground, control by Paramount chief (Iroijlaplap Remios Hermios)	230

Table 6: Marine managed sites in RMI

The development and update of the State of Environment report 2016 provides RMI a clear framework in achieving sustainable development through addressing key drivers for biodiversity loss, threats and environmental degradation. The recommendations contained under each of the drivers provide practical guidance for RMI and stakeholders in order to secure their future and achieve their vision.

Marshall Islands now has in place a National Invasive Species Strategy and Action Plan (NISSAP) 2016 - 2021 which was developed as an output of the GEFPAS regional invasive species project. NISSAP's overarching goal is to conserve and protect biodiversity, food security, livelihoods, health, sustainable development, economics and resilience to climate change by preventing the introduction of new alien invasive species to the contry, limiting further spread of invasive species within the country and managing existing invasive species including eradication when feasible. The NISSAP also aims at ensuring that Marshall Islands responds to, and contribute to the achievement of the Aichi Target 9.

7.3 Conservation implementation

RMI places high priority on marine conservation areas, with about 70% (or over 8,000 km^2) of the reef being conserved. The number of marine managed areas is considerable (Table 6) and includes various types of land and seascapes. Of these, 57 are specified areas within the atolls, and six are whole atoll marine managed areas: Bikini, Ailinginae, Rongelap, Rongerik, Wotje, and Erikub atolls.

Terrestrial protected areas is currently estimated at 15% of land area. A total of 36 terrestrial protected areas on 13 atolls, of which six are listed as whole-atoll protected areas, whereas the other seven have specified protected sites. RMI continues to make good progress towards achieving it's commitment under the Micronesia Challenge (20% target), whereas it has exceeded the Aichi Target.

There are plans and guidelines that cover 89% of marine managed areas. They range from fisheries and resources management plans, atoll conservation plans, and coastal zone management plans (the exception is Bikini Atoll which is a World Heritage site). Two plans are being developed for Ene Kalamur and Bokanbotin on Majuro, while Woja Conservation Area is developing an Alternative Livelihoods program. The management of the marine managed areas is overseen by local governments and/ or Local Resources Committees, with technical support provided by CMAC.

7.4 Knowledge development

MPA management effectiveness studies have been undertaken in several sites – Ailuk, Jaluit, Namdrik, Anenuaan on Likiep, and Woja Conservation Area and Bikirin on Majuro. Similar studies are being developed for Enekalamur and Bokanbotin, also on Majuro.

7.5 Resource mobilization

The RMI government has made a number of financial commitments and undertakings to invest more in the protection and conservation of its biodiversity and environment. This included investing into the Micronesia Challenge Endowment Fund, which provides grants to communities in RMI and Micronesia for conservation work. The Global Environment Facility remains a key source of funding for conservation work in the Marshall Islands which has assisted in developing the first NBSAP for RMI including the NISSAP which was developed under GEF-4. A Ridge to Reef GEF funded project is being developed to implement the Reimaanlok National Conservation Area Plan for the Marshall Islands. RMI has also committed a significant proportion of its GEF 6 allocation towards addressing invasive species, one of the main threats to biodiversity. The Micronesia Conservation Trust provides financial support to the Micronesia Challenge by supporting member countries including RMI in fund raising, investing, disbursing and managing the Micronesia Challenge endowment fund. A recent partnership between MCT and the National Oceanic and Atmospheric Administration (NOAA) sees surveys of coral reefs and fish community as efforts to build network of MPAs and strengthen local management capacity to improve and maintain resilience of ecosystems.

8.0 Mainstreaming of biodiversity into relevant sectors

The RMI's Strategic Development Plan (SDP) Framework 2003-2018 provides an overarching perspective towards sustainable development for the country. The document was developed following extensive consultation starting with a national economic and social summit and extended deliberations by various working committees established by the Cabinet. The process of implementation of the SDP framework is two-fold starting with developing master plans focusing on major policy areas, and action plans for Ministries and Statutory agencies. The action planning will be rolled out to include all atoll local governments using the overall SDP framework as a guide. The master plans will cover a range of sectors including human resources development, outer islands development, culture and traditions, environment, resources and development, information technology, private sector development, infrastructure and tourism. Environmental sustainability is one of the 10 strategic goals for the country under the SDP framework (Fig. 24). The Environmental Sustainability aligns closely with the goals and objectives of RMI's NBSAP.

