A photograph of a boat on the water at sunset or sunrise. The sky is a mix of dark blue, orange, and yellow. The boat is in the lower middle of the frame, and the water is dark with some reflections.

# Reimaanlok

Looking to the Future

National Conservation Area Plan for the  
**Marshall Islands**

May 2008

*This Project was undertaken with funding from the Australian Government through the Regional Natural Heritage Programme.*

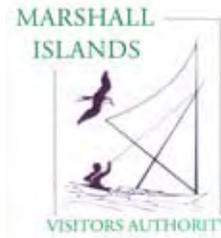


**Australian Government**  
**Department of the Environment,  
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COORDINATION



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## Abbreviations

CBD	Convention on Biological Diversity
CI	Conservation International
CMAC	Coastal Management Advisory Council
CMI	College of the Marshall Islands
EEZ	Exclusive economic zone
GIS	Geographic information system
ICEM	International Centre for Environmental Management
MICS	Marshall Islands Conservation Society
MIMRA	Marshall Islands Marine Resources Authority
MIVA	Marshall Islands Visitors Authority
NGO	Non-governmental organization
NRAS	Natural Resource Assessment Surveys (Marshall Islands)
OEPPC	Office of Environmental Policy and Planning Coordination (Marshall Islands)
PIMPAC	Pacific Islands Marine Protected Areas Community
R&D	Marshall Islands Ministry of Resources and Development
RMIEPA	Republic of the Marshall Islands Environment Protection Authority
RNHP	Australian Government Regional Natural Heritage Programme
SPREP	Pacific Regional Environment Program
TNC	The Nature Conservancy
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Program
USP	University of the South Pacific
WH	World Heritage Convention

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# Foreword

Global biodiversity loss is rapid and ongoing. International efforts are redoubling as the international community realizes the importance of biodiversity in maintaining our life support systems. In 2004 Parties to the Convention on Biological Diversity committed to have effectively conserved at least 10% of marine and coastal ecological regions globally by 2010. Micronesian leaders responded to this commitment, and have taken this one step further by committing to effectively conserve 30% of nearshore marine and 20% of terrestrial resources by the year 2020. The Marshall Islands, the first Pacific Island country to prepare the National Biodiversity Strategy and Action Plan in 2000, now presents this document outlining our strategy to achieve the ambitious Micronesian Challenge.

As a small island developing state, we have a strong dependence on our natural resources and biodiversity - not only for food and income, but our relationship with these islands forms the basis of our culture and society. The unique culture and way of life of the Marshall Islanders has developed in harmony with our natural environment over thousands of years. In the face of global threats to our planet, the Marshall Islands is still a paradise, with pristine waters and coral reefs - contributing in an essential way to the productivity of the Pacific Ocean.

This document, *Reimaanlok*, presents a clear roadmap of the way forward. To achieve the ambitious targets of the Micronesia Challenge requires us to be strategic about what needs to be done, and to bring all resources to bear.

Now is the time for cooperation and collaboration. One agency or one person cannot effect the changes that are required to ensure the viability of our island biodiversity. The hard work and dedication of the *Reimaanlok* team, drawn from a number of government and non-government organizations in the Marshalls and utilizing the assistance of international expertise, demonstrates what can be achieved with cooperation by producing this National Conservation Area Plan.

There is so much to be done - we are only just starting on the path to have our communities around the world come into balance with the resources we live from, and this plan demonstrates the Marshall Islands' intent to show leadership in the Pacific Region. This plan shows that conservation is not only about setting aside wilderness areas, but it is about creating dialogue, strengthening communities and valuing our people's knowledge and understanding of our reefs and forests. Indeed, the fact that our people have lived in harmony with our islands for thousands of years suggests we have something important to teach others in the world about conservation.

I invite you to read *Reimaanlok: A National Conservation Area Plan for the Marshall Islands* as an indication of my people's commitment to leadership in conservation.



Frederick H. Muller  
Minister of Resources and Development  
Republic of the Marshall Islands

April 7, 2008



Photo: Jim Maragos, Ph.D., Reef ecologist. 2007

the riveting gaze of a Camouflage grouper (*Epinephelus polyphekadion*) at Ailinginae Atoll

# Vision

I could imagine what she looked like  
An amazing haven untouched  
So perfect and beautiful in every aspect  
Mother nature at its best!

Rich bounties, diverse with life  
Spilling with abundant gifts  
So caring and loving to her people  
Inviting them to live from her with respect.

As the days pass, things change  
People's love for her grows dim  
They abuse and spoil her unique beauty  
Demanding and expecting more.

She humbly tells them how she feels  
How mutilated are her natural features  
She cries for them to stop  
From slowly turning her into an unwanted creature.

As time goes by, they begin to see  
How sad and hurt she has become  
They had failed to see their mother cry  
And decide to hear her plea.

Her beauty slowly regained  
Creatures once again in harmony  
And I know she is once again smiling  
Proud Mother and her family.



# Part 1: Introduction to the Plan

## 1.1 Why a National Conservation Area Plan?

Conservation and sustainable resource management has always been a part of Marshallese traditional culture. In the face of global losses of biodiversity, the Marshalls retain some of the healthiest and most pristine coral reef systems anywhere in the world. In recent years, however, biodiversity in the Marshall Islands has become threatened by increased pressures on fisheries, climate change and sea-level rise, increased urbanization and a loss of the traditional subsistence lifestyle, central to the identity and well-being of the Marshallese people.

These trends have strengthened commitment within the Marshall Islands government and communities **to establish and manage community-based conservation areas** in addition to other resource conservation strategies. The aim is to revive the physical and spiritual connection of people to their environment, to ensure the sustainable use of resources and food security, and to conserve the remarkable biodiversity of the Marshall Islands.

In 2000, the Marshall Islands was one of the first Pacific Island countries to complete its National Biodiversity Report, and the National Biodiversity Strategy and Action Plan (NBSAP) under the Convention on Biological Diversity. In 2006, the President of the Marshall Islands signed the **Micronesia Challenge**, a commitment by Micronesian countries and territories to **“Effectively Conserve” 30% of Nearshore Marine and 20% of Terrestrial Resources by 2020.**

*“this plan ... develops 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”*

Over the last decade, various efforts have been made to establish community-based conservation areas on different atolls. Those conservation initiatives have been led either by the Marshall Islands Marine Resources Authority (MIMRA), as part of the development of sustainable local fisheries, or by the national Environment Protection Authority (RMIEPA). In addition, some communities and leaders are pursuing the establishment of conservation areas independently, such as the protection of Ailinginae and Bikini Atolls, both being nominated for inclusion on the World Heritage list, and the initiation of resource assessment surveys on the atolls of Ailuk and Namu, supported by a local NGO.

The **need for an overarching framework for conservation area planning** became apparent as the learning and experience from all these activities has grown, along with the commitment to the Micronesia Challenge. The development of this plan and of accompanying processes and guidelines, through Project Reimaanlok, is intended to address this need.

The Marshall Islands is quite different to many other places – in terms of its geographic isolation, relatively low level of scientific study of the natural environment, the dependence on subsistence use of resources and the traditional land-tenure and governance systems. Therefore, this plan is unique to the special situation and needs

of the Marshall Islands – it looks somewhat different to those that have been prepared in other regions and for other countries.

One critical difference is that this plan does not attempt to identify specific sites for conservation areas, but rather, develops 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.

# Part 1: Introduction to the Plan

## 1.2 How this Plan was Developed

### The Planning Team

This Plan was developed by a team of resource management professionals from the Marshall Islands and internationally, over an intensive 8 month period from November 2006 to July 2007. In November 2006, a small Core Team was assembled which then engaged key resource management professionals from national and local government and non-government organizations to participate throughout the planning process – this was the National Planning Team. Additional experts from The Nature Conservancy (TNC) were consulted on aspects of the plan development. The entire process was a steep learning curve for all those involved, and thus has contributed in significant ways to the capacity of local professionals within the national resource management agencies.

### Principles of the Planning Approach

The principles of the planning process included:

**Inter-sectoral involvement** – participation was sought from a range of agencies involved in conservation in the Marshall Islands, primarily at the national institutional level.

**Consultative, open and transparent** – the concepts and details of the plan were developed and discussed in workshops and one-on-one meetings with stakeholders and opportunities were provided to review documents and outputs.

**Practical and relevant** – while drawing on international models and approaches for conservation planning, it was necessary to ensure the approach taken was directly applicable to the particular situation in the Marshalls.



**Members of the Reimaanlok National Planning Team at the 3-Day Workshop on Eneko Island, Majuro April 2007**

Back (left-right): Ned Lobwij, Melba White, Miram Ankeid, Andrew Finlay, Maria Beger, Emma Kabua, Caleb McClennen, Neiar Kabua, Candice Guavis, Karness Kusto, Nicole Baker, Albon Ishoda. Front: Joy Kawakami, Florence Edwards, Emelyn Simon.

**Building capacity for conservation** – the planning process was used as an opportunity to develop knowledge and skills, and to build real tools and processes that provide a foundation for effective conservation in the Marshall Islands. Thus the planning process also resulted in the development of the following tools:

- *RMI Conservation Geographic Information System (GIS)*
- *Guidelines for Collection of Local and Traditional Knowledge*
- *Process for Community-Based Fisheries and Resource Management Planning.*

## The Process

In December 2006, the Core Team considered various models for an ecoregional planning framework, settling on The Nature Conservancy's "*Designing a Geography of Hope*"<sup>1</sup>. Primarily, this was to ensure that the terminology and concepts are aligned with those used in other Micronesian countries (especially Palau and the Federated States of Micronesia) where TNC has been active in conservation planning. The framework was adapted during the planning process with the input of the National Planning Team.

The first stage of the planning process was to **compile information about biodiversity** in the Marshall Islands into a **Geographic Information System (GIS)**. A database was constructed and populated with satellite images of all atolls, atoll maps derived from high resolution satellite imagery, nautical charts and coral reef habitat maps developed by IMARS<sup>2</sup>, and information about special biodiversity and cultural features collected from review of literature and from interviews with local knowledge experts and scientists.

The building of the GIS database and preparation of maps was followed by an **intensive series of workshops**<sup>3</sup> to develop:

- **Objectives** for conservation in the Marshall Islands,
- **Conservation Targets** - those elements of

- biodiversity that we wish to conserve,
- **Conservation Goals** – how much of each Conservation Target is to be conserved, and
- **Definitions for key concepts** including "**effective conservation**", **Nearshore Marine Resources** and **Terrestrial Resources**.

A **Gap Assessment** was then carried out using GIS analysis to determine how successful existing conservation areas are in meeting the conservation goals.

A workshop was held in February 2007 to consider the **status and lessons learned** from past efforts to establish resource management plans and conservation areas. A working group then developed the *Process for Community-Based Fisheries and Resource Management Planning* (see section 4.1), as a set of guidelines for facilitators to assist communities. This was presented and discussed in two workshops with the National Planning Team.

**Action planning** was carried out throughout the planning process by identifying specific steps and actions needed to implement the plan. Part 4 of this Plan, "Taking Action: The Way Forward" presents these steps while specific actions and responsibilities are included in a separate document, *Reimaanlok Action Plan*.

A **review of the existing legislation** and international commitments related to conservation areas was also conducted. The recommendations for strengthening this legal framework were discussed in a further workshop with the heads of the relevant agencies and are presented in Part 4 of this Plan.

*"The planning process was used as an opportunity to develop knowledge and skills, and also to build real tools and processes ..."*

# Part 1: Introduction to the Plan

## Summary of Planning Process and Timeline

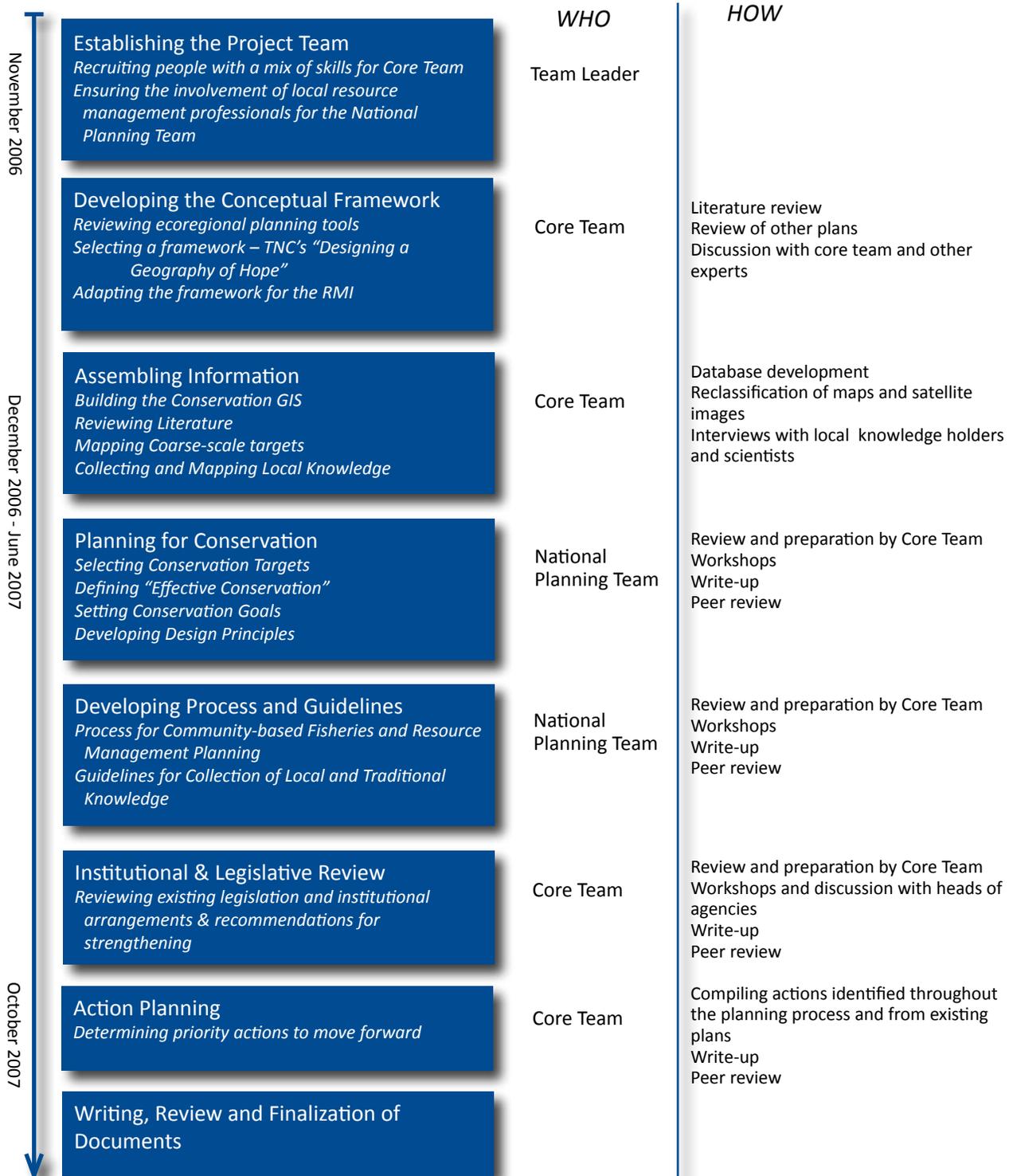


Figure 1: Summary of the Planning Process and Timeline

## 1.3 The Audience for the Plan

This plan is written for organizations and people who are interested in and committed to conservation and sustainable resource management in the Marshall Islands.

### Marshall Islands Government Agencies, Educational Institutions and NGOs

At a national level, agencies and organizations have both legal and general mandates to conserve and sustainably manage the natural resources of the Marshall Islands. For those agencies, the plan provides an overarching framework to guide the implementation of the Micronesia Challenge commitments and the continuation of the processes in place to develop and strengthen community-based conservation and resource management.

### Local Governments and Communities of the Marshall Islands

Local governments and local communities are directly responsible for the conservation and sustainable use of their resources. The active management of resources and dialogue about conservation is a rich part of the traditional culture and heritage, and contributes greatly to the spiritual well-being of the Marshallese people. This plan demonstrates how locally-driven actions contribute to an overall effort towards conservation in the Marshall Islands, and also describes the assistance available to local communities for conservation.

### International and Regional Environment and Conservation Organizations

International organizations (such as SPREP, TNC, CI and UNDP) provide funding and technical assistance to further the work of global and regional initiatives in conservation. This plan demonstrates the seriousness and intent with which the Marshalls is addressing conservation issues, and is designed to highlight gaps and areas of need for funding and technical assistance, so that international assistance may be more effectively targeted to the specific needs and priorities.

### Scientists and Educational Institutions Carrying Out Studies in the Marshall Islands

The work of scientists and educational institutions contributes greatly both to the knowledge and understanding of the biodiversity of the Marshall Islands, and to the capacity of local professionals and communities working on conservation. Scientists working on conservation and biological studies in the Marshall Islands should refer to this plan to understand the various activities underway to implement conservation and to help the Marshalls to address the information and technical assistance needs for the future.

## 1.4 Timeframe and Monitoring

This plan is intended to provide guidance for conservation activities in the Marshall Islands for 5 years, from 2007-2012. A complete review should be carried out in 2012. In monitoring the implementation of the plan, an annual review should be made of progress against meeting Conservation Goals at a national level (see section 3.3) and review of the national network of conservation areas against Design Principles (see section 3.5). Additionally, the effectiveness of conservation area management should be reviewed in line with the community-based management plans (see section 4.1).

# Part 2: Background and Context



Photo: Jim Maragos, Ph.D., Reef ecologist. 2007

## 2.1 Place, People and Biodiversity

Twenty-nine low-lying coral atolls and five solitary low coral islands rise over 6,000 meters (20,000 feet) from the abyssal plain to no more than a couple of meters above the surface of the equatorial Pacific and comprise the islands known to the Marshallese as *Aelōñ Kein*. The Exclusive Economic Zone (EEZ)<sup>4</sup> of the Marshall Islands is over 2 million km<sup>2</sup> (770,000 sq. miles) and a mere fraction of that – less than 0.01% (183 km<sup>2</sup> or 70 sq. miles) – is land. A total of 1,225 individual islands and islets make up the Ratak (Sunrise) chain in the east, and the Ralik (Sunset) chain in the west. The atolls consist of biotic limestone on a deep basalt core, built over millions of years by living coral organisms that grew as the basalt core slowly subsided, creating a marine environment extremely rich in productivity, diversity and complexity. The entirety of the Marshall Islands lies in the central-western part of the Conservation International Polynesia/Micronesia Hotspot, and the northern Marshall Islands form the Key Biodiversity Area, Kabin Meto.