Goal 10: Environmental Sustainability

(i) Developing a regulatory system that can be enforced with a high degree of compliance at all levels, in order to achieve the sustainable development of our natural resources, while protecting our environment from any adverse impacts; and

(ii) Strengthening the relevant institutions and improve procedural mechanisms, so as to be able to secure the optimum support from both international and regional efforts, in minimizing the adverse impact of climate change.

Fig. 24: Environmental sustainability

An important threat and an opportunity to mainstream biodiversity through the various sectors is presented by concerns over climate change impacts. There is no denying that climate change will adversely impact the lives of the people, as well as the resources needed to sustain their well-being. Part of the country's response to climate change is developing contingency and adaptation plan, as well as securing the involvement of elected and traditional leaders in climate change country team (CCCT). A nationwide education program will be carried out to educate people including the private sector about climate change, sea level rise and ozone depletion and atoll environment. These are also milestones under the Marshall Islands commitment and progress towards the Millennium Development Goals (Goal 7 – Target 9). Efforts will be strengthened to minimize environmental degradation and to harmonize development efforts with environmental protection. This includes strengthening institutions such as the EPA, HOP and other regulatory authorities, as well as laws, regulations and procedures. Greater coordination and collaborative action among all relevant regulatory agencies in Government is also advocated. In addition, the government will implement policies and programs to ensure greater compliance to environmental protection laws and regulations from the private sector and the general public. Intensive public education and awareness programs and campaigns will be implemented and strict adherence to environmental impact assessments for all aid donors. Development of a national waste management plan will provide for the better management of wastes in communities and in urban areas. Education curriculum will also include environmental studies.

Underpinning the mainstreaming efforts is the need to address barriers that have been voiced through various reports, consultations and conversations. Some of the barriers are articulated in the SDP framework:

- Help ourselves first
- Change in attitudes and behavior at all levels of society

- Build capacity and commit to the principles of transparency and accountability
- Promote innovation and competency
- Rebuild on the lessons from our culture and traditions where environmental sustainability has always been a major consideration in the lives of atoll communities.

9.0 NBSAP implementation progress

RMI is proud to have made considerable progress towards the implementation of its NBSAP. Almost all of the 16 goals and 46 actions have been implemented, although a concerted national effort is needed to collate the outcomes and achievements. It is also pleasing to note that since the NBSAP was developed, many of its goals and activities align well with the new Strategic Biodiversity Plan as well as the Aichi Biodiversity Targets as outlined in Table 7.

NBSAP themes	Relevant Aichi Biodiversity Targets
Awareness raising	Target 1
Traditional knowledge	Target 18
Legislative review and national consultation	Target 17
Resource management	Targets 1-4, 6, 7, 10-20
Enforcement	Target 3
Engagement of civil society and other local and national actors	Target 17
Agro-biodiversity	Targets 7, 13
Food security and adaptation	Targets 13, 16
Capacity building	Target 19
Education	Target 19
Research and knowledge management	Target 19
Solid waste management [Aichi Target 8]	Target 8
Intellectual property rights [Aichi Target 16]	Target 16
Biosafety	Targets 3, 13, 16

Table 7. NBSAP and Aichi Targets

In terms of progress towards the implementation of the NBSAP, a number of achievements can be demonstrated (see below). Many of the activities undertaken by the various government ministries, community groups and civil society have been carried out without explicit linkage to the NBSAP.

- **Goal A1 – Activate traditional 'Mo' Conservation Site.**

Key activities under this goal include raising awareness especially targeting youth and outer communities, documenting the knowledge around this traditional practice (e.g. relationship between 'mo' and sustainable use of natural resources, as well as the land tenure), strengthening national institutions such as the Alele Museum and national legislation to allow for the declaration of 'mo' or conservation areas. The RMI Strategic Development Plan 2003-2018 (Goal 10: Objective 5) – Environmental Sustainability provides support to the NBSAP Goal by advocating the new for a strong regulatory system to protect the environment. Additional progress on this goal is through the

establishment of the Coastal Management Advisory Council and the development of a strategic plan. Conservation sites began to increase including the declaration of Jaluit Atoll Conservation Area as a Ramsar site in 2004, the declaration of Ailinginae, Rongelap and Rongerik as protected areas under local government ordinances. Management plans were developed for areas such as Likiep and Arno atolls, Mili Conservation Area and Ailuk Atoll.

- **Goal A2 – Imposition of fines and penalties on those who destroy our resources**

Key actions include revisions of national legislation and local government ordinances in order to amalgamate traditional and current practices, review the adequacy of fines and penalties, review resources and build capacity to support the implementation of these actions. A review of the national legislation was undertaken during the development of the Reimaanlok. The review recommended a national level legislation that provides for the establishment and management of conservation areas but which is not unnecessarily demanding or prescriptive. The provisions within this legislation should allow for soft-policy, local law and subsidiary regulations to develop detailed processes and management regimes for conservation areas. These soft policy, local law and subsidiary regulations should remain flexible and be allowed to evolve.

National Resource Management and Conservation Organizations

Marshall Islands Marine Resources Authority (MIMRA)

As the national agency responsible for marine resources, MIMRA actively engages with local governments and communities to facilitate the development of community-based management plans. MIMRA has broad legislated powers regarding marine resources and is able to further support local-level resource management through the delegation of legal powers and through the declaration of marine parks and marine reserves.

Republic of the Marshall Islands Environment Protection Authority (RMIEPA)

RMIEPA has also led the development of community-based resource management and conservation plans, especially on Jaluit and Mejatto. At the moment, as the Ramsar focal point, the RMIEPA is focused on assisting atolls to establish conservation areas around wetlands, and more specifically, mangroves.

College of the Marshall Islands (CMI)

The Marine Science Department of CMI contributes greatly to overall conservation efforts in the Marshalls through hosting scientists and research programs, providing technical support to facilitators working with communities, development of a marine park officer training program, assisting with resource assessment and biological surveys, contributing to the coordination of CMAC, developing grant proposals and providing community outreach activities such as development of education and awareness materials.

Marshall Islands Visitors Authority (MIVA)

The Marshall Islands Visitors Authority can assist conservation by promoting the benefits of conservation tourism to communities, and by promoting the stunning natural environment of the Marshalls to tourists and the tourism industry.

Office of Environmental Policy and Planning Coordination (OEPPC)

OEPPC is the nationally-appointed focal point for the CBD, the Micronesia Challenge and for other biodiversity-related international funding sources such as the Pacific Regional Environment Program (SPREP) and the US Coral Reef Task Force. The role of this office is important in facilitating access to funding and technical assistance from these organizations for the implementing agencies above.

Marshall Islands Conservation Society (MICS)

The recently-established MICS is developing strength as a key partner to RMIEPA and MIMRA to assist in the facilitation and development of management plans with communities, and with carrying out education and awareness programs on conservation.

Ministry of Resources & Development (R&D)

As the national agency responsible for agriculture and forests, R&D works with communities to maintain and protect these human-managed ecosystems and their associated biodiversity.

Natural Resources Assessments Surveys Marshall Islands (NRAS)

NRAS Conservation is an NGO dedicated to the conservation of tropical marine ecosystems in the Pacific. NRAS Conservation assists with resource assessment, resource monitoring, conservation planning, training, and capacity building to communities to sustainably manage their marine natural resources.

Fig. 25: Agencies within CMAC and their roles

- **Goal A3 – People taking the initiatives in planting trees and crops**

Three activities under this strategic goal focusing on enhancing agro-biodiversity and forestry biodiversity through engagement of youth and communities and improving understanding of indigenous crop species and farming systems. A number of biological surveys have been carried out in various atolls in RMI including surveys in Jaluit in 2000, Likiep in 2001, Ailinginae and Bikini in 2002, Mili, Likiep, Ailinginae and Rongelap in 2003, Namu and Majuro in 2004 and Ailuk in 2006, with the specific purpose of helping to identify areas of biodiversity significance for the establishment of conservation areas. Furthermore, Government has also undertaken research and development and action plan (2005-2010)

and the RMI state wide assessment and resource strategy (2010-2015). These documents are available from the US Forest Service website.