The youngest islands and atolls only breached the surface between 2,000 and 4,000 years ago, amid a slight lowering of sea-level. Archaeological evidence suggests the region was then immediately settled by the direct ancestors of today's Marshallese. Local stories (*bwebwenato*) and recent climatic records indicate that the land, biodiversity and people have been under constant pressure from waves, droughts and, occasionally, from typhoons – and are thus part of a dynamic environmental system.

## Part 2: Background and Context

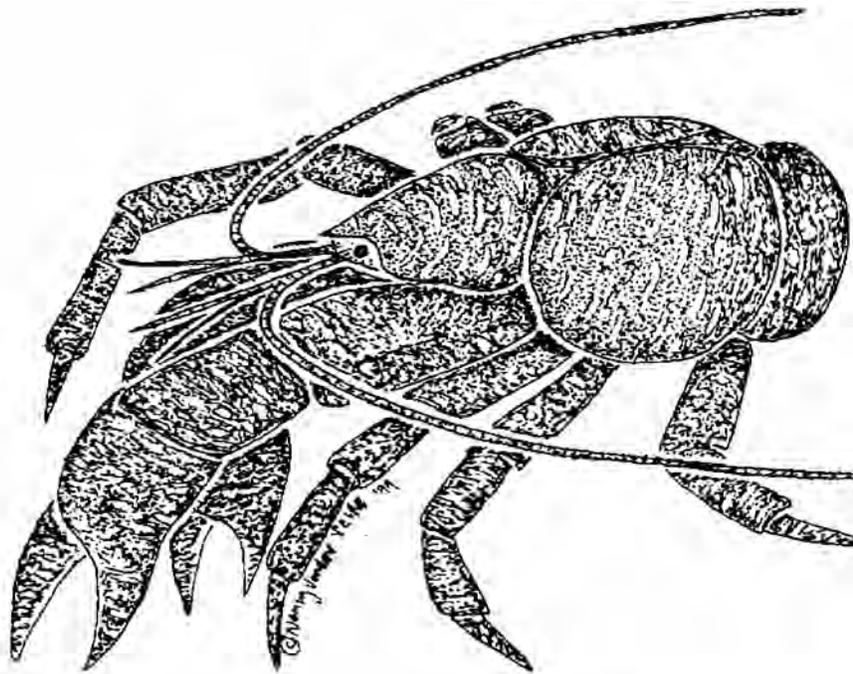
Of crucial importance to human survival in the Marshalls are larger sections of atolls which are capable of storing a fresh-water lens and thus allow for agriculture, and which also provide some degree of security during a typhoon. Traditional life was based on subsistence fishing and agriculture, and the Marshallese developed complex skills in agroforestry, fishing, sailing and navigation.

In the late 19th century, German traders established the copra trade in the Marshalls, creating a dramatic change in the landscape from traditional agriculture to the coconut plantations we see today. The Marshalls were declared a German protectorate in 1885 with headquarters on Jaluit Atoll. In 1914, as World War I broke out, Japan took over military possession from Germany and in 1922, was awarded the Marshalls as a League of Nations mandate. In 1933, Japan withdrew from the League of Nations and, in anticipation of World War II, it began militarily fortifying the atolls of Kwajalein, Wotje, Maloelap, Jaluit, and later Mili and Enewetak. After heavy fighting in the Marshalls, the islands were taken over by the U.S., and in 1947 the islands were given to the U.S. as a UN Strategic Trust Territory. From 1946 to 1958, the U.S. conducted 67 nuclear tests in, above, and around Bikini and Enewetak Atolls. This changed the landscape and seascape of these atolls, and exposed the population to radiation and resulting radiation-illnesses, dislocating people from their homelands and subsistence lifestyles and introducing a dependence on imported food and a cash economy. In 1986 the country became a self-governing democracy in free association with the U.S.; the Republic of the Marshall Islands.

At the time of Japanese administration, the population of the Marshalls was estimated at roughly 10,000 people, with no more than 500-1000 people per habitable atoll. The 20th century, particularly post-World War II, has witnessed a massive population increase to around 60,000, two-thirds of which are located in the

two urban centers of Majuro and Ebeye. Twenty-two atolls and 4 islands are inhabited.

The isolation and relatively low population means that the Marshalls have some of the healthiest and most pristine coral reef and terrestrial habitat in the world. Already a rich biodiversity has been catalogued and new species remain to be discovered. There are over 1000 species of fishes with more than 860 of these being in-shore, or reef, fish and the rest deepwater or pelagic. In addition, in the marine environment there are over 362 species of corals, over 250 of these being hard corals; 40 sponges; 1655 molluscs; 728 crustaceans; 128 echinoderms; 27 marine mammals and 5 turtle species<sup>5</sup>. About 700 land animals have been identified, mostly insects, along with 80 indigenous vascular plants.<sup>6</sup>



Coconut crab (*Birgus latro*)

## Our People, Our Land and Forests

With only 182km<sup>2</sup> (70 sq. miles) of land and a small proportion of this being suitable for settlement, land is the most prized possession in the Marshall Islands and forms the basis of Marshallese culture. A major difference between the Marshall Islands and other Pacific Island areas is that soil was thought to be stabilized and beginning to be colonized by plants and animals for only a very short time before people arrived. So when people came here and established food crops and other useful species, they probably had more of an influence shaping the land environment than almost anywhere else on earth. Since the land the ancestors found here was so limited and accessible, they were also able to influence a greater proportion of the natural environment than most other places.

So humans can be seen to be an integral part of the land ecosystem here in the Marshalls. The Marshallese people retain a tremendous knowledge of native forests and plants, and strong skills in agro-forestry. In fact the maintenance of much of the forest and vegetation relies on humans for propagation and management.

## Our People and Our Seas

The people of the Marshall Islands are accomplished seafarers, navigators and fishermen. 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.<sup>7</sup>

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.

# Part 2: Background and Context

## 2.2 Threats

### 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.

### Invasive Species

Many land and marine invasive species, both plants and animals, are threatening the biodiversity of the Marshall Islands. Once an invasive species becomes established it can be extremely difficult and expensive to control or eradicate. There are many examples of invasive species already established in the Marshalls including the plants *Merremia peltata* and *Wedelia trilobata*, the long-legged crazy ant and the Red-vented Bulbul (bird). Invasive species can cause the extinction of native and endemic species by taking over their positions in the ecosystem, or through predation.

### Illegal, Unreported and Unregulated Fishing

Several fishing vessels have been caught in recent years fishing illegally in the atolls of Bikini, Ujelang, Jaluit and Mili. Additionally, fishing companies based in Majuro are known to approach the inhabitants of atolls and trade goods with them in exchange for delicacies such as giant clam, lobster, coconut crabs, sea cucumber and shark fins. The true extent of unreported, illegal and unregulated fishing is unknown due to inherent difficulties in monitoring.

### Overfishing

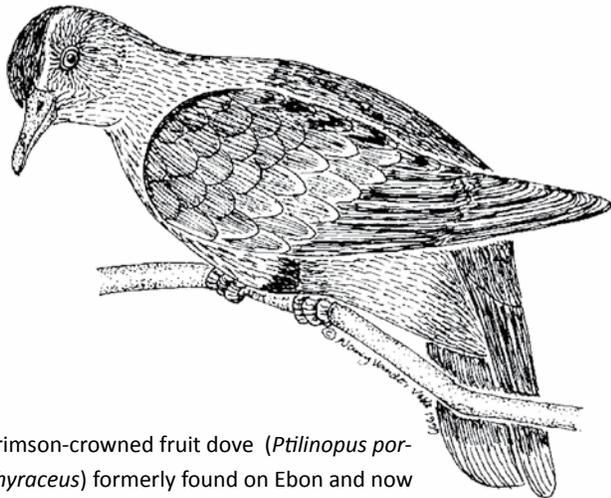
Overfishing is a threat to marine biodiversity everywhere and the Marshalls is no exception. With the decline of copra production and trade, many outer island communities are looking to other means of generating income and one key strategy for economic development is the establishment of commercial in-shore fisheries. There is a growing threat of overfishing of in-shore fisheries especially if key areas such as spawning sites are not effectively managed.

### Urban Development and Pollution

Since independence and the signing of the Compact of Free Association with the United States, the Marshall Islands has embarked upon extensive infrastructure development, especially at the urban centers of Majuro and Ebeye. This has destroyed natural habitats in the most concentrated parts of these atolls, while less developed portions of the atolls are increasingly threatened by human encroachment and development.

Urbanization and construction is a threat in a number of ways: through habitat depletion, sedimentation of marine ecosystems as a consequence of dredging and land reclamation, reductions of lagoon flushing through restriction or blockage of reef passes by road construction, and water pollution.

Rapid urbanization and the relative affluence of urban centers have given rise to serious waste and pollution problems in the Marshall Islands, particularly on Majuro and Ebeye. Waste and pollution pose serious threats to biodiversity including excessive nutrient loading in the marine environment and poorly managed landfills that provide habitat for invasive species such as rats.



Crimson-crowned fruit dove (*Ptilinopus porphyraceus*) formerly found on Ebon and now extirpated (locally extinct)

## Climate Change and Sea-Level Rise

There is no longer any doubt that climate change is a major threat to the Marshall Islands. The relative safety that the islands provide is in jeopardy and the islands are at risk from storm surge in the short to medium term, and complete inundation in the future. Rises in sea temperature will likely cause coral bleaching – the extent and impact of which is unpredictable. Ocean acidification is predicted to seriously impact the ability of corals to grow and form skeletons. In addition, any rise in sea-level could cause intrusion of saline water in the fragile fresh-water lenses that sustain terrestrial ecosystems and agriculture.



Baker Shot on Bikini Atoll July 25, 1946

Photo courtesy of National Nuclear Security Administration / Nevada Site Office

## Nuclear History of the Marshall Islands

From 1946 to 1958 the US military carried out 67 tests of nuclear weapons on Bikini and Enewetak. While the atolls of Bikini, Enewetak, Rongelap, Ailinginae and Utrik received the bulk of radiation and fallout from these tests, it is thought that most atolls in the Marshalls received some radiation. The long-term impact of this testing on the biodiversity of the Marshall Islands is unknown, but in some cases this has meant a form of protection for biodiversity as what were once highly habitable islands are now unpopulated, and the biological resources (particularly the terrestrial resources) are deemed unsafe to eat.

## Part 2: Background and Context

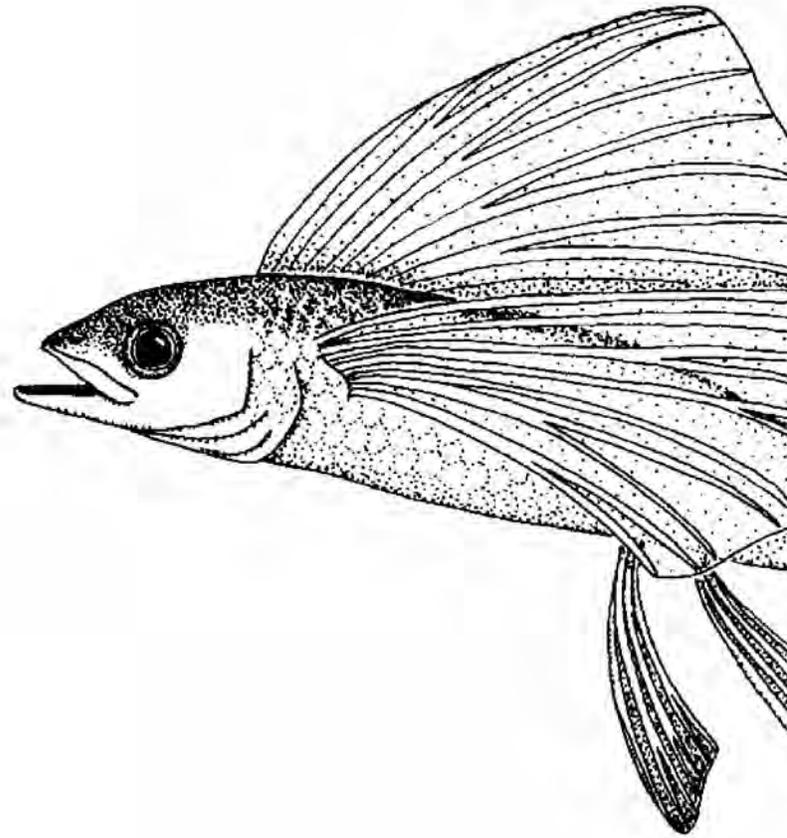
### 2.3 A Brief History of Conservation in the Marshall Islands

#### Traditional Environmental Management

In the past, the people of the Marshalls developed many methods for the sustainable harvest of resources. One of the methods remaining in use in some areas is “*mo*” – the traditional system to designate parts of land, a whole island, or a reef area, as a restricted site. Special permission from the *iroij* was required to visit a *mo*. Harvesting from the *mo* would be done for special occasions, or in times of need, such as during a drought. The rules and regulations for *mo* varied across the archipelago and would often involve rituals and chants. There was the belief that failure to observe the rules, rituals and chants could result in a bad storm for the homeward journey, or a tragic accident for a member of the visiting party. Other methods for conserving natural resources included seasonal harvesting of different species and other restrictions, such as those practiced on Wotje Atoll where the size of coconut crabs was restricted and no females with eggs were to be taken.<sup>8</sup>

While on some atolls *mo* are still known by the community and are respected, in other places the community has no living memory of *mo* and this important method of conservation and sustainable use is being lost, along with the deep ecological understanding that accompanied it.

The need to document and revive the knowledge and practice of *mo*, and of traditional environmental management in general, has been repeatedly emphasized in work done since 1999 on planning for biodiversity conservation in the Marshalls. The Marshallese heritage, like other indigenous peoples around the world, includes a deep understanding of how to live in harmony with the environment. This Plan acknowledges the importance of reviving traditional knowledge and practice, while augmenting it with national and local government support for conservation.





## Recent Efforts in Conservation and Resource Management

In the last decade, national and local governments have taken many actions towards the conservation and sustainable management of biodiversity resources in the Marshall Islands. Some of the key efforts are mentioned briefly here:

### ***National Efforts on Policy, Planning and Coordination***

*1999-2000:* Development of the National Biodiversity Report and the Biodiversity Strategy and Action Plan (NBSAP).

*2002:* Establishment of M<sup>2</sup>EIC<sup>9</sup> as a collaborative multi-agency group focused on sustainable use of coastal resources, fisheries management and biodiversity conservation.

*2005:* Drafting of RMI National Coastal Management Framework and Atoll Coastal Management Plans initiated by RMIEPA for Majuro, Jaluit, Wotje and Majuro.

*2006:* Evolution of M<sup>2</sup>EIC to the Coastal Management Advisory Council (CMAC) and development of a strategic plan.

### ***Community/ atoll-level driven efforts***

*1997:* Bikini Atoll declared a protected area under local government ordinance.

*1999-2003:* Development of the Jaluit Atoll Plan of Management for conservation and sustainable livelihoods and, in 2004, declaration of Jaluit Atoll Conservation Area as a Ramsar site.

*2003:* Ailinginae, Rongelap and Rongerik declared as protected areas under local government ordinances.

*2003:* Fisheries management plans for Likiep and Arno Atolls drafted.

*2003:* Draft management plan for Mili Conservation Area prepared.

*2005:* Fisheries management planning for Majuro initiated.

*2007:* Fisheries and conservation management plan for Ailuk Atoll prepared.

### ***Biological Resource Assessment Surveys***

In addition, biological surveys have been carried out on Jaluit (2000), Likiep (2001), Ailinginae and Bikini (2002), Mili, Likiep, Ailinginae and Rongelap (2003), Namu and Majuro (2004), and Ailuk (2006) with the specific purpose of helping to identify areas of biodiversity significance for the establishment of conservation areas and fisheries management plans.

# Part 3: The Plan - A Blueprint

## 3.1 What is “Effective Conservation” in the Marshall Islands?



Photo: Jim Maragos, Ph.D., Reef ecologist. 2007

The true giant clam (*Tridacna gigas*) is rare throughout the world but remains abundant in some parts of the Marshall Islands

Under the Micronesia Challenge, the Marshall Islands has agreed to have **30% of Nearshore Marine Resources and 20% of Terrestrial Resources under “Effective Conservation” by 2020**. The definitions that follow are the result of several workshops, meetings and discussions with government and communities during 2006 and 2007, culminating in a 3-day planning workshop where these were discussed in depth and finalized. These definitions intend to provide an interpretation of the Micronesia Challenge commitment.

**Nearshore Marine Resources** are defined as all those resources below the high water mark oceanward to a depth of approximately 100m (basically at the ocean-side reef drop-off), and including the entire lagoon. Given this definition, there are 14,067 km<sup>2</sup> of Nearshore Marine Resources in the RMI.

**Terrestrial Resources** are defined as all land area outside of inhabited population centers. All land area in the RMI covers 182 km<sup>2</sup> but the amount of Terrestrial Resources has not yet been calculated.

# for Conservation Areas

## Definition of Effective Conservation

**Effective Conservation** of areas in the Marshall Islands is defined as management that:

- **maintains or improves** atoll ecosystems—their **biodiversity, health, productivity and integrity**,
- sustains **artisanal subsistence use** of resources, and
- protects and preserves areas of significant **natural and cultural heritage**.

Areas under Effective Conservation have:

- publicly developed, legitimately recognized and actionable **management plans** with clear management objectives,
- long-term **biological and socio-economic monitoring and evaluation** against management objectives, and
- some form of recognized **customary or legal rules and compliance** system.

In addition, areas under **Effective Conservation** are **part of a national system of conservation areas** that includes representation of all habitat types and special conservation targets.

## Types of Conservation Areas in the Marshall Islands

Existing and proposed conservation areas in the Marshalls can be broadly classified into two different management regimes, providing a useful comparison with internationally-recognized categories for protected areas.

**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 of 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.

## Part 3: The Plan - A Blueprint for Conservation Areas

### What does “Effective Conservation” actually look like in practice?

The National Planning Team considered how conservation of marine and terrestrial resources might differ, and what effective conservation would look like in practice.

#### ***Effective Conservation for Nearshore Marine Resources***

Marine areas under *Effective Conservation* will be actively managed according to their management objectives, based on the needs of the community. If applicable, national agencies or external facilitators would be expected to assist in educating the community about conservation management practices. Generally this will be interpreted as **subsistence-only fishing** and harvesting, **using non-destructive methods**. Subsistence use means that resources harvested in this area **cannot be sold, traded or shipped off-atoll** but are to be consumed by the community within the atoll. This applies to food fishes, aquarium fishes and invertebrates, shells for use in handicrafts, to name a few. There may be some exceptions in the instance of a traditionally managed *mo* which is under the control of an *Iroij*. Non-destructive methods of extraction refer to the collection of natural resources, such as fish, in ways that do not damage the natural habitat of these organisms significantly. In addition, it is expected that **some parts of the marine conservation areas would be designated as no-take zones**, which may be done completely, for particular species, seasonally, or for a fixed period of time (e.g. 5 years). Extraction of resources such as limestone will be prohibited in areas under Effective Conservation because of the destructive impact on natural habitats. Terrestrial vegetation adjacent to a marine area will be maintained to ensure stability of the land.

#### ***Effective Conservation for Terrestrial Resources***

Generally, *Effective Conservation* in terrestrial areas means **actively maintaining the current land use**. For agroforestry, it means **ongoing maintenance and management of the forests**. Many forests in the Marshall Islands are fast-growing and form successive states of dynamic equilibrium - meaning they are subject to periodic disturbances and changes in the assemblage of species. The natural history of the Marshall Islands makes it clear that people have been part of the terrestrial ecosystem for most of the time land has existed here. Most of the forests are able to tolerate a high level of use although this is not the case with the old stands of *Pemphis acidula*, which should be subject to high levels of protection.

Within forests, animals such as land crabs and birds need varying levels of protection depending on their vulnerability and abundance. The greatest threats to terrestrial animals and birds are habitat loss and invasive species including snakes, rats, crazy-legged ants and numerous plant species. Some terrestrial environments should be placed under **high levels of protection as habitats for important or threatened species**, to protect the life-cycle of these species.

It is recognized that marine and terrestrial ecosystems interact and do not exist independently from each other. Therefore, **marine and terrestrial conservation areas will be placed adjacent to each other** whenever possible.

## 3.2 What to Conserve? Selecting Conservation Targets

**Conservation Targets** are the elements of biodiversity and related cultural features that will be the focus of conservation and management planning efforts. Very simply, **they are the things that we wish to conserve or manage.**

A “coarse-filter/fine-filter” approach to consider conservation targets at different spatial scales was adopted for this, as outlined in The Nature Conservancy’s *Designing a Geography of Hope*.<sup>10</sup>

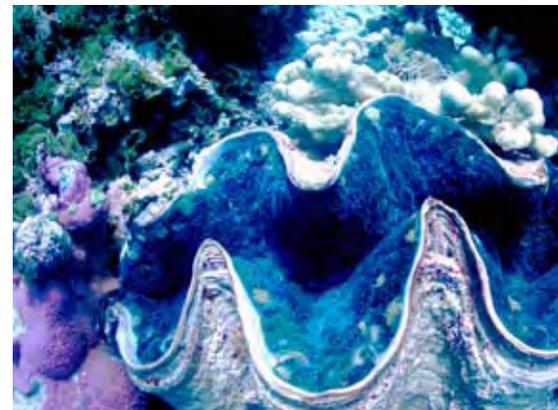
*Conservation Targets* are grouped into three types:

**a. Coarse-scale Conservation Targets/ Environmental Units:** Broad categorization of habitats and ecosystems that encompass all the biota of the Marshall Islands.

**b. Fine-scale Conservation Targets/ Special Features:** 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.

The conservation targets listed below are the results of three workshops of the national planning team, a literature review and extensive consultation with national and international experts familiar with the biodiversity and ecosystems of the Marshall Islands. The list was subsequently refined over a period of six months in discussions. Comprehensive tables of these targets are included as Appendix III with descriptions of each.



Photos: Jim Maragos, Ph.D., Reef ecologist. 2007

# Part 3: The Plan - A Blueprint for Conservation Areas

## a. Coarse-scale Conservation Targets/ Environmental Units

<b>Terrestrial</b>
Agroforests
Indigenous broadleaf forests
Wetlands
<b>Marine</b>
Deep lagoon
Lagoon pinnacles
Lagoon slope
Ocean leeward reef <i>liklal</i>
Ocean Reef
Ocean Seabed
Ocean windward reef
Pelagic system
Reef flat
Reef pass and channel

## b. Fine-scale Conservation Targets/ Special Features

<b>Terrestrial</b>
Bird Island
Breadfruit forest <i>mā</i>
Climax forest communities: <i>kañal</i> ( <i>Pisonia grandis</i> ) and <i>kōjbar</i> ( <i>Neisosperma oppositifolium</i> ) forests
Mangrove area <i>joñ</i> , <i>bulabol</i> and <i>kimeme</i>
<i>Pemphis acidula</i> forest <i>kōñe</i>
Pond <i>pat</i>
Shrubland and grassland
Turtle nesting beach
Windward forest <i>jāñar</i>
<b>Marine</b>
Clam site
Fish spawning aggregation area (SPAG)
Point with extended ocean reef <i>bōke</i>
Reef hole <i>nam</i>
Seagrass meadow
<b>Traditional Special Areas</b>
Traditional reserve <i>mo</i>
Traditional special purpose area <i>bwebwenato</i>
Traditional special fishing location <i>lōb</i> , <i>kolla</i> , <i>wōd</i> in <i>ekonak</i>

Table 1: Conservation Targets for the Marshall Islands

## c. Species Conservation Targets

<b>Terrestrial</b>
Aquatic shrimp
Arno skink
Horticultural species <i>bōb</i> ( <i>Pandanus tectorius</i> clones), <i>iaraj</i> (taro)
Land crabs <i>atuñ</i> , <i>baru wan</i> , <i>barulep</i>
<b>Avifauna</b>
Bristle-thighed curlew <i>kuk-kuk/ kewak</i>
Great Frigatebird <i>toulōñ (f)</i> , <i>ak (m)</i>
Micronesian pigeon (including the Ratak subspecies) <i>mule</i>
Short-eared owl
Short-tailed albatross
<b>Marine</b>
Bigeye tuna <i>bwebwe</i>
Black-lipped pearl oyster <i>di</i>
Bumphead parrotfish <i>mem</i>
Cetaceans
Cowries and other shells <i>libuke</i>
Fisheries target species
Game fishes
Giant clams
Giant grouper <i>kidriej</i>
Green sea turtle <i>wōn / jebake</i>
Other turtles <i>wōn</i>
Hawksbill turtle <i>jebake</i>
Lobster <i>wōr</i>
Manta ray <i>borañ</i>
Napoleon wrasse <i>lappo</i>
Rare coral species
Sea cucumber <i>jibenben</i>
Sharks <i>bako</i>
Spotted eagle ray <i>imel</i>
Three-banded anemone fish <i>banij</i>
Whale shark

## Where Conservation Targets Occur

**Coarse-scale marine conservation targets** were mapped based on a raw satellite imagery (IKONOS, Quickbird, LandSat and ASTER), coral reef habitat maps classified from Landsat7™ satellite image analysis (IMARS<sup>11</sup>), and previously vectorized nautical charts.

**Coarse-scale terrestrial conservation targets** have not been mapped during the preparation of this plan due to time constraints. The existing satellite photos will need to be manually reclassified into the three coarse-scale terrestrial Conservation Targets at a later date.

Occurrences of **fine-scale conservation targets** were identified using three methods:

1. review of literature,
2. personal observations of experts from field experience, and
3. local knowledge.

These were mapped as point-data only as information about their extent/area was not able to be captured at this time. Some points, as they occur on small islands, can be extrapolated to the entire island.

Staff from MIMRA and OEPPC develop the method for mapping local and traditional knowledge.  
Left-right: Terry Keju, Ned Lobwij, Albon Ishoda, Jeffrey Zebedy.



Photo: Nicole Baker. 2007

# Part 3: The Plan - A Blueprint for Conservation Areas

## Collection of Local and Traditional Knowledge

To gather local knowledge on Conservation Target occurrences, local planning team members interviewed more than 15 people knowledgeable about resources and special features in different atolls. Simple maps and data recording sheets were used to collect the information, which was then entered into the RMI Conservation GIS. Although the interviews were carried out only on Majuro, over 500 special biodiversity or traditional management locations across the entire Marshall Islands were mapped, providing a baseline of information that can be built on as more detailed information is gathered during conservation area planning at the atoll-level. This activity has successfully developed local teamwork and capacity in eliciting and documenting local knowledge of biodiversity and traditional management.

A process was developed by local facilitators for more detailed mapping of Conservation Targets with communities during the atoll-level management planning process. This process has been documented in the Guidelines for Collection of Local and Traditional Knowledge on Biodiversity Resources and Mo (see Appendix IV). Over time, as more information is gathered, it will be added to the RMI Conservation GIS.

Local and traditional knowledge is critical to the development of effective conservation in the Marshalls as it actively engages the community in a dialogue about their resources. While scientific information can augment this knowledge, the first-hand experience over many years, seeing seasons come and go, and the traditions and knowledge handed down from generation to generation, are invaluable from a conservation planning point of view.

### ***Example of Mapping of Conservation Targets: Wotho Atoll***

This map shows examples of fine-scale conservation target mapping. In this case, turtle nesting beaches and feeding areas, islands where birds nest or roost, special marine areas (such as areas with special coral or high density of giant clams), and areas known for coconut crabs are represented.



Figure 2: Conservation Targets on Wotho Atoll

## 3.3 How Much to Conserve? Setting Conservation Goals

**What proportion of an ecosystem needs to be conserved to ensure that ecological processes remain intact? How many populations of target species are needed to sustain the species in the planning region? How much is enough?** <sup>12</sup>

The answers to these questions help set a national framework for conservation planning. However, the process of setting Conservation Goals in the Marshall Islands was subject to all the uncertainties that often hamper conservation planning - a lack of data and a limited understanding of the area that needs to be protected to maintain habitats and species, and to ensure the persistence of ecological processes.

There is no general consensus between conservationists on how much is enough. The Conservation Goals developed for the Marshall Islands in this plan take the Marshall Islands commitment to the Micronesia Challenge as a minimum – i.e. to effectively conserve 30% of Nearshore Marine Resources and 20% of Terrestrial Resources by 2020. Those goals aim to balance the immediate use of a resource in sustaining human communities with the need to ensure the ongoing health and productivity of habitats and ecosystems.

### National Conservation Goals

*National Conservation Goals* define **amounts of conservation targets the Marshall Islands aim to conserve** across the entire country. Two sets of *National Conservation Goals* are presented here- amount of target to be under *Type I - Subsistence Only* management and the amount of target to be under *Type II- Special Reserve* management.

Type I Conservation Goals are **inclusive of** Type II Conservation Goals, which means that the area covered by Type I management is calculated to include area under Type II management.

### Atoll-level Conservation Goals

In addition to the overall National Conservation Goals, the Marshall Islands has a goal to have effective conservation of **at least 30% of Nearshore Marine Resources and 20% of Terrestrial Resources on every atoll**. This will be more achievable on some atolls than on others. The figures for the National Conservation Goals are therefore to be used as **guidance** when carrying out atoll-level management planning and conservation area design, but are not prescriptive. For example, 100% of the atolls of Bikini and Ailinginae will be under Type II management while more heavily populated atolls, such as Majuro, may not be able to achieve 30% of Marine Resources under Type I management.

#### How much to conserve? What the experts say....

In 2004, the CBD Conference of the Parties<sup>13</sup> committed to have at least 10% of the world's ecological regions "effectively conserved" by 2012<sup>14</sup>. In 2003, the World Parks Congress recommended to the UN General Assembly that national networks of marine protected areas include no-take areas covering 20-30% of habitats by 2012. Other authors recommend that conservation of 20-40%<sup>15</sup> works best for fisheries enhancement, while it is suggested that more than 30%<sup>16</sup> of coral reef systems need to be no-take areas to be robust to the impacts of climate change. Some of the leading marine scientists in the world, the Pew Fellows, recommend placing "no less than 10% and as much as 50% of each ecosystem in no-take zones, according to identified needs and management options of a particular ecosystem".<sup>17</sup>

# Part 3: The Plan - A Blueprint for Conservation Areas

**Table 2: Conservation Goals for Coarse-scale Conservation Targets.**

a. Coarse-scale Conservation Targets/ Environmental Units	Type I Goal	Type II Goal
<b>Terrestrial</b>		
Agroforests	50%	-
Indigenous broadleaf forests	20%	10%
Wetlands	80%	-
<b>Marine</b>		
Deep lagoon	30%	0-5%
Lagoon pinnacles	30-40%	0-15%
Lagoon slope	50%	0-15%
Ocean leeward reef liklal	30-50%	0-10%
Ocean Reef	100%	-
Ocean Seabed	-	-
Ocean windward reef	30-50%	0-10%
Pelagic system	-	-
Reef flat	30-50%	0-10%
Reef pass and channel	80-100%	0-30%

**Table 3: Conservation Goals for Fine-scale Conservation Targets.**

b. Fine-scale Conservation Targets/ Special Features	Type I Goal	Type II Goal
<b>Terrestrial</b>		
Bird Island	100%	50%
Breadfruit forest mā	100%	0%
Climax forest communities: <i>kañal</i> ( <i>Pisonia grandis</i> ) and <i>kōjbar</i> ( <i>Neisosperma oppositifolium</i> ) forests	20%	10%
Mangrove area <i>joñ</i> , <i>bula-bol</i> and <i>kimeme</i>	90%	-
<i>Pemphis acidula</i> forest <i>kōñe</i>	100%	50%
Pond <i>pat</i>	60-80%	-
Shrubland and grassland	100%	50%
Turtle nesting beach	100%	100%
Windward forest <i>jāñar</i>	100%	-
<b>Marine</b>		
Clam site	50%	30%
Fish spawning aggregation area (SPAG)	100%	-
Point with extended ocean reef <i>bōke</i>	30%	-
Reef hole <i>nam</i>	30%	-
Seagrass meadow	100%	-

**Notes on Tables 3 and 4:**

The values in Table 2 for Coarse-scale Targets are area-based, thus the % refers to a portion of the total area of that habitat-type.

The values in Table 3 for Fine-scale Targets are based on occurrences. That is the % refers to a portion of the total number of occurrences of the target. Thus if 200 climax forest communities in the Marshalls are identified, then 20 (10%) should be protected, and another 20 managed for subsistence use only. A total of 40 areas (20%) should be under effective conservation. Often the Fine-scale Targets are too small to easily map (consider a turtle nesting beach) and so the goals are set by occurrences rather than by area.

Conservation Goals are location and area-based, therefore there are no conservation goals set for Species Conservation Targets.

Some Conservation Targets do not have Conservation Goals associated with them due to uncertainty within the National Planning Team about appropriate goals. It is expected that the importance of these Conservation Targets and appropriate goals will be determined during atoll-level conservation planning processes.

For more details on specific management issues or ideas for each Conservation Target, see the comprehensive table in Appendix III.

## 3.4 Gap Assessment- Success at Meeting Conservation Goals

The gap assessment is done through GIS analysis of existing and proposed conservation areas. It shows how successful current declared and proposed conservation areas are at meeting the *Conservation Goals*. Note that this assessment does not cover the effectiveness of the current management or degree of implementation, which in most cases is not being effectively monitored and is therefore unknown. Figure 3 shows Type I and Type II management areas on Jaluit Atoll, as an example. Figure 4 shows the atolls with some form of current or proposed conservation areas.



**Figure 3: Satellite photo of Jaluit Atoll overlaid with the map of conservation areas: Type II areas are shown in red and Type I areas are shown in green.**

# Part 3: The Plan - A Blueprint for Conservation Areas

## Gap Assessment: Coarse- scale targets

Table 4 sets out the areas of coarse-scale targets now under conservation or management. This figure includes both Type I and Type II categories of conservation areas.

**Table 4: Success at Meeting Conservation Goals for Coarse-scale Conservation Targets/ Environmental Units.**

Target	Total Area (km <sup>2</sup> )	Existing or Planned Conservation Areas (km <sup>2</sup> )	Existing or Planned Conservation Areas (% of total)	Goal
Ocean reef (windward and leeward)	627.3	108.4	17%	50%
Lagoon slope	1120.4	258.8	23%	50%
Reef pass and channel	646.7	133.9	21%	80%
Lagoon pinnacles	77.8	9.6	12%	40%
Reef flat	1354.6	316.9	23%	50%
Deep lagoon	10239.7	1727.2	17%	30%
<b>Total Nearshore Marine<sup>18</sup></b>	<b>14066.6</b>	<b>2554.7</b>	<b>18%</b>	<b>30%<sup>19</sup></b>
<b>Land</b>	<b>181.9</b>	<b>28.9</b>	<b>16%</b>	<b>20%<sup>20</sup></b>
<b>Total</b>	<b>14248.8</b>	<b>2583.7</b>	<b>18%</b>	<b>-</b>

## Gap Assessment: Fine-scale targets

Table 5 provides a few examples of the percentage of these fine-scale targets under conservation or management. This table should be read with caution as it relates only to the occurrence of targets that have been identified and mapped in the RMI Conservation GIS. There may be other occurrences not yet mapped and therefore the actual percentage under protection is probably lower.

**Table 5: Success at Meeting Conservation Goals for Fine-scale Conservation Targets/ Special Features.**

Target	Total Count	Conservation Count	Percentage Under Conservation (occurrences)	Goal
Bird island	64	26	<b>41%</b>	<b>100%</b>
Mangrove area	16	4	<b>25%</b>	<b>90%</b>
Turtle nesting beach	51	14	<b>27%</b>	<b>100%</b>



# Part 3: The Plan - A Blueprint for Conservation Areas

## 3.5 Design Principles

Design principles are guidelines for the selection, design, establishment and management of conservation areas. The principles were discussed and developed during a 3-day workshop by the National Planning Team, based on those used in the Great Barrier Reef Marine Park<sup>21,22</sup>, Palau's Protected Area Network<sup>23</sup>, Kimbe Bay<sup>24</sup> in Papua New Guinea and international literature. These principles can help achieve the Conservation Goals in an ecologically sound and socially acceptable manner and will help to ensure the system remains resilient to global threats such as climate change.

Design principles are applied here at two key scales:

### National-Scale Design Principles

National-scale design principles are used to guide the development of the overall national conservation area network for the Marshall Islands. They can be used to periodically assess how well conservation areas across the nation meet the basic requirements of an effective eco-regional conservation area network.

**Comprehensiveness:** Conservation areas should represent the full range of biogeographic and socio-cultural diversity.

**Balance:** The network should be balanced (i.e. not under representing some targets and over representing others).

**Adequacy:** Conservation areas should be large enough, and the ecosystems being conserved should have viability and integrity to allow them to persist.

**Representativeness:** Conservation areas should include sites typical of, or a good example of, a habitat type or feature.

**Efficiency:** Conservation and management should aim to achieve the objectives with minimal resource use, cost, and effort.

**Key sites:** Include sites that contain rare or unusual features, areas of special cultural significance, areas of high biodiversity or endemism and areas with significant populations of threatened species.

These principles should be used to review and assess the overall conservation area network periodically, to determine whether conditions are being met and where additions and adjustments are needed.

## Atoll-Scale Design Principles

At the atoll-level, the design principles provide guidance to the facilitator and the community on how to select the most appropriate sites within the atoll. These design principles include both biophysical and socio-economic considerations and can help achieve conservation goals (the quantity of each target to be managed) in an ecologically sound and socially acceptable manner.

These principles serve as a guideline only. Facilitators who work with local communities should acquire a good enough understanding of these principles to be able to modify them in a sensible way to suit the community. Each atoll will have different requirements and slightly different management objectives. The resulting conservation area design will have considered and balanced as many of the design principles as possible.

**Comprehensiveness and balance:** Conservation areas should represent the full range of atoll-wide biogeographic and socio-cultural diversity and its variation.

- Determine which habitats, processes, threats and community uses/ habits are relevant to achieve the management objectives and ensure *ALL* these are addressed in the selection of conservation areas.
- Include both inhabited and uninhabited areas:
  - Inhabited: often high threat, low health levels, but HIGH visibility which helps with education, flagship reserves and easier enforcement.
  - Uninhabited: already quite low threat from resident population, but more threat from illegal unchecked activities.
- Exposure - include both exposed and sheltered areas, and in-between.

**Protecting key sites:** Include special and unique sites including:

- permanent or transient aggregations of key fisheries species (e.g. groupers, Napoleon wrasses, invertebrates),
- areas that support high species and habitat diversity (e.g. passes),
- areas that support rare, endemic, or vulnerable species (e.g. birds, sharks, turtles, rare corals, and those on the IUCN red list), and
- *distinctiveness*: unusual, endemic, rare, or significant features are specifically considered.

**Adequacy:** Include sites and quantities of the target that allow its persistence, so that *Effective Conservation* is achieved. This means the resources continue to exist in a quality and quantity required to support the life of the local community that depends on them.

- **Threats.** Sites have priority if they have low threats. Highly threatened sites are only given priority if they host critically threatened or unique species.
  - Sometimes highly threatened targets must be protected because they are threatened everywhere.
  - Different types of threats must be reviewed separately.
  - A low threat site takes less effort to conserve than a high-threat site.
  - A low risk site for one threat can be a high risk site for other threats. The scenarios must be balanced on a case by case basis.
  - High threat sites are often required for visibility and education and sometimes for threatened species.
  - If a fishery or conservation target is threatened, explore why the community thinks it is threatened.
- **How big should the managed area be?** How much of each atoll should be under management, and how much of each atoll should be under Type I or Type II management?
  - Area must be large enough to maintain the feature to be protected, e.g. species with larger home range require larger conservation areas. Bigger is better.
  - What area do your animals need? e.g. damselfish territory can be ~1 m<sup>2</sup> but Napoleon wrasse needs a

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- much bigger area. Consider the target species in an area- what size do they need?
- When designing sites, size and shape can be determined by natural features, e.g. reef patch or island. Landmarks and seascape features are used to define boundaries so people know where it starts and ends.
- To discuss size of management areas with communities, consider producing an information sheet that shows target species and their ranges as a basis for discussion of size.
- **Adjacency:** Include habitats adjacent to each other in each management site.
  - Aim to protect adjacent habitats at the same management levels, to ensure the continuity of processes that require more than one target to function, e.g. choose reef flat adjacent to lagoon slope and outer reef targets.
  - Keep in mind land-reef interactions and ensure some managed areas on reefs and land are next to each other. For example coconut crabs need access to water to breed; mangroves, pollution and sedimentation cross the land-water boundary; and turtles need access from resting and feeding areas to nest peacefully on beaches.

**Existing protection:** Maintain and include sites where management already exists. Ask the community for existing or formerly active sites of traditional management (TM) (such as *mo*).

- Explore how the community defines the geographic delineation and rules of the *mo* or TM site.
- Try to understand why the TM/ *mo* were created.
- Incorporate active sites so the community can relate. Conservation will be more relevant if it is based on existing knowledge and sites, complemented by additional sites that achieve objectives not yet achieved by the TM.
- Inactive TM sites: Find out why this management stopped, and evaluate if it would be a good idea to resurrect these sites. What is the current use, and biological condition of these sites? Carry out a rapid survey.

**Integrity:** Healthier ecosystems, or a less modified cultural context are better from a scientific perspective. If there is a choice of sites, choose the better, healthier site (everything else being equal). Choose a less healthy site that is close to the community to foster stewardship, community-monitoring initiatives, and education.

*This is something to think about when balancing between healthy habitat (often healthy because less accessible) and visibility (and thus stewardship).*

**Risk spreading:** Replicate areas, spread sites. Duplicate or triplicate targets in different areas, so choose more than one managed area for each atoll. This means if one area is damaged by a catastrophic event, there are still some good areas remaining to replenish the damaged areas.

Replicated areas dispersed over a wide geographic range allow for the recovery from a catastrophic event on one site (such as a typhoon, oil spill, crown of thorns outbreak) from other unaffected sites further away (don't put all the eggs in one basket, just in case).

**Representativeness:** Include sites that are typical of the target, and some say it should be among the better examples of this target. Conserve areas that are typical of a "type" of site

**Effectiveness:** While achieving conservation objectives, find conservation strategies that maximize outcome while minimizing the effort and resources required. Aim to achieve the best possible outcome with your limited resources.

## Socio-Economic Design Principles

### **Community-based issues:**

- Determine the concerns of the community to define management objectives.
- Understand and incorporate local knowledge and traditional fisheries management and conservation practices.
- Recognize and respect local resource owners and customary marine tenure systems and protect areas of cultural importance.
- Minimize negative impacts on existing livelihood strategies, and avoid conflicting uses (e.g. sites for tourism versus coral mining).
- Equity: Distribute costs and benefits fairly within and among communities.
- Consider current and future population trends and changing resource use.
- Identify use patterns that pose an unsustainable use threat.
- Ensure maintenance of cultural heritage and Marshallese lifestyle.
- Facilitators should take care not to over-sell the benefits of conservation or management to a user group. Be careful not to promise spillover in an already healthy system. Be careful with promising alternative income generation.
- For all design principles, facilitators need to translate concepts effectively to explain to the community, and how they relate to their objectives.
- Ecosystem education is needed in order to enhance understanding of ecological, social and economic issues affected by management.
- Ensure a transparent decision-making process and a fair process for dispute resolution.

### **Fisheries:**

- Ensure the management plan supports sustainable subsistence and artisanal fisheries for local communities by recognizing diverse livelihood strategies, and different areas and seasons for fishing.
- Consider the costs and benefits to local communities of managing commercial fisheries.
- Promote artisanal fishing over commercial coral reef fisheries, and manage, limit and prohibit unsustainable methods and fisheries (e.g. destructive fishing methods, live reef food fish trade, aquarium trade and fisheries for vulnerable species like sharks, rays, and sea cucumbers).

### **Shipping:**

- Accommodate existing shipping infrastructure (i.e. avoid placing highly protected areas in the vicinity of these areas).

### **Pollution:**

- Avoid establishing conservation areas next to likely sources of pollution (e.g. don't place a conservation area beneath a dump-site).

### **Other economic activities:** Consider a variety of economic activities and their effects on natural resources.

- Regulate game fisheries.
- Support sustainable aquaculture, but avoid proximity to aquaculture sites when selecting no-take reserves.
- Potential and planned developments, new enterprise: Avoid areas that have been or might soon be affected by new developments. Communicate conservation and management efforts to developers and other internal and external users to foster understanding and to avoid conflict.
- Tourist potential: Tourism creates alternative income and is frequently an incentive to establish conservation areas. Tourism can also damage the environment through inappropriate buildings or poorly managed tourism activities.

# Part 3: The Plan - A Blueprint for Conservation Areas

## 3.6 Limitations of Planning Process and Data Gaps

### Geographic Data Gaps

The isolation, vast expanses of ocean and the relatively little scientific study of the Marshall Islands means that there is a paucity of data that could be used in this planning process. The planning team relied very much on local and expert knowledge from past and recent visits to these atolls to conduct this analysis. Gathering local knowledge on occurrences of conservation targets was carried out by local team members with informants on Majuro only (although covering all the atolls of the Marshall Islands), and was difficult to achieve within the time available for the development of this plan. There are several uninhabited atolls in the Marshalls that are likely to have significant conservation value which includes bird roosting, resting and nesting sites, turtle nesting sites, and habitat for significant populations of giant clams and other rare or threatened species. One of these, Bokak (or Taongi) Atoll, is almost certain to have a unique terrestrial ecosystem. Some of these atolls were visited in 1988 as part of a rapid ecological assessment<sup>25</sup>, and some were visited in 1992<sup>26</sup> for a turtle survey. However, relatively little is known about these atolls from a scientific perspective.

In recent years, biological surveys have been conducted on the Atolls of Likiep, Mili, Rongelap, Ailinginae, Namu, Majuro, Ailuk, Jaluit, Majuro and Bikini, providing information on species, diversity and ecosystem health. This work has been used to assist communities to identify appropriate sites for protection and management.

### **Data on Terrestrial Coarse Scale Targets**

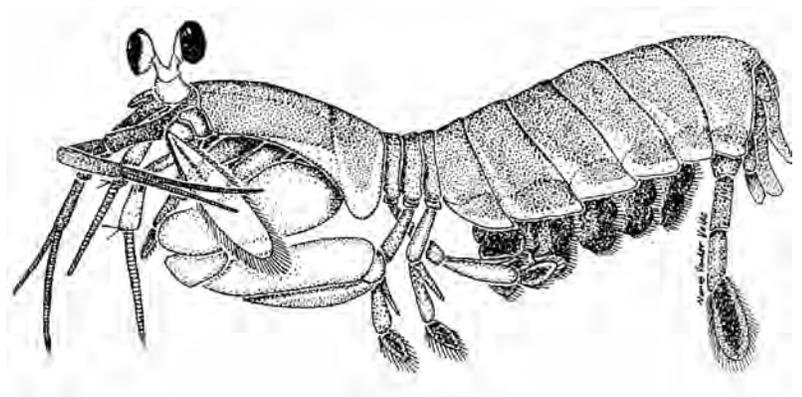
While data on marine coarse-scale targets was obtained from reclassified satellite imagery, there are no recent terrestrial vegetation maps of the Marshall Islands. It would, however, be possible to obtain the extent and occurrence of coarse-scale terrestrial targets from a manual reclassification of high-resolution satellite imagery. This was not feasible during this project and will be done at a later stage.

### **Open Ocean**

This Plan is focused on the Terrestrial and Nearshore Marine Resources, and does not explicitly consider open ocean as a focus for conservation. However, the Pacific Ocean itself is by far the largest system in the Marshall Islands. The nutrient rich waters surrounding deep sea seamounts provide a rich and productive habitat for many commercially and ecologically important species, and may be as important for sustainable fisheries as shallow coral reefs<sup>27,28</sup>. There are many seamounts and ocean reefs within the EEZ of the Marshalls, about which little is known.

### **Wetlands**

Preliminary studies of various ponds and mangrove areas in the Marshalls show they are likely to support various species of shrimp and other animals endemic not only to the Marshall Islands but to a specific island or pond<sup>29</sup>. Again, there is little known about these species or the wetland habitats that support them.



## Identification of Priority Sites

The planning team did not identify specific priority sites for conservation as is commonly done in ecoregional conservation planning processes. This was discussed during the planning process and it was decided that, in essence, the biodiversity of each atoll is important to those people who live on it, all atolls have areas worth conserving, and only the community and landowners of that atoll have the right to determine which sites they will conserve and which management strategies they will use.

In practice, though, some atolls are identified as being high priority for conservation action based on issues such as the level of leadership and political support, presence of an active fishery and the outstanding biodiversity value of some atolls.

In terms of developing a national framework for conservation areas, the Design Principles are intended to guide the selection of sites at an atoll-level so that communities can prioritize specific sites based on both socio-economic and ecological considerations.

## Viability Assessment

A viability assessment considers the size and condition of occurrences of Conservation Targets, and uses this information to prioritize areas with high viability for conservation. The planning team did not attempt a viability assessment of conservation targets due to lack of data and time constraints. As data is collected from local knowledge and from scientific surveys and entered into the RMI Conservation GIS in a usable form, this type of assessment may become possible in the future.



Photo: Nicole Baker, 2007.

*"...the biodiversity of each atoll is important to those people who live on it, all atolls have areas worth conserving, and only the community and landowners of that atoll have the right to determine which sites they will conserve.."*

## Part 4: Taking Action -

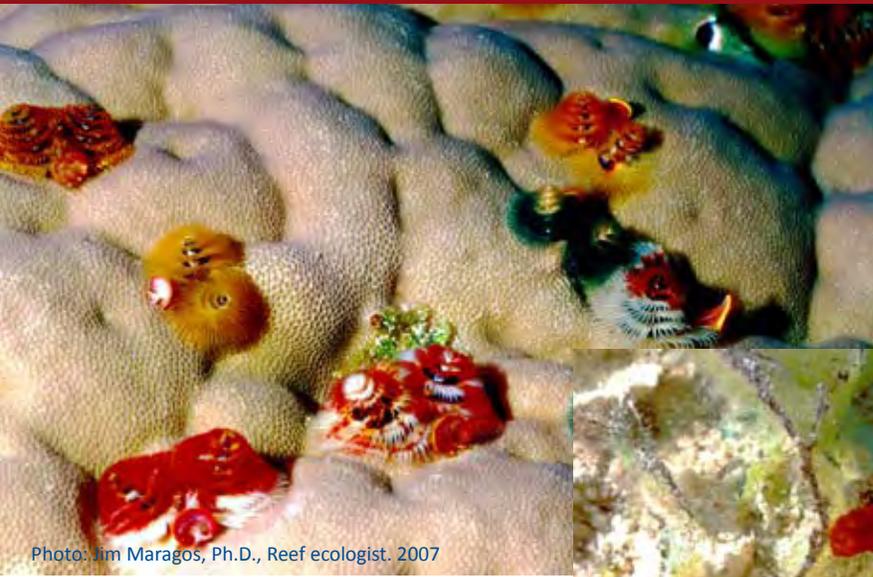


Photo: Jim Maragos, Ph.D., Reef ecologist. 2007

The Christmas tree worm (above), *Spirobranchus giganteus*, is found throughout the healthy reefs of the Marshall Islands. A vibrantly coloured red sea star (right).



Photo: Jim Maragos, Ph.D., Reef ecologist. 2007

# The Way Forward

Having set the goals and direction for conservation areas in the Marshalls in Part 3, Part 4 of the Plan describes the key strategies and actions for achieving those goals. The **primary strategy for the establishment and management of conservation areas is through community-based fisheries and resource management planning** on individual atolls. The actions outlined in this section are therefore focused on enabling effective community-based resource planning and management through the provision of adequate support from national level agencies. The strategies outlined in Part 4 are supported by the *Reimaanlok Action Plan* which may be obtained as a separate document from MIMRA.

The key strategies and actions fall under the following headings:

- 1. Establishing Community-Based Fisheries and Resource Management**
- 2. Managing Information**
- 3. Strengthening the Legal Framework**
- 4. Strengthening Coordination Mechanisms**
- 5. Securing Sustainable Financing**
- 6. Building Capacity**
- 7. Education and Awareness**



Photo: Jim Maragos, Ph.D., Reef ecologist. 2007

Fairy tern (*Gygis alba*) and a precious, precariously balanced egg

# Part 4: Taking Action - The Way Forward

## 4.1 Establishing Community-Based Fisheries and Resource Management

In February 2007, a “stock-taking” workshop was held to consider the status and lessons learned from past resource management and conservation activities in the Marshall Islands. MIMRA community-based fisheries management facilitators then worked to develop the *Process for Community-Based Fisheries and Resource Management Planning* to assist communities in establishing and managing conservation areas and sustainable fisheries, responding to weaknesses and the need for improvements identified in the stock-taking workshop.

The *Process* evolved from reflection on the experiences over the last few years in the RMI in the development of three related types of plans:

- **Community based fisheries management**; a process led by MIMRA in which MIMRA responds to requests from local governments to assist them in developing a resource management plan focused on sustainable fisheries.
- **Conservation management plans** led by the RMIEPA, such as that prepared for Jaluit Atoll which focused on balancing conservation with sustainable livelihoods.
- **Coastal management plans**, led by RMIEPA, that have been written for atolls with the highest population and subject to the greatest development pressures.

During these many discussions it was determined that atolls need an **over-arching resource management framework that addresses fisheries, conservation, and coastal zone management**. In order to implement this integration effectively, a **multi-agency approach** should be used in the development of the atoll management plans. This would be more effective than three different plans that intersect but are developed independently.

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 steps summarized in Figure

5 start from initiating a management planning process, building commitment within a community, and collecting detailed information about resources and resource use. A management plan is prepared based on the specific needs of the community combined with good ecosystem-based design principles. Implementation of the plan requires adaptive management and ongoing support.

This process is supported by a *Toolkit*, consisting of:

- Tools specifically developed to guide the collection and recording of local and traditional knowledge and practices<sup>30</sup>;
- Existing tools from various sources, including the **PIMPAC Management Planning Guidelines**; and
- Tools identified as needed, but not yet developed, which will be added to the toolkit progressively, such as socio-economic and biological assessment tools.

Both this *Process* and the *Toolkit* are **living documents**, designed to be updated and adapted as practice and implementation of community-based management in the Marshall Islands continues to develop and evolve.

### Role of National Agencies in Community-Based Fisheries and Resource Management

While the establishment of conservation areas is community-led, in practice this will usually require substantial support and leadership from national-level agencies, including both government and non-government organizations. The roles and responsibilities of these agencies will include:

- Project Management
- Fund-raising
- Providing relevant information, education and awareness to the community about the benefits of conservation areas
- Collecting and documenting local knowledge of biodiversity and resources
- Facilitating the development of management plans

with multiple visits and considerable time spent in communities

- Carrying out or initiating resource assessment and biodiversity surveys to assist in conservation area design
- Ongoing support, human and technical resources for the implementation of the management plan
- Developing policy instruments to support community-based resource management
- Developing and enforcing national laws and regulations
- Maintaining conservation and biodiversity-related information systems to support planning and effective management.

### ***Coastal Management Advisory Council (CMAC)***

The Coastal Management Advisory Council is a cross-sectoral working group of people from a range of organizations in the Marshall Islands, all with a common interest in the conservation, development and management of coastal and marine resources. CMAC functions as an advisory and coordination body and all activities are carried out under the auspices of the member organizations. CMAC is an essential body to ensure the coordination and collaboration of national efforts in conservation. Active membership of CMAC currently includes:

- Marshall Islands Marine Resources Authority (MIMRA)
- RMI Environmental Protection Agency (RMIEPA)
- College of the Marshall Islands (CMI)
- Marshall Islands Visitors Authority (MIVA)
- Office of Environmental Planning and Policy Coordination (OEPPC)
- Marshall Islands Conservation Society (MICS)
- Natural Resources Assessments Surveys Marshall Islands (NRAS).

It is intended to engage the participation of other relevant organizations in the CMAC process.



Photo: Nicole Baker, 2003.

Tranquil beauty of Ailinglaplap Atoll.

## Part 4: Taking Action - The Way Forward

### 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 Mejjatto. 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.

## Summary of the Process for Community-Based Fisheries and Resource Management Planning



Figure 5: Summary of the Process for Community-Based Fisheries and Resource Management Planning

# Part 4: Taking Action - The Way Forward

## Step 1: Initiation

Initiation is the first stage in the development of a community-based fisheries and resource management plan. Projects can be initiated in three key ways:

1. Local government requests assistance from MIMRA or RMIEPA
2. National agencies initiate process (such as RMIEPA coastal management plans)
3. Regional and international programs and funding (such as SPREP, Ramsar, World Heritage, OFCF fisheries support).

Projects are initiated for two key reasons:

- In response to increased development or ongoing resource extraction and a perceived need to manage this, and
- For conservation of special areas, heritage and biodiversity.

At initiation, dialogue is started with local government and traditional leaders, checking for support for the process.

**Critical Success Factors:** At this stage, it is essential that there be a stated commitment from elected and traditional leaders to support resource management and conservation in their community.

### Outputs:

- Document showing intention to develop a plan and an agreement between the lead agency and the local government.

## Criteria for Initiating National Support for Community-Based Management

The decision to apply national resources to a community-based management planning process is to be based on simple criteria against which atolls are rated High, Medium or Low. If an atoll requests assistance to develop a fisheries and resource management plan, the situation is assessed against the following criteria to determine if it will be an effective use of scarce resources.

### Biodiversity Value/ Natural Heritage Value

- Irreplaceability of the habitat and biodiversity
- Populations of threatened species
- Highest quality examples of special conservation targets
- Number of different conservation targets
- Health of the landscape/ seascape (integrity, naturalness, low threat/ pressure level)

### Level of use/pressure/economic dependence on resources

- Human population
- Presence of fish base
- Development activities
- Tourism

### Feasibility

- Level of leadership and political support
- Community-readiness
- Capacity and resources to implement
- Existing protection

### Leverage Potential

- The ability to affect conservation at several areas by taking action at an individual area, i.e. the visibility of an area.

## Step 2: Project Scoping and Setup

Once the need for a project has been identified and there is commitment from elected and traditional leaders, and adequate support from the national level, a project plan is drawn up for the development and implementation of a community-based fisheries and resource management plan.

**Lead Agency:** The Lead Agency will have ultimate responsibility for the implementation of the project. The Lead Agency will provide:

- the project manager;
- core funding for the project (either from core budget or from grants or other sources of funding); and
- logistical support/administration of core project funds.

The Lead Agency will be the first point of contact between the atoll-level leadership, external technical and financial support, and the project team. Any agency can be the Lead Agency, but it is likely this role will mostly fall to MIMRA, RMIEPA or MICS, as the establishment of conservation areas and resource management plans falls within their strategic priorities.

**National Project Team:** A project team is established consisting of facilitators from national agencies. National agencies will participate in the team according to their available financial and human resource capacity, and how well the project fits with their organizational priorities.

**Project Workplan:** A project plan is developed identifying key steps in the process, timelines and necessary resources including people’s time and financial resources. Subject to the available resources and the strategic priorities of each of the participating organizations, commitments of financial and human resources for the project are confirmed.

**External financial and/or technical assistance:** The need for external financial or technical assistance should be identified and proposals developed to obtain this assistance.

### Suggested Activities:

Activity	Suggested Tools/ Resources
Project Planning Meetings with Project Team	Project Plan Template <i>[under development]</i>

**Critical Success Factors:** It is essential to ensure that the time, financial and human resources committed to the project are adequate for the achievement of successful outcomes, based on lessons learned from the past.

### Outputs:

- Project Plan
- Commitments from agencies for resources
- Proposals for additional expertise or financial resources

*“It is essential to ensure that the time, financial and human resources committed to the project are adequate for the achievement of successful outcomes, based on lessons learned from the past.”*



Photo: Nicole Baker. 2007.

Developing the method for mapping local and traditional knowledge - a key element of community-based planning. Left-right: Deborah Barker, Neiar Kabua, Florence Edwards, Joy Kawakami.

# Part 4: Taking Action - The Way Forward

## Organizational Arrangements

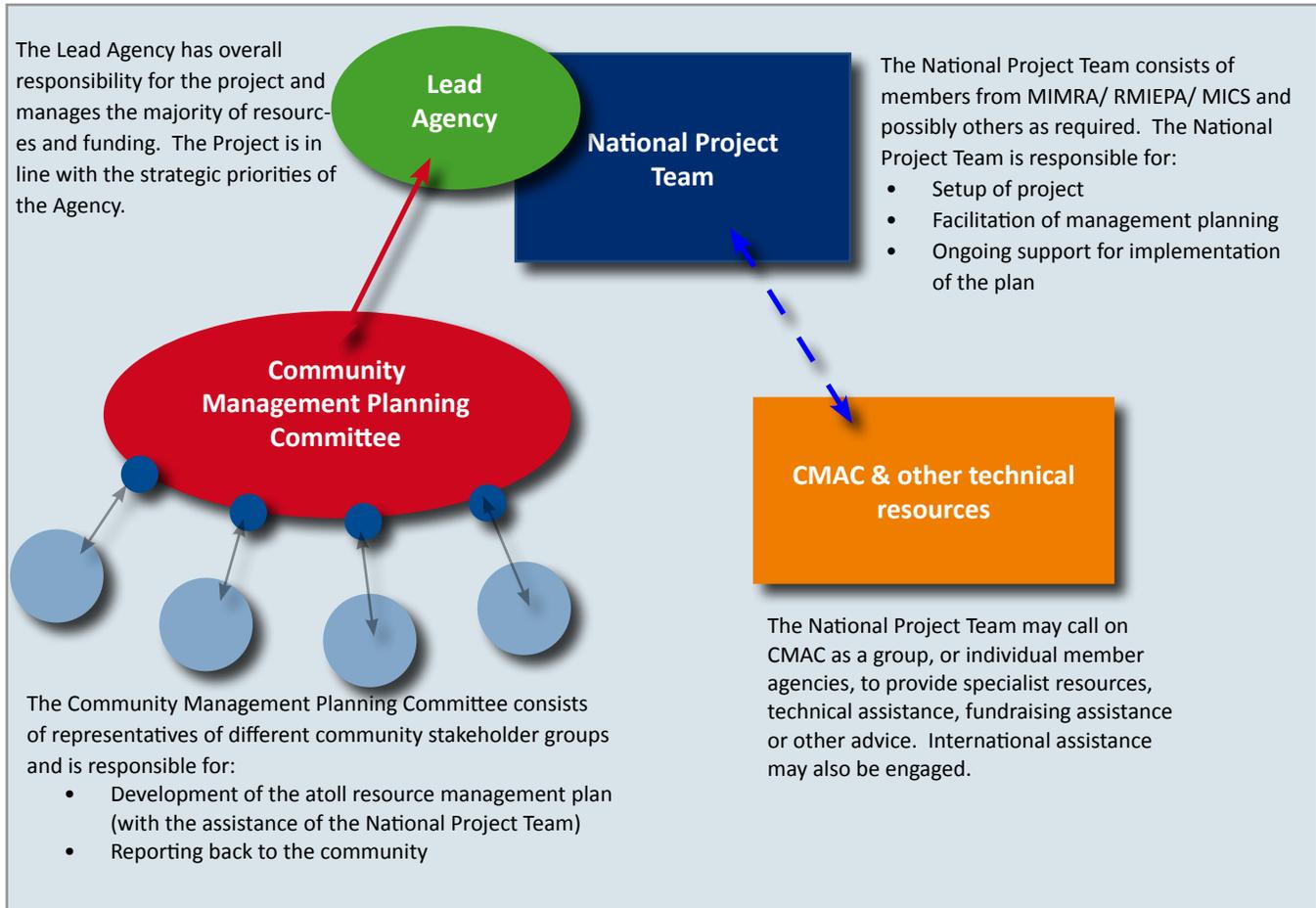


Figure 6: Organizational Arrangements for Developing a Community-Based Management Plan

**Note on the role of the Coastal Management Advisory Council (CMAC):** CMAC can play an important and well-defined role in this process to support the project team. Specifically, the project team can:

- Present the project plan to CMAC
- Report on progress against the project plan
- Ask CMAC for advice, ideas and offers of assistance when there are blockages
- Ask CMAC for assistance in gaining resources, writing proposals, technical assistance
- Ask CMAC for comments and feedback to improve the process.

## Step 3: Building Commitment

This entire step has been identified as an important precursor to developing the actual management plan. It provides necessary awareness-building for the community, and time for the community to consider the possibilities and implications of resource management and conservation.

The National Project Team will visit the community, primarily to commence a dialogue with the community and to raise awareness of the benefits of resource management and conservation. It is critical for the National Project Team to:

- understand the local interests and relationships,
- understand the degree of readiness within the community to develop a resource management plan, and
- build a relationship of trust with the community.

Towards the end of the visit, it is recommended that an Atoll/ Community Management Planning Group be established. It is also possible during this time that collection and mapping of local knowledge can be started.

### Suggested Activities:

<b>Activity</b>	<b>Suggested Tools/ Resources</b>
Presentations to schools, community groups, council members	Presentations on marine protected areas, management plans, other examples in the RMI Posters and education materials Activities for schools and groups such as snorkeling
Informal <i>bwebwenato</i> with community	
Stakeholder Analysis	PIMPAC Guidelines: Session/ Worksheet 2
Establish Local Management Planning Committee	Description of how to establish the Local Management Planning Committee and template Terms of Reference for Local Management Planning Committee. <i>[under development]</i>
Survey questionnaire to assess level of understanding and commitment	Standard Survey- <i>[under development]</i>

### Critical Success Factors:

- Most importantly, a successful outcome depends very much on a relationship of trust between the National Project Team and the local community. A further critical success factor in Building Commitment has been identified; if commitments are made to the community, then it is vitally important that the National Project Team keep those promises and do what they say they will do.
- The Local Management Planning Committee membership is key to the success of this process also. They must be people who are both accessible to, and respected by the community.

### Outputs:

- Stakeholder analysis
- Terms of Reference for Local Management Planning Committee
- Plan for Visit 2
- Survey/questionnaire results

# Part 4: Taking Action - The Way Forward

## Step 4: Collecting and Managing Information

This phase of work is primarily about collection of information that forms the basis for the development of the management plan. This involves collection of local and traditional knowledge and use of resources to obtain information about resource health and status, as well as collection of socio-economic information. If not done in the previous visit, the Local Management Planning Committee (at community or at atoll level) is established prior to detailed collection of information as they are key to the coordination of interviews and meetings.

### Collection of Local and Traditional Knowledge

A detailed approach to the collection of this knowledge has been documented by Marshallese facilitators in *Guidelines for Local and Traditional Knowledge Collection*, found in Appendix IV.

#### Suggested Activities:

Activity	Suggested Tools/ Resources
Community mapping of resources and use	<i>Guidelines for Collection of Local and Traditional Knowledge and mo in the Marshall Islands</i>

### Socio-Economic Survey

Collection of socio-economic information is important for understanding the degree of dependence of the local community on the natural resources for both subsistence and income-generation. Socio-economic information should be collected in a standardized way for both baseline information and ongoing monitoring, as discussed in Step 7.

Activity	Suggested Tools/ Resources
Socio-economic survey	<i>SEM-Pacifika socio-economic monitoring toolkit. SPC socio-economic survey method.</i>

### Baseline Survey of Natural Resources

At some stage during the management planning process, it is useful to have a baseline survey of resources – i.e. what is there and how healthy is it? Scientific data are useful to establish a baseline by which future impacts of resource management can be gauged through a standardized monitoring procedure. It is also very useful for education and awareness of the community, particularly where there are special biodiversity areas of national or international significance.

Because better management decisions can be made based on up-to-date information about the health and status of the natural resources to be managed, it is beneficial (although not essential) to get this information before final management decisions are made. Several options are available; the choice of method should be made based on the degree of reliability required and the resources available for the survey.

#### Suggested Activities:

Activity	Suggested Tools/ Resources
Qualitative* survey by members of National Project Team combined with local knowledge: quick survey of key locations with simple methods and low logistical complexity (e.g. snorkeling the reef, walk around in a forest)	<i>There is a need to develop tools/ methods to assist with this.</i>
Quantitative** survey by external experts / volunteer scientists and staff of National Project Team combined with local knowledge.	<i>NRAS survey methods or other standardized international survey protocols for marine and terrestrial resource assessments.</i>

\* Qualitative means that resulting information can assess the quality of the resource (e.g. does it look healthy, is it “good”, does it cover a large versus small area, is it really as good as the local knowledge suggested, is it a diverse or single species community, estimated percent cover or tree height)

\*\* Quantitative means that resulting information can assess the quality AND quantity (size, number, abundance, diversity) of the resource (e.g. does it look healthy, is it “good”, the area it covers, how many species exist, which threats exist and how bad are they, ground-truthing of the local knowledge and expanding it in inaccessible locations, measured percent cover or tree height)

### RMI Conservation GIS

All relevant knowledge to be collected is entered into the RMI Conservation GIS system. If required, a high-quality satellite image should be acquired for the atoll.

#### Outputs:

- Spatial and descriptive information of resources and use
- Socio-economic information
- Updated Conservation GIS

## Step 5: Developing the Management Plan

There are good tools available to guide the development of community-based management plans including the PIMPAC-LMMA Guidelines. The development of the management plan is to be primarily done through the Local Management Planning Committee. The development of the management plan is to be staged across several visits, with small gaps of time between each, using the following activities as a guide:

### Suggested Activities:

<b>Activity</b>	<b>Suggested Tools/ Resources</b>
Identify and prioritize Natural Resource Targets	PIMPAC Guidelines: Worksheet 4
Community mapping of natural resource targets, threats, resource use, currents, “mo” and description of rules around “mo”	<i>Guidelines for Collection of Local and Traditional Knowledge and mo in the Marshall Islands</i> (see also PIMPAC Guidelines Worksheet 7)
Identify and prioritize threats	PIMPAC Guidelines Worksheet 9
Community Visioning- determine development aspirations	PIMPAC Guidelines Worksheet 5
Develop objectives for management	PIMPAC Guidelines Session/ Worksheet 10
Identify management actions to achieve objectives	PIMPAC Guidelines Session/ Worksheet 11
Develop Indicators: Process (milestones), Biological and Socio-economic	PIMPAC Guidelines Session/ Worksheet 12
Prioritize management actions	PIMPAC Guidelines Session/ Worksheet 14
Select and design conservation areas/ management zones	<i>Marshall Islands Conservation Area Design Principles</i> Utilize voluntary advice from conservation planners via email or Skype.

Determine authority and responsibility	<i>There is a need to develop tools/ methods to assist with this.</i>
Develop an incentive plan/ enforcement plan	
Action plan with tasks, timelines and responsibilities	
Develop a budget for implementation of the plan and how to finance it	
Determine capacity- building plan	
Establish a sign-off procedure and dispute resolution process	
Present the draft plan and get comments and feedback from the community	Template for management plan <i>[to be developed]</i>
Present draft ordinances	Template for ordinances <i>[to be developed]</i>

### Critical Success Factors:

- Make sure consultation is held with all the influential people. Ensure Local Management Planning Committee is reporting back to the groups they represent and their community and that they have the appropriate level of authority.

### Outputs:

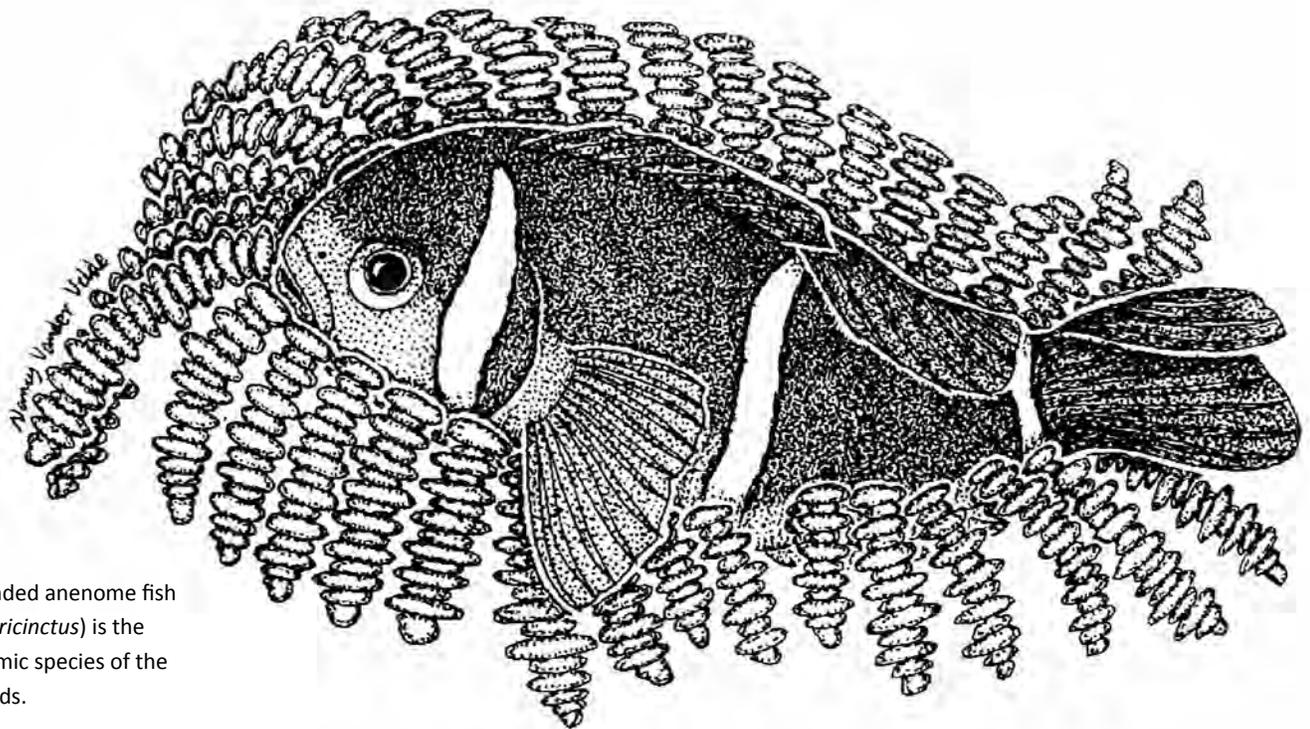
- Maps and datasheets of natural resource and conservation targets and uses
- Draft management plan

# Part 4: Taking Action - The Way Forward

## Step 6: Sign-Off

Sign-off is an important step in finalizing the management plan, and ensuring the community and the leaders are ready to implement the plan, including enforcement of rules and regulations. During the development of this process, it was acknowledged that the sign-off step has previously been a bottleneck in the process. Previously this sign-off step has been centred around the passing of local government ordinances, and this was often a difficult process.

In rethinking this, the sign-off process here refers to signing off on the management plan and agreeing to move forward in its implementation. There may be various ways to do this, depending on the particular circumstances. Some local governments may wish to pass an ordinance immediately, while other communities may indicate their intent to implement management strategies while developing local laws to be implemented at a later date.



The three-banded anemone fish (*Amphiprion tricinctus*) is the flagship endemic species of the Marshall Islands.

## Step 7: Monitoring, Evaluation and Adaptive Management

There is a clear need for the national support agencies to remain involved in the community-based resource management and conservation with each atoll on an ongoing basis to ensure that the actions are achieving their desired result, and to support the community in adapting the plan.

The national agencies should lead the community in establishing a monitoring program, including building community capacity in monitoring techniques.

Once indicators have been identified for socio-economic and biodiversity factors, monitoring is then conducted at regular intervals and analyzed in comparison to the baseline data. Results from this analysis show the effects the management regime is having.

Management Plans should be reviewed and evaluated in a participatory manner every three to five years to see if the management objectives are being achieved, and if they are not, adjustments should be made to the plan or to the management implementation.

In the early stages of implementation, the National Project Team should visit the atoll every 6 months to review and monitor the implementation of the management plan and ensure that the community has adequate support. This will emphasize to the community how important the implementation of the plan is.

In addition, the National Project Team should focus on ensuring buy-in from traditional leaders in encouraging people to adhere to the plan.

### ***Critical success factors:***

- Monitoring must be participatory.
- Actions must be achievable and successes celebrated.
- Management actions/ strategies must be adapted if the objectives are not being achieved.
- Leadership of the community must actively support the ongoing implementation and compliance with the management plan.

## Step 8: Maintaining Commitment

This stage will involve ongoing education and awareness and capacity-building for the community and should continue for many years after the initial plan has been developed. At a minimum:

- Annual training is provided to at least one member of the community on an ongoing basis (fisheries officer, conservation officer, leadership).
- Ensure an annual visit by an environmental education and awareness program.
- Ensure an annual participatory/community-led evaluation (supported from national level).

### ***Critical Success Factors:***

- Ongoing support from local elected and traditional leaders. Ensure that if further support is required from national level, then it is forthcoming.

# Part 4: Taking Action - The Way Forward

## 4.2 Managing Information

### Marshall Islands Conservation GIS

The Reimaanlok Project has developed a *RMI Conservation GIS* designed to function as a **central repository for all spatial biodiversity and resource management information**. It will be maintained and updated within MIMRA. All relevant government agencies, scientists and researchers who are working on conservation or resource-management related issues in the Marshalls will have access to the database and products. The capacity of the system will need to be developed over time by constructing new parts of the database to hold different types of information, such as socio-economic data, local knowledge of resources and biological survey data. This will require ongoing development of national capacity to manage the database. It should become a primary tool for resource management and conservation planning.

The first version of the *RMI Conservation GIS*, developed as part of Project Reimaanlok, incorporates the following features:

- Satellite images of all atolls
- Habitat maps of marine areas
- Maps of existing and proposed conservation areas
- Important legal boundaries: local government jurisdiction and territorial waters
- Point data of local and expert knowledge of special biodiversity features.

### Collection and Recording of Local, Traditional and Expert Knowledge

There are various reasons for the collection and recording of local and traditional knowledge on natural resources in the Marshalls including:

- identification of places and species that should be targets for conservation and management;
- empowering communities and encouraging their participation in developing resource management plans for their atolls, including provision for conservation and fisheries management, by acknowledging the existence and value of their knowledge;

- documenting and guarding against the loss of traditional knowledge and resource management practices as part of Marshall Islands heritage; and
- promoting traditional practices together with modern approaches where they reinforce conservation and sustainable use.

A workshop was held in December 2006 during which local resource management facilitators developed and documented *Guidelines for Collection of Local & Traditional Knowledge on Natural Resources and Mo in the Marshall Islands* (see Appendix IV). This approach considered key issues such as:

- using mapping as a powerful method for representing and discussing information with community members,
- protocol for approaching the community and traditional leaders,
- collecting information on biodiversity features, resource use and traditional management, and
- appropriate handling of sensitive information (such as favorite fishing locations or fish spawning aggregation sites).

The *Process for Community-Based Fisheries and Resource Management Planning* incorporates the collection and documentation of local knowledge as a key part of the planning process.

## 4.3 - Strengthening the Legal Framework

### Review of Legislative Framework

The Reimaanlok Project carried out a review of legislation in the Marshall Islands related to conservation area establishment and management and also to the conservation of important or threatened species. The key findings and recommendations have been agreed to, in principle, by the heads of the relevant government agencies, with concern expressed about the capacity of agencies to fully implement recommendations. Technical and financial assistance from outside the Marshalls will be required to implement these recommendations.

The legislative review considered aspects of resource governance specific to the Marshalls, before assessing the overall system against guidelines for effective marine protected area legislation outlined by Kelleher<sup>31</sup>. A summary of the key considerations and recommendations is presented here. Some of the key issues underlying this assessment include:

- Customary resource ownership and governance,
- Focus on community- based management of resources, and
- International recognition that community conserved areas (those under community management and sanctions) are legitimate protected areas, regardless of whether there is a formal legal framework<sup>32</sup>.

Importantly, within RMI local government and national resource management agencies, there is currently a “growth spurt” of capacity and intent to implement effective community-based conservation and resource management. The sector is in a phase of learning, testing new ideas, reflecting, sharing information and developing and documenting processes and procedures which may require a legislative foundation when more fully developed.

Based on these considerations the assessment and recommendations favor 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.

### Local Ownership of Resources and Governance Arrangements

Given the scarcity of land in the Marshalls, land is the most highly prized possession and “control of the land is the central theme of Marshallese culture.”<sup>33</sup> Land is divided into *weto* held under a matrilineal line. Land rights are shared between different levels of society: the *iroij*, or chief holds title over entire islands or atolls, The *alap* manages one or more *weto* and the *ri-jerbal*, or workers, cultivate the land, harvest marine resources and pay tribute to the *iroij* in return for the rights to live on the land and use the resources. The *iroij* establishes rules and manages the land and resources in a way that provides for all the people.

#### *Marine Resources*

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Marine resources are owned by the government. The Public Lands Act reaffirmed earlier Japanese law by severely limiting traditional rights and declaring all waters below the high water mark as the property of the government of the Marshall Islands. Several exceptions are mentioned, including rights up to four feet below the mean low water line of adjacent land owners and “the traditional and customary right of the individual land owner, clan, family or municipality to control the use of, or material in, marine areas below the ordinary high watermark.” However, all these exceptions are “subject only to, and limited by, the inherent rights of the Government of the Marshall Islands as the owner of such marine areas.”

#### *Land*

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All lands, with very few exceptions, in the Marshalls are under customary ownership. Traditional land rights are enshrined in the Constitution.

# Part 4: Taking Action - The Way Forward

## Customary Practice

Traditional resource management was inherent to the survival of the Marshallese and was given effect in marine areas by the establishment of *mo*, or taboo, areas. *Mo* can be on land or sea, and are not always associated with resource management, but frequently have some geographic delimitation. The level of this form of resource management that continues to this day varies from atoll to atoll, and in general, is stronger in the western, Ralik, chain of islands, with many *mo* areas still intact.

As in much of the Pacific, increased commercialization, foreign fishing pressures and a break-down of the traditional cultural system has led to the diminished effectiveness and use of the *mo* system. In many atolls, fishers can no longer recollect where the *mo* once were, and if they can, many are not respected or in place. Thus traditional systems of resource management provide a solid basis on which to present a variety of community strategies but, in and of themselves, are not effective enough at the current level of practice to adequately provide for all resource management needs.

## Addressing Different Types of Threats

While community-based sanctions are a primary strategy, resource managers have identified that this needs to be supported by the additional protection of well-enforced formal legislation. There are threats to conservation areas and species that are not adequately addressed at the community level, such as foreign and illegal fishers, negative impacts of earthmoving and pollution, and the inadvertent introduction of invasive species. In this case there is an opportunity to use national-level legislation and regulations and enforcement, to delegate authority for enforcement to local people and thus strengthen legal sanctions for these threats to conservation areas.

Special issues and needs arise in the case of remote atolls, such as Ailinginae, being nominated for a very high level of protection by its community and landowners. These atolls are uninhabited, although people have land rights there. Thus these atolls are in need mostly of protection from foreign illegal fishing and this requires effective surveillance and enforcement.

## General Model for Legislative and Institutional Arrangements

In line with these systems of governance, authority and customary tenure in the Marshall Islands, an appropriate model for the legislative framework is to have a national umbrella-style legislation that provides for community-based management, with local-level laws (ordinances) for the implementation of specific conservation areas.

In addition, national-level legislation should address specific issues that affect habitat and species, but which cannot be easily dealt with at a community level such as:

- protection of threatened or migratory species- especially through control of sale or trade,
- prevention of invasive species through inter-island quarantine procedures, and
- surveillance and enforcement of non-sanctioned fishing activity (illegal or unreported) that affects the near-shore marine environment.

In some cases, it may be useful to have conservation areas declared at the national level. The reasons for this include bringing enhanced recognition to the site, which in turn would bring increased resources and enforcement powers to the site. This may be appropriate where the site is of national or international importance for its natural or cultural value, and where there may be elevated external threats, such as illegal fishing vessels (as in the case of Ailinginae and Bikini Atolls being nominated for World Heritage status).

## Gap Assessment

Existing legislation was considered in light of Kelleher's guidelines for an effective legislative framework for marine protected areas. Key elements of such a framework include:

- The form and content of legislation *should be consistent with the legal, institutional and social practices and values* of the peoples governed by the legislation.
- Legislation and policy must take into account *any international, regional, or other multi-lateral treaties* of which the country is or will likely be a member. Should also be protection for migratory

- species of fish and birds.
- Legislation should *establish specific responsibility, accountability and capacity* for the management of conservation areas, and provide a general responsibility to ensure that government agencies work with local government, traditional owners, community bodies and individual citizens.
  - Legislation provides for *control of activities which occur outside a conservation area* and which may adversely affect features, natural resources or activities within the conservation area.
  - Legislation on conservation areas should require that *management plans be prepared for each site* and should specify the constituent elements of the plan. Should require periodic revision of zoning and management plans and research and monitoring.
  - *Local users of the marine environment must be involved* in establishing, maintaining, monitoring and implementing management of conservation areas, and it is desirable that this is anchored in legislation.
  - The legislation should provide for *surveillance of use* in order to determine the extent to which users adhere to the provisions of management; monitor the condition of the managed ecosystem and its resources; and measure any changes in user demands.
  - *Financial arrangements* for the management of marine areas should be identified in legislation.
  - Legislation must provide for *making regulations* to control or, if necessary, prohibit activities.
  - *Enforcement, Incentives and Penalties*: To be effective, legislation must be capable of being enforced.

The gaps between the existing legislation (national and local-level) were identified and then addressed with the following recommendations.

## Key Recommendations

### Short Term (0-2 Years)

#### Strengthen and Empower Local Governance of Conservation Areas

##### “Soft Policy”- Management Plan and Planning Process

Develop guidance on content and process of development of management plans that addresses the following issues:

1. Identify and establish specific responsibility, accountability and capacity building for management of conservation areas.
2. Create structures and procedures for coordination between agencies (national and local) with jurisdiction over resources.
3. Build procedures for community-participation in management planning.
4. Monitor, evaluate and review plan implementation.
5. Develop financial arrangements.
6. Define zones, boundaries and restricted or prohibited activities.
7. Control activities that occur adjacent to conservation area that may affect conservation area.
8. Enable enforcement, incentives and penalties.
9. Provide support to management and enforcement with effective education and awareness raising.

These aspects are being addressed by the *Process for Community-Based Fisheries and Resource Management Planning* presented in Section 4.1.

##### Legal Instruments- Local Government Ordinances

Ensure relevant sections of the management plan are represented in local government ordinances, especially:

- specific responsibility and accountability,
- financial arrangements,
- zoning, boundaries and regulations,
- enforcements, incentives and penalties, and
- dispute resolution processes.

# Part 4: Taking Action - The Way Forward

## **Protection of Species**

A particular gap in the legislative framework exists in the protection of threatened species. Regulations on threatened species should be promulgated that provide:

- list of species which are threatened (with reference to the IUCN Redlist, the CITES list and the Marshall Islands list of species conservation targets;
- protection of special habitat areas of threatened species; and
- restrictions/ prohibitions on harvest, trade and sale of species included in the list.

The threatened species regulations are to consider and allow for important customary practices involving use of the species, where possible. MIMRA has power to develop regulations for all marine threatened species (Marine Resources Act §242). The Minister of Resources and Development has the power to promulgate such regulations for all species.

Authority to enforce these regulations is to be delegated from R&D/ MIMRA to RMIEPA and local officers at the atoll level. The process of developing and implementing these regulations will be effective in raising awareness about threatened species.

## **Medium Term 2-5 Years**

### **Support Local Management with National Level Authority**

MIMRA is to promulgate regulations to clarify the “marine park” and “marine reserve” categories (Marine Resources Act §208) and may declare these reserves in support of community-managed conservation areas. This is to be supported by delegation of MIMRA authority to local officers allowing violations to be prosecuted by MIMRA.

RMIEPA may promulgate similar regulations for terrestrial conservation areas, under the National Environment Protection Act, and similarly delegate RMIEPA authority to local officers.

Enhanced protection through authority from these national level agencies will be most useful where there are external threats, or a far higher level of protection is required.

## **Medium-Long Term (5+ Years)**

### **Revision of National Legislation**

This review was done in the context of a particular institutional environment in conservation/ resource management in the RMI, in which there is a developing culture of cooperation and sharing responsibilities between national government agencies, civil society and local-level institutions. In this context, it is thought that the existing national legislation provides an adequate framework for effective declaration and management of conservation areas, assuming the medium term recommendations are addressed.

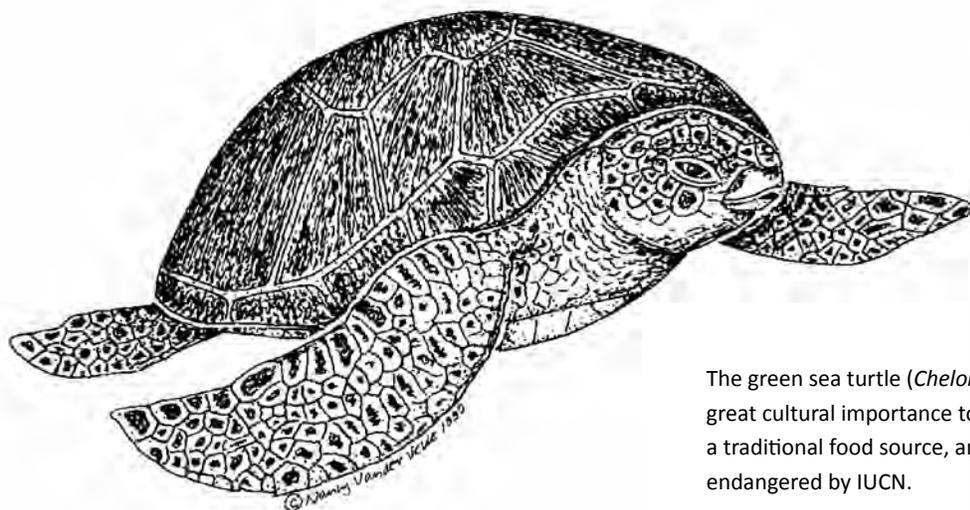
In the medium to long term, however, it will be useful to review the entire conservation-related national legislation and institutional responsibilities. This would allow some overlapping jurisdictions to be clarified, and could institutionalize inter-agency cooperation arrangements that are, as yet, in their infancy.

## 4.4 Strengthening Coordination Mechanisms

The successful implementation of the *Reimaanlok National Conservation Area Plan*, the achievement of the Micronesia Challenge and the implementation of the Coastal Management Advisory Council Strategic Plan requires ongoing focus on the effective sharing of information and coordination between different agencies. The Coastal Management Advisory Council has many strengths in this area and has the potential to become an effective mechanism for achieving this. Aspects for further development of CMAC include:

- Conducting meetings in a culturally appropriate manner that allows for the participation of all members.
- Keeping records and minutes from meetings.
- Ensuring the roles and responsibilities of CMAC and its member organizations are clearly defined.

To further the effectiveness of the scarce human and financial resources, it is intended to establish a database of conservation and resource management projects in the Marshalls, to help identify areas of overlap and synergy.



The green sea turtle (*Chelonia mydas*) is of great cultural importance to Marshallese as a traditional food source, and is also listed as endangered by IUCN.

## Part 4: Taking Action - The Way Forward

### 4.5 Securing Sustainable Financing

Effective management of conservation areas will be aided by sustainable financing to carry out long-term and committed programs with communities. These actions have been previously identified in line with the Micronesia Challenge, in the Marshall Islands Early Action Grant proposal. It is intended that a long-term fundraising strategy for the Marshalls will be developed during 2008 with the support of TNC. Part of this will be to determine how to make the most effective use of funds committed under the Micronesia Challenge.

### 4.6 Building Capacity

With the planning and establishment of community-based conservation and resource management, there is a need to build the capacity of these communities with the skills required to effectively manage. Many of these skills will be most effectively developed by working side-by-side with the national facilitators for the development of the plan and the follow up stages of monitoring and adaptive management. In addition, the community will need to have rangers responsible for monitoring, surveillance and enforcement. CMI is currently developing a curriculum for conservation area rangers and expects to start training in 2008.



Members of the community on Ailuk Atoll learn aquaculture techniques for income generation, as part of the overall conservation plan for the atoll.

Photo: Frankie Harriss. 2007.

## 4.7 Education and Awareness

Several education and awareness activities related to conservation are underway or are planned. These activities will be most effective when they focus on the education of both outer-island and urban communities, and are integrated into the *Process for Community-Based Fisheries and Resource Management Planning*. Two of the key activities under development are:

1. **RARE Pride** campaign: A local conservation leader has undergone the RARE Pride training and is now implementing an 18 month program. The program aims to build grassroots support for conservation through the use of a charismatic flagship species, as a symbol of local pride and as a messenger to build support for habitat and wildlife protection<sup>32</sup>.
2. **“Just Act Natural”** is an initiative of a local NGO, Youth to Youth in Health, and the Marshall Islands World Heritage Project to establish a conservation theatre program run by young people. The program will develop plays, skits and radio plays and perform in schools and in outer island communities to promote cultural and natural heritage, including biodiversity conservation.

Funding for education and awareness for conservation occasionally becomes available through various regional and international programs. It is important that as these opportunities arise, the resources are applied strategically to support the community-based conservation areas.

An area of immediate need is the development or purchase of education and awareness materials for use in outer island communities that are in the process of developing or implementing management plans.

**Notes:**

1. Groves et al. 2000.
2. Products from Coral Reef Millennium Mapping Project.
3. A record of all workshops and formal meetings is in Appendix I.
4. EEZ is a seazone over which each state has special rights over the exploration and use of marine resources. It is the area of water measured 200 nautical miles out from a baseline (low water mark), as defined by the UN Convention on the Law of the Sea (1982).
5. Richards et. al. 2002.
6. National Biodiversity Team of the Republic of the Marshall Islands. 2000.
7. Petrosian-Husa. 2004.
8. Jorelik Tibon in National Biodiversity Team of the Republic of the Marshall Islands. 2000.
9. Acronym for this name compiled from the names of member organizations: MIMRA, MIVA, RMIEPA, CMI and Ministry of Internal Affairs.
10. Groves. 2000.
11. Products from Coral Reef Millennium Mapping Project.
12. For a detailed discussion of these issues – the difficulty for conservation planners in determining how much to conserve, see Groves. 2003. Ch.6.
13. UNEP. 2004.
14. World Parks Congress, 2003.
15. Gell and Roberts. 2003.
16. Hughes et al. 2003.
17. Pew Fellows. 2005.
18. As defined in Section 3.1.
19. Micronesia Challenge commitment.
20. Micronesia Challenge commitment.
21. GBRMPA. Biophysical Operational Principles as recommended by the Scientific Steering Committee for the Representative Areas Program [http://www.gbrmpa.gov.au/\\_data/assets/pdf\\_file/0020/7337/tech\\_sheet\\_06.pdf](http://www.gbrmpa.gov.au/_data/assets/pdf_file/0020/7337/tech_sheet_06.pdf).
22. GBRMPA. Social, economic, cultural and management feasibility operational principles [http://www.gbrmpa.gov.au/\\_data/assets/pdf\\_file/0003/7338/tech\\_sheet\\_07.pdf](http://www.gbrmpa.gov.au/_data/assets/pdf_file/0003/7338/tech_sheet_07.pdf).
23. TNC. 2006.
24. TNC. 2007.
25. Thomas et al. 1989.
26. Puleloa et al. 1992.
27. Antarctic and Southern Ocean Coalition. [http://www.asoc.org/what\\_seamounts.htm](http://www.asoc.org/what_seamounts.htm). viewed August 2, 2007.
28. UNEP. 2004. Decision 7/V of the CBD.
29. Nancy Vander Velde pers. comm.
30. *Guidelines for Collection of Local and Traditional Knowledge on Natural Resources and Mo in the Marshall Islands*. See Appendix IV.
31. Kelleher 1999.
32. World Parks Congress 2003: Recommendation V/26.
33. Petrosian Husa. 2004.
34. <http://www.rareconservation.org/programs/> viewed September 24, 2007.

# Appendices



## Appendix II: References

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Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention on Wetlands). 1971. [http://www.ramsar.org/index\\_key\\_docs.htm](http://www.ramsar.org/index_key_docs.htm)

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Management of Marine Resources. MIRC Title 51.

National Environmental Protection Act 1984. MIRC Title 35 Chapter 1.

Coast Conservation Act 1988. MIRC Title 35 Chapter 3.

Endangered Species Act 1975. MIRC Title 8 Chapter 3.

Local Government Act 1980. MIRC Title 4.

Public Lands and Resources Act 1980. MIRC Title 9 Chapter 1.

Marine Zones and Protection of Mammals. MIRC Title 33.

## Additional Resources

Products from Coral Reef Millennium Mapping Project, Institute for Marine Remote Sensing at University of South Florida, USA, and Institut de Recherche Pour le Développement, France. Contacts: [andrefou@noumea.ird.nc](mailto:andrefou@noumea.ird.nc). The Project has made use of these products in the development of the reef classification system for the RMI Conservation GIS.

## Appendix III: Conservation Targets and Goals

a. Coarse-Scale Conservation Targets and Goals				
Broad categorization of habitats and ecosystems that encompass all the biota of the Marshall Islands.				
Target	Description & Importance for Conservation	Type I Goal	Type II Goal	Special issues
<b>Terrestrial</b>				
Agroforests	Modified forests typically of coconut, breadfruit and other species. Includes all other agriculture such as taro pits. Includes currently managed and unmanaged areas.	50%		For managed agroforestry, Effective Conservation implies that there will be no change in land use in that area.
Indigenous broadleaf forests	Indigenous tree forests in any stage of natural succession. Includes mixed species with understory vegetation, beach strand vegetation and monodominant climax communities. Will include modified areas where natural succession processes have become re-established.	20%	10%	As a dynamic system, the challenge will be keeping any one stage from becoming dominant.
Wetlands	Ponds, mangroves and inland depressions - brackish and freshwater.	80%		
<b>Marine</b>				
Deep lagoon	Lagoon below approximately 30m depth. Lagoon bottom communities often unknown. Sand depositions and movement important for atoll building, circulation, etc.	30%	0-5%	
Lagoon pinnacles	Areas of coral encrusted limestone pinnacles rising from the bottom of some parts of some lagoons. These structures are associated with higher species numbers and biomass than lagoon areas that lack pinnacles. Biological resources specific to lagoon, aggregation sites for megafauna, rare corals (e.g. <i>Acropora rongelapensis</i> is from a pinnacle).	30-40%	0-15%	Heavy pressure as usually fishing grounds.
Lagoon slope	Area in the lagoon adjacent to the intertidal reef flat to a depth of approximately 30 meters. Characteristic sheltered or medium-energy lagoon biota associated with the more protected environmental conditions and more limited water exchange, characterized by large patches of sand and patch reef (bommies).	50%	0-15%	Fishing pressure, pressure, high visibility to community
Ocean leeward reef liklal	The reef on the leeward side of the atoll (typically the south-west half) extending from the seaward edge of the intertidal reef flat downslope to a depth of 100 meters (Micronesia Challenge definition). Characteristic medium to low -energy outer reef biota associated with the more protected environmental conditions than on ocean windward reefs.	30-50%	0-10%	
Ocean Reef	Shallow oceanic coralline bank independent of any atoll or island. Occurs both east of Mili Atoll and west of Bikar atoll. Expected to have important and unusual biodiversity.	100%		

Target	Description & Importance for Conservation	Type I Goal	Type II Goal	Special issues
Ocean Seabed	A variety of ocean seabed features below 100 m depth. Diversity of habitats of which little is known.			5 nautical miles from atoll baseline under local government jurisdiction.
Ocean windward reef	The reef on the windward side of the atoll (typically the north-east half), extending from the seaward edge of the intertidal reef flat downslope to a depth of 100 meters (Micronesia Challenge definition). Characteristic high-energy outer reef biota that is subject to constant strong wave action, influencing the type of coral communities and associated species. Important for coastal protection as receives the brunt of weather.	30-50%	0-10%	Not many people go there for lack of boat. Seasonal management. Subject to outside threats.
Pelagic system	Open ocean free-swimming and floating organisms classified according to depth zones and water movement patterns. E.g. plankton, and tuna. Foraging and feeding areas, nursery grounds, spawning areas and migration routes for species of commercial significance for the Marshall Islands.			5 miles from atoll baseline under local government jurisdiction.
Reef flat	Includes ocean and lagoon side intertidal areas and shallow subtidal areas of the atoll rim. Characteristic high-energy shallow water biota, coastal protection. Important for shells for handicrafts and food	30-50%	0-10%	Prohibit quarrying 100% on reef flat on non-developed islands - high pressure as people have easy access
Reef pass and channel	The areas of highest marine 'biomass aggregation'. Ocean-lagoon water and nutrient exchanges result in high numbers of coral and fish species in and near to reef passes and, associated with these, an abundance of pelagic species. Water exchange areas, extremely rich biologically, important for water circulation around atolls, also important for shipping (and thus experiencing higher threats).	80-100%	0-30%	Some management needed for all passes

## b. Fine-Scale Conservation Targets/ Special Features

Important areas for species targets, rare or imperiled communities, places of cultural significance. These are targets considered worthy of conservation consideration that are not adequately dealt with under the coarse-scale targets above.

Target	Marshallese name	Description & Importance for conservation	Type I Goal	Type II Goal	Special issues
<b>Terrestrial</b>					
Bird Island		<u>Description:</u> Areas where birds congregate to roost, rest and/or nest. <u>Importance:</u> Protect bird life cycle for a range of land, sea and shore birds and migratory birds.	100%	50%	Important to protect the actual habitat - especially sand-spit islands from dredging. Major threat to birds is invasives. Half the bird islands on an atoll should be protected from harvest.
Breadfruit forest	<i>mā</i>	<u>Description:</u> An agroforest dominated by breadfruit ( <i>Artocarpus</i> sp.). <u>Importance:</u> food security, cultural significance, often a nesting area for endangered Micronesian pigeon, <i>Ducula oceanica</i> including ssp. <i>ratakensis</i> .	100%	0%	Conservation is critical for food security. Suggest that maintain or increase total area under breadfruit plantation, even if the location of the forest shifts.
Climax forest communities: <i>Pisonia grandis</i> and <i>Neisosperma oppositifolium</i> forests	<i>kañal (Pisonia) kōjbar (Neisosperma)</i>	<u>Description:</u> These forest types, now rare on Pacific atolls, was once widespread and is now found only where traditional <i>mo</i> prohibitions have prevented damage or clearance. <u>Importance:</u> rarity, preferred habitat for the nesting of certain birds, usually associated with <i>mo</i> .	20%	10%	These communities should be considered simply as one stage (the final stage) of dynamic successive communities. Thus, if not impacted by human activity, they are subject to disturbance from typhoons and storm surge.
Mangrove area	<i>joñ, bulabol and kimeme</i>	<u>Description:</u> Mangroves in the Marshall Islands are almost entirely inland, not coastal, and more common in the wetter, southern atolls. Many may have been introduced. Species differ from atoll to atoll and include <i>joñ (Bruguiera gymnorrhiza)</i> , <i>bulabol (Sonneratia alba)</i> and <i>kimeme (Lumnitzera littorea)</i> . <u>Importance:</u> They are locally important as fisheries habitat, dye, canoe building and traditional garlands.	90%	-	
<i>Pemphis acidula</i> forest	<i>kōñe</i>	<u>Description:</u> A plant community dominated by an extremely hardy shrub or tree growing in a harsh, rocky environment alongside the sea. Some specimens up to 5ft in circumference could be many hundreds of years old. Is both a pioneer and climax species and is possibly the initial stabilizing vegetation for the land formation of the Marshall Islands. <u>Importance:</u> erosion control, rarity, wood source for firewood and building.	100%	50%	Large specimens of <i>Pemphis acidula</i> should all be protected

Target	Marshallese name	Description & Importance for conservation	Type I Goal	Type II Goal	Special issues
Pond	<i>pat</i>	<u>Description:</u> Inland fresh or brackish water pond. Rich with land crabs, shrimps, mangrove crabs, and it is a rich spawning and feeding area for reef fish and fresh, brackish and salt water crustaceans. <u>Importance:</u> Surface freshwater is rare. Biodiversity of ponds and swamps is rare and contains endemic snails and shrimp. endemic. Resting for migratory birds.	60-80%		
Shrubland and grassland		<u>Description:</u> Species of low stature ( <i>Boehavia spp.</i> , <i>Portulaca spp.</i> , <i>Sida fallax</i> , <i>Lepturus repens</i> , <i>Cyperus spp.</i> etc.) – primarily on northern atolls. <u>Importance:</u> important unique habitat, seabirds nesting habitat, includes endemic grass species on Bokak ( <i>Lepturus gasparricensis</i> ).	100%	50%	Need to protect representative examples of distinctive wetlands as these are globally unique ecosystems and have high levels of undescribed endemism.
Turtle nesting beach		<u>Description:</u> Nesting beaches for green sea turtle ( <i>Chelonia mydas</i> ) and hawksbill turtle ( <i>Eretmochelys imbricate</i> ). <u>Importance:</u> Protect turtle reproduction for both these species of threatened turtles.	100%	100%	Nesting turtles and eggs already in legislation. Important to protect actual beach from erosion, dredging and human disturbance.
Windward forest	<i>jānar</i>	<u>Description:</u> A mixed forest of windward shores. Typically contains the species <i>Scaevola</i> , <i>Tournefortia</i> , wild <i>Pandanus</i> , <i>Guettarda</i> , <i>Suriana</i> (northern atolls). <i>Scaevola taccada</i> is often the most seaward and its labyrinth like drooping branches can effectively dissipate wave action. <u>Importance:</u> protection of water lens, coastal protection and land stabilization, protection from salt-spray and wind, provision of food resources in the form of planted edible <i>Pandanus</i> .	100%	-	Important to maintain the function of this forest for coastal protection.
<b>Marine</b>					
Clam site		<u>Description:</u> Areas with an unusual abundance of <i>Tridacna spp.</i> and/or <i>Hippopus hippopus</i> clams. <u>Importance:</u> as source population for surrounding areas.	50%	30%	Non-actively farmed sites protected as source for surrounding areas.
Fish spawning aggregation area (SPAG)		<u>Description:</u> Places where fish of a species occasionally aggregate to spawn. <u>Importance:</u> High importance to protect reproduction process to ensure recruitment, vulnerable to exploitation when aggregated.	100%	NA	100% of known locations of SPAGs protected seasonally for food, commercial and threatened or depleted species.

Target	Marshallese name	Description & Importance for conservation	Type I Goal	Type II Goal	Special issues
Point with extended ocean reef	<i>bōke</i>	<u>Description:</u> Extended ocean reef on point. On the reef flat, the extended rocky area is used for collection of edible mollusks. This is a popular area for women in the villages and this is the only type of "fishing" women were permitted to do in the old days. These areas are exposed during low tide but during high tide, these are submerged and become rich areas for reef herbivorous fishes that depend on the algae growth on the rocks. Deeper, these areas tend to be fish aggregation sites. <u>Importance:</u> fish aggregation sites, high biodiversity.	30%	-	
Reef hole	<i>nam</i>	<u>Description:</u> A deep biodiversity rich body of salt water partly or completely surrounded by reefs. Best area for night fishing for reef fishes and turtles. <u>Importance:</u> traditional and biological value.	30%	-	Protect from blasting/dredging for boat channels.
Seagrass meadow		<u>Description:</u> Area with seagrasses, usually in the lagoon. <i>Thalassia hemprichii</i> , <i>Cymodocea rotundata</i> and <i>Halophila minor</i> have been recorded. <u>Importance:</u> Nursery area for some species of fisheries importance, and grazing for green turtle.	100%	-	Further investigation should be done as to the ecological role of seagrasses in the Marshalls, and depending upon the findings, some protection may be advisable.
<b>Traditional Special Areas</b>					
Traditional reserve	<i>mo</i>	<u>Description:</u> Areas subject to a traditional chiefly taboo. <u>Importance:</u> Though resources are harvested intermittently from some of these areas, the fact that public access is forbidden and that vegetation cannot be cleared means that these areas are usually prime examples of terrestrial and marine biodiversity. Where reefs are subject to <i>mo</i> prohibitions they function as fisheries habitat and could be significant as larval sources and as nursery areas that enhance fisheries productivity in adjacent areas.	-	-	Maintain traditional management type.
Traditional special purpose area	<i>bwebwenato</i>	<u>Description:</u> 1. Areas and/or features associated with legends ( <i>bwebwenato</i> ); 2. Areas where traditional medicine is cultivated, harvested and/or administered; 3. graveyards ( <i>wuliej lap</i> , for chiefs). Other sites? <u>Importance:</u> Vegetation here is subject to little disturbance	-	-	Traditional management

Target	Marshallese name	Description & Importance for conservation	Type I Goal	Type II Goal	Special issues
Traditional Special Fishing Location	<i>lōb</i>	<u>Description:</u> Shallow body of water being partially bordered by an exposed coral reef during low tide. Much smaller and shallower than a Nam. <u>Importance:</u> traditional and biological value.	-	-	need to check if there is any traditional management
	<i>kolla</i>	<u>Description:</u> Shallow corals spots in the lagoon where turtles use for resting and sleeping at noon. Best hunting area for turtles. <u>Importance:</u> traditional and biological value			
	<i>wōd in ekonak</i>	<u>Description:</u> Certain lagoon pinnacles designated for fishing rainbow runners using traditional methods to catch the fish. Rich also with Tridacna giant clams. <u>Importance:</u> traditional and biological value			

### c. Species Conservation Targets

All Marshallese plant and animal species are of significance and efforts to conserve these for protection and use are always necessary. Some species however require priority attention and these have been listed below. The listing of each species is accompanied by an indication of its local, regional and international conservation status — the latter with reference to the IUCN red list.

Target	Marshallese Name	Conservation significance
<b>Terrestrial</b>		
Aquatic shrimp		Several species/ variants found in wetlands on Jaluit - possibly endemic to a single island or marsh area.
Arno skink		<i>Emoia arnoensis arnoensis</i> . Endemic / restricted range (endemic to Micronesia).
Horticultural species	<i>bōb</i> ( <i>Pandanus tectorius</i> clones), <i>iaraj</i> ( <i>taro</i> )	A number of varieties of <i>Pandanus tectorius</i> ( <i>bōb</i> ) are part of the Marshallese biodiversity heritage, many being endemic clones which were aboriginally developed. They cannot be maintained through seed but only through cuttings, hence are at risk of dying out. The giant swamp taro ( <i>iaraj</i> ) ( <i>Cyrtosperma chamissonis</i> ) is one of the most important traditional staples but is falling into disuse through the westernization of foodstuffs.
Land crabs	<i>atuñ</i> , <i>baru wan</i> , <i>barulep</i>	Three species are harvested; a <i>Cardisoma</i> species ( <i>atuñ</i> ), <i>Geographus crinipes</i> ( <i>baru wan</i> ) and the coconut crab, <i>Birgus latro</i> ( <i>barulep</i> ).
<b>Avifauna</b>		
Bristle-thighed curlew	<i>kuk-kuk/ kewak</i>	<i>Numenius tahitiensis</i> : Vulnerable-IUCN.
Great Frigatebird	<i>toulōñ</i> ( <i>f</i> ), <i>ak</i> ( <i>m</i> )	<i>Fregata minor</i> : of cultural importance to Marshallese.
Micronesian pigeon (including the Ratak subspecies)	<i>mule</i>	<i>Ducula oceanica</i> : Near Threatened - IUCN. and <i>D. oceanica ratakensis</i> : Endangered species RMI law, Species of Concern, USFWS, Restricted range known only in eastern Micronesia.
Short-eared owl		<i>Asio flammeus</i> : the whole species is IUCN (BirdLife International) Lower Risk/least concern; if it is the subspecies <i>ponapensis</i> , it would be regionally endemic and considered to be Candidate for Listing by the USFWS.
Short-tailed albatross		<i>Phoebastria albatrus</i> : Vulnerable-IUCN.
<b>Marine</b>		
Bigeye tuna	<i>bwebwe</i>	<i>Thunnus obesus</i> : Vulnerable IUCN
Black-lipped pearl oyster	<i>di</i>	<i>Pinctada margaritifera</i> Commercially important to RMI black pearl industry. (currently has a closed season under MIMRA Act MIRC Title 51 Para 217)
Bumphead parrotfish	<i>mem</i>	<i>Bolbometopon muricatum</i> : Bumphead parrot fish, the largest of parrot fish in the Marshalls.
Cetaceans		All species of whales and dolphins. RMI legislation currently identifies the following: (Marine Mammal Protection Act, MIRC Title 33 Ch. 2) These are also listed as Lower Risk/ Conservation dependent by IUCN. Pantropical spotted dolphin - <i>Stenella attenuata</i> (and subspecies/ forms); Long-snouted spinner dolphin - <i>S. longirostris</i> (and subspecies/ forms); Common dolphin - <i>Delphinus delphis</i> ; Striped dolphin - <i>S. coeruleoalba</i> . And any other species of small toothed cetaceans, captured in the course of commercial fishing operations in the eastern tropical Pacific Ocean.
Cowries and other shells	<i>libuke</i>	Various species harvested for use in handicrafts. Are there any species that are rare/ threatened?
Fisheries target species		e.g. convict tang, rabbitfish, groupers etc. Are there any species shown to be declining?

Target	Marshallese Name	Conservation significance
Game fishes		Marlin, Mahi mahi, wahoo, tuna etc. Migratory species. Important for tourism and sportfishing. (Currently protected under the MIRC Title 33 Ch.3 within a radius of Majuro and Kwajalein)
Giant clams		<i>Tridacna gigas</i> (kabwōr): Vulnerable-IUCN, <i>T.squamosa</i> (dirmouj) : Lower Risk /conservation dependent-IUCN ; <i>Hippopus hippopus</i> (tōtwōd): Lower risk/ conservation dependent-IUCN. <i>T.maxima</i> (jeno/ mejenwōd) food.
Giant grouper	kidriej	<i>Epinephelus lanceolatus</i> : Vulnerable-IUCN
Green sea turtle	wōn / jebake (brown color)	<i>Chelonia mydas</i> : Endangered-IUCN. Known to nest in the Marshalls. Cultural importance.
Hawksbill turtle	jebake	<i>Eretmochelys imbricata</i> : Critically Endangered-IUCN. Known to nest in the Marshalls. Cultural importance.
Lobster	wōr	Green Spiny Lobster ( <i>Panulirus penicillatus</i> ), Slipper Lobster ( <i>Parribacus antarcticus</i> .) and other spp.
Manta ray	borañ	<i>Manta birostris</i> : Near Threatened - IUCN. Charismatic megafauna - may be useful in raising awareness.
Napoleon wrasse	lappo	<i>Cheilinus undulatus</i> : Endangered-IUCN.
Other turtles	wōn	Pacific Olive Ridley Turtle - <i>Lepidochelys olivacea</i> : Endangered-IUCN. Loggerhead turtle - <i>Caretta caretta</i> : Endangered-IUCN. Leatherback turtle - <i>Dermochelys coriacea</i> : Critically Endangered-IUCN.
Rare coral species		Yet to be listed.
Sea cucumber	jibenben	Highly vulnerable to overharvesting. Populations elsewhere in the region are severely depleted.
Sharks	bako	Including but not limited to: Gray reef shark - <i>Carcharhinus amblyrhynchos</i> : Lower Risk/ near threatened - IUCN. Black-tip reef shark - <i>Carcharhinus melanopterus</i> : Lower Risk/ near threatened-IUCN. Tiger shark - <i>Galeocerdo cuvier</i> : Lower Risk/ near threatened-IUCN. Lemon shark - <i>Negaprion acutidens</i> : Vulnerable - IUCN
Spotted eagle ray	imel	<i>Aetobatis narinari</i> : Near Threatened - IUCN. Charismatic megafauna - may be useful in raising awareness.
Three-banded anemone fish	banij	<i>Amphiprion tricolor</i> – endemic species, and well-known in the Marshall Islands as an endemic species – (could be a flagship species for reef.) (and associated anemones <i>Stichodactyla mertensii</i> , <i>Heteractis crispa</i> , <i>H. aurora</i> and <i>Entacmaea quadricolor</i> .)
Whale shark	-	<i>Rhincodon typus</i> : Vulnerable-IUCN.

Notes:

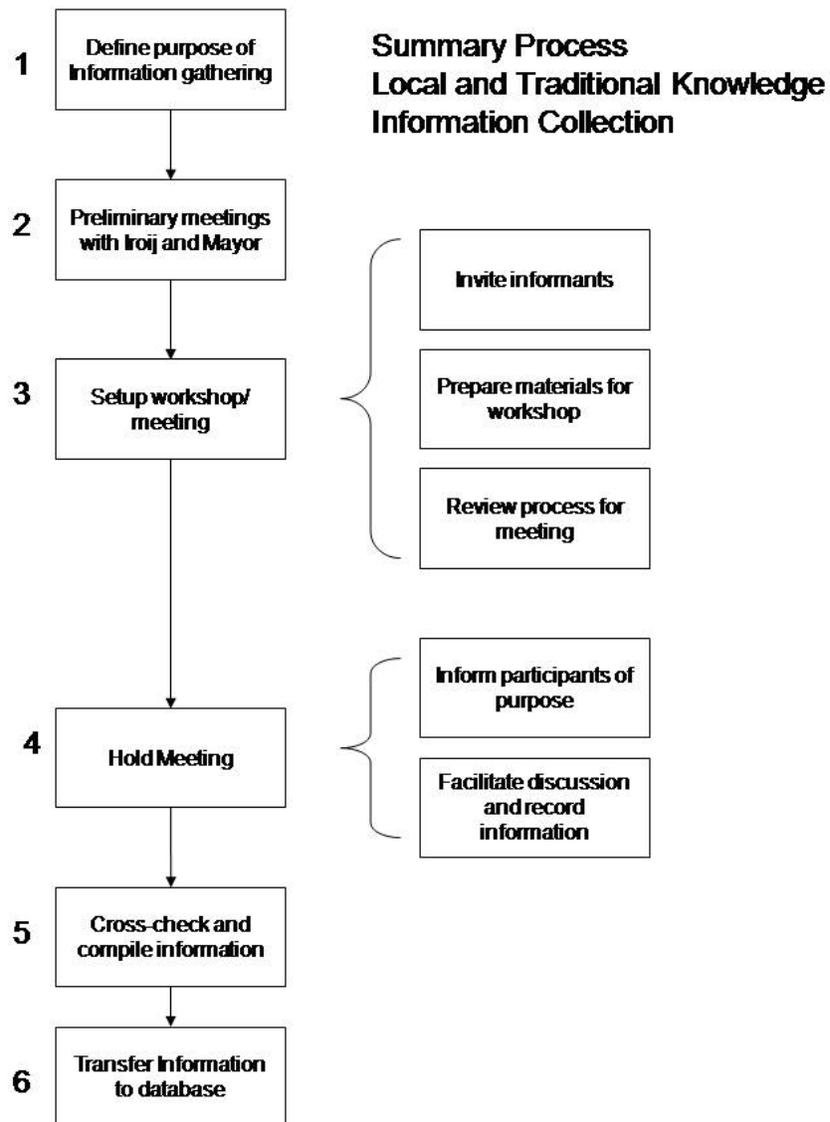
Status of species according to the IUCN Red List: IUCN 2006. 2006 IUCN Red List of Threatened Species. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 14 December 2006.

RMI is not party to CITES however reference should be made to CITES list in further development of this list.

# Appendix IV: Guidelines for Collection of Local and Traditional Knowledge on Biodiversity Resources and Mo

## Purpose of these guidelines

This document outlines key steps and guidelines for the collection of local and traditional knowledge on natural resources in the Marshall Islands. It was developed by local facilitators of natural resource management planning through a workshop in December 2006, and then was tested and refined through the process of collecting local and traditional knowledge to build the Marshall Islands Conservation GIS from January to May 2007. This document forms part of a larger toolkit for community-based conservation and resource-management planning in the Marshall Islands and should be adapted and added to on an ongoing basis.



# Process Steps

## 1. Define Purpose of Local and Traditional Knowledge Collection

There are various reasons for the collection of local and traditional knowledge on natural resources in the RMI including:

- a. Identification of places and species that should be targets for conservation and management;
- b. Empowering communities and encouraging their participation in developing resource management plans for their atolls, including conservation plans and fisheries management plans, by acknowledging the existence and value of their knowledge; and
- c. Documenting and guarding against the loss of traditional knowledge and resource management practices as part of Marshall Islands heritage.

Prior to a process for collecting information, it is important to be clear about the purpose and uses of the information. This will influence the following process. Consider the questions:

- What will be done with the information? How will it be used?
- Where and how will the information be stored?
- Who will have access to the information?

## 2. Preliminary Meetings with Iroij and Mayor

The appropriate way to access the community is through traditional and elected leaders. In addition, these leaders may themselves have good knowledge of the resources on their atolls. In particular, the *Iroij* is a key source for information about *mo*.

Preliminary meetings with the *Iroij* and Mayors should be held with the objectives:

- To fully inform them of the purpose of the information gathering,
- To gather preliminary information on resources and *mo*, and
- To gain access to knowledgeable people from their communities.

More than one meeting will probably be required in order to meet all these objectives. Meetings may also include advisors and representatives of the *Iroij* or Mayor.

## 3. Setup Workshop/ Meeting

### a. Invite informants

Make sure informants know the date, time and location. Make reminder phone calls. Direction from the Mayor or Iroij to the informant will be helpful to ensure the informant has the authority to give information.

### b. Prepare materials for workshop

Arrange for maps or charts of the atoll for the workshop.

Small format maps may be generated from the Marshall Islands Conservation GIS. Large format maps may be printed by RMIEPA or nautical charts may be used.

Prepare forms for recording of the information.

Simple data sheets are included in the toolkit or more detailed data sheets can be developed on an as-needs basis.

*Suggested materials:*

- Map
- Markers/ pencils
- Handouts of purpose of information gathering in Marshallese language
- Refreshments

### c. Review the process for the meeting

Who is the facilitation team? Is it one person? A pair? Determine who will be facilitating the discussion and who will be recording.

*It is often useful to have two people recording the information as different people will hear different things- gives you more complete information at the end when you compare. Can the facilitator also record the information? Should you debrief and review information directly after the meeting and capture anything that was not written during the meeting?*

*Who are your informants? How are they likely to interact? Do you need to separate groups (men/ women, traditional leaders/ dri-jerbal)?*

Make sure you have agreed roles and know the process for the workshop/ meeting.

#### 4. Hold Meeting

##### a. Inform participants of purpose

It is very important that informants/ participants understand the following:

- The larger context of the information gathering- what is it being used for? What is it a part of?
- How will the information be used? What happens to the information?
- Who will have access to the information?

This needs to be explained very clearly up front in order for the informants to have trust in the process, and also for them to decide what information to reveal and what to keep to themselves.

In this case, the context of the information is that we are working with communities and leadership to collect information for use in conservation/ resource-management planning. This is to assist the RMI to manage the resources sustainably. It DOES NOT mean that the national government will be declaring any protected areas or restrictions. This will always be done through the local community and local leadership. The information the informants give us will help identify species and places of importance in terms of biodiversity. The information will be put into a document and a database and will be accessible to government agencies and those people interested in conservation and resource management in the Marshall Islands.

**Sensitive Information** As the information collected is difficult to keep confidential, we do not wish to know the precise locations of special fishing areas or fish aggregation sites, or other very sensitive information. The informants may be willing to indicate a range or vicinity in which fishing and fish aggregation sites occur. When information collection is done in more depth at the atoll level, while developing management plans, this sensitive information may be discussed more openly. The use and dissemination of this information may be restricted only to the community of that atoll in line with their wishes, or it may be added to the Conservation GIS and made more widely available.

##### b. Facilitation

Good facilitation is critical to the process of information gathering to ensure good quality of information and also to effectively engage the community and informants in the management of their resources. Some key elements of effective facilitation include:

- **Appropriate dress**
- Create an environment of **openness and trust**
- **Encourage participation** and engagement- watch your participants and make sure no-one is “dropping out”
- **Body language**- open, relaxed

- **Questioning**
  - o *Open questions* to invite detailed responses
  - o *Closed questions* to confirm
  - o Be careful to not ask *leading questions*
- **Paraphrasing**- repeat back to the person what they said, using different words and then ask for confirmation “is that what you mean? Is there something you would like to add to that?”
- **Use the map** as a focus for discussion- and ensure you draw out all the relevant information through discussion.

*Opportunities for the development of facilitation skills and training should be pursued.*

#### **c. Record Information**

In general, spatial information will be recorded on a map, and a detailed data table will accompany the spatial location.

#### **d. Cross-check and compile information**

After each meeting, cross-check information with your co-facilitator and agree on the information collected.

If several meetings are held around the same atolls and resources, cross-check the information between meetings and different informants.

#### **e. Transfer Information to Conservation GIS**

A procedure for entering information into the Conservation GIS is to be developed.

### Information to be targeted for collection:

#### ***Marshallese Names***

Check names of islands, reefs and other atoll features- spelling etc.

#### ***Background Socio-Economic Information***

What are your main sources of food? (local harvest, imported, marine, agricultural)

What are your main sources of income? (fishing, copra, handicrafts, medicine, store, remittances, etc)

#### ***Biodiversity***

In general, local knowledge of locations, species, seasons and relative abundance will be extremely valuable in identifying areas for conservation focus. Information gathering on biodiversity will target:

- a. Threatened species** (of global conservation importance);
- b. Species of local economic importance** (i.e. commercial and subsistence fisheries, food, handicrafts, medicine, sport fishing and diving attractions where applicable)
- c. Species of cultural significance** (ie those with stories “*bwebwenato*” attached, medicinal plants).
  - What species are important? (note: prompt for known species of cultural/ economic importance)
  - What species of fish spawn in the atoll?
  - Where are they located?
  - When is the season?
  - How many/ abundance? Has abundance of species changed? How?

Include consideration of:

- Turtles- Where are nesting beaches, feeding areas? What species? What time of year do they nest/feed? How many?
- Reef fish- Where are spawning aggregation areas (not specific locations)? What species? What time(s) of year? Abundance?
- Transient fish- Where are spawning aggregation areas? What species? What time(s) of year?
- Coconut crabs- Where are the areas of high abundance?
- Giant clams- area of high abundance
- Trochus/ shells- area of high abundance
- Sharks
- Bird- species, location, seasons, abundance
- Napoleon