- **Goal B1 – Training and capacity building toward conserving our resources**

Activities including incorporating principles of sustainable resource management based on traditional and modern knowledge into education system. Encouraging more students to study resource management and provide scholarship to support this. Provide in-house training for government staff and decision makers in resource management and to roll this out to community. Progress of this goal includes the establishment of an Education and Awareness Division under the Environment Protection Agency (EPA). This Division is working with atoll local governments, donor agencies, government ministries and the University of the South Pacific to include resource management into educational curriculum. The main responsibility of the Division is to increase public awareness and understanding at national and local levels and to relay environmental issues and activities of the EPA to schools and the general public. More information on this work can be found on https://www.facebook.com/rmiepa.outreach/. Environmental education has also been developed by MIMRA including turtles and reusable bag campaign. Legislation for the protection of resources include the marine turtle legislation.

- **Goal B2 – Sustainable fishing practices**

Three key activities that are also cross-cutting with other strategic goals include research, awareness and legislative review. Progress made under this strategic goal is included in the other goals and activities.

- **Goal C1 – Apply traditional skills knowledge**

Activities include supporting capacity building on canoe-making and handicrafts, especially the work of non-governmental organisations, revise legislation and promote the benefits of using local products. Considerable progress has been made with regards to legislative review (refer to Reimaanlok), as well as progress in promoting traditional knowledge.

- **Goal C2 – Institute learning of the culture through the traditional way of passing knowledge from elders to the young, through schools, community meetings and workshops**

Two activities include strengthening of school curriculum through the use of traditional elders and support of NGOs. Progress in this area has been made through the implementation of other activities of the NBSAP.

- **Goal C3 – A move toward more use of local products**

The two activities focus on research for effective use of local materials and strengthening of governments initiatives to promote the use of local products. The goal and actions are similarly addressed under Goals D1 and E1.

- **Goal D1 – Self-reliance through traditional values and culture**

The three activities are cross-cutting in nature focusing on public awareness, strengthening government policies and research to promote understanding of traditional knowledge. There is a link to other goals and actions focusing on discouraging dependency on imported goods. The need to combine traditional knowledge with modern ideas is also an important consideration of this goal, which ties in with actions and goals (Goals C3, D4 and E1). The avenue to implement this goal is presented through the CMAC as well as other national initiatives.

- **Goal D2 – Population awareness**

One of the interesting challenges for the country is managing population growth and associated social issues such as employment and urban migration. Under this goal there is a clear need for providing adequate resources to support the implementation of the activities. RMI continues to work with the private sector and development partners to address this challenge.

- **Goal D3 – Working cooperatively and justly with one another**

There was no activity identified for this goal, given that this is how business is done in RMI. However, the establishment of the Coastal Management Advisory Committee (CMAC) is an example of what Goal D3 aims at achieving particularly where different organizations and people work together cooperatively and collaboratively for a common purpose.

- **Goal D4 – Cleanup the Environment**

Activities include education and awareness to encourage people to reduce their reliance on imported products that produce excess waste, improve solid waste management, instituting government policy on wastes from imported goods, improve legislative framework and promote reduce, reuse and recycle to public and private sectors. There has been an enormous effort to address solid and other wastes, as well as recycling in RMI. The effort is being challenged by the enormity of wastes being generated especially in urban areas. About two-thirds of the waste makes it to the landfill with the remainder still being dumped in the ocean, backyard pits or burned. Recycling at landfill stations is lacking. Policies and legislative framework have been developed providing the blue-print for dealing with this challenge.

- **Goal E1 – Conservation of genetic diversity**

Documenting traditional knowledge on species (plants, animals and terrestrial, marine) by working with elders and explore scientific potential of these species for the benefit of the community. Additionally to establish in situ and ex situ gene banks for species from RMI. Revitalizing and valuing traditional knowledge has been a key ingredient for the conservation area plan blueprint (Reimaanlok) whereby 'mo' is an important consideration for new conservation areas. Scientific studies and surveys are continuing and the potential to explore scientific value of RIM's genetic resources remains on the card. Ex situ conservation of important crops for RMI is part of a regional gene bank being stored at the Plant and Genetic Resources unit with the Secretariat of the Pacific Community (SPC) in Suva.

- **Goal F1 – To have in place legislation and regulatory framework for biosafety**

The two activities include reviewing and revising of the existing legislation on biosafety taking into account provisions for the importation of genetically modified organisms (GMOs), controls over field testing, labelling and provisions for environmental and social-impact assessments. Part of the review is to strengthen enforcement procedures for infringement. A review of the biosafety framework has been completed and key recommendations have been proposed. This included the need to establish a multi-agency working group to oversee the development and implementation of a national biosafety framework.

- **Goal F2 – Establish systems to implement new or revise legislation and regulation of biosafety**

The main activities under this strategic goal include the delegation of the various provisions of biosafety to different ministers and agencies, ensuring adequate capacity to provide risk assessment, risk management, environmental impact assessment and social-impact assessments. Awareness raising is also a critical part of this goal, especially targeting political leaders, government officials and the private sector. Funding for the biosafety systems through user-pay charges or through government support is advocated for. Finally, strengthen ties with national and regional organisations to provide the technical backstop on biosafety for the country.

PART 3: Progress towards the 2020 Aichi Biodiversity Targets and contributions to the 2015 MDG targets

10.0 Progress made towards implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets.

On the ground biodiversity and conservation activities are steadily progressing towards addressing the global Strategic Plan for Biodiversity and the Aichi Targets. These activities can be summarized through various processes such as legislative review, policy development, capacity building, awareness raising, designation of conservation areas and mainstreaming biodiversity through national development plans. Further details of progress can be found in Appendix III.

11.0 Implementing the Convention towards achieving the relevant 2015 MDGs

RMI's progress towards the relevant MDGs has been mixed. Great progress has been made with regards to provision of safe drinking water for the population (Target 7C); good progress towards reducing biodiversity loss (Target 7B); steady to somewhat slow progress in mainstreaming sustainable development principles and practices into planning and development processes; serious deficiency in addressing sanitation for communities (Target 7C); and concerns with high population densities in Majuro and Ebeye with adverse socio-economic impacts (Target 7D). RMI is now looking towards addressing the new 17 goals under the 2030 Agenda for Sustainable Development.

12.0 Lessons learned from the implementation of the Convention in Marshall Islands

RMI held a national stock-taking workshop in 2007 to consider lessons learned from past conservation activities. The outcome highlighted a need for an over-arching resource management framework that addresses fisheries, conservation and coastal zone management. It also noted the need for a multi-agency approach to be used the development of the atoll management plan. The underlying principles of this process are that resource management must be community-driven, while being supported with resources and expertise from national agencies. The Reimaanlok was the product of the national stock-take workshop as is the CMAC. Under the Reimaanlok an eight step process was developed as part of the lessons learned towards developing conservation and fisheries management development.

1. Initiation – *a need to develop a community-based resource management plan is identified either at the local government level or at the national level*
2. Project Scoping and Setup – *establishment of a project workplan, a team of facilitators and identification of budget and resources*
3. Building Commitment – *an initial visit is made by the national team to carry out education and awareness about the benefits of conservation and resource management, and to build trust with community*
4. Collective & Managing Information – *further visits focus on collection and documentation of local knowledge and use of resources, socio-economic information and baseline scientific information*
5. Developing the Management Plan – *several visits are made to the community to develop, draft and revise a detailed management plan*
6. Sign Off – *achieve commitment to the plan through sign-off of management plan*
7. Monitoring, Evaluation and Adaptive Management – *monitor achievement of the objectives – both biological and socio-economic. Adapt the management plan accordingly*
8. Maintaining Commitment – *ensure community has adequate support for ongoing management*

Another important consideration from the perspective of RMI in relations to the implementation of the Convention is noted in the 2000 NBSAP, as well as iterated in the regional review of NBSAP in 2007, is economic and financial. Funding remains a serious challenge and an obstacle for the implementation of many of the activities and Convention commitments. The commitment by the government in supporting the Micronesia Conservation Endowment fund goes in some way to addressing the financial challenge. There are some unknown implications when the Compact Agreement comes to an end. The

establishment of the multi-agency Coastal Management Advisory Council provides the mechanism to coordinate conservation efforts in RMI.

Appendix I. Reporting Information

The 5th National Report is based on a consultative process undertaken through the development of two key government initiatives – the National Blueprint for Conservation Areas Plan and the State of Environment Report. The consultation includes workshops and interviews with a wide-range of stakeholders and communities, as well as the private sector and the scientific community. Many of the historical case-studies, reports and literature were reviewed and incorporated in this report.

This report provides a summary of the current state of biodiversity and conservation in RMI. For a complete and comprehensive analysis, it is recommended that the State of Environment and Reimaanlok reports should be consulted.

Appendix II. Further sources of information

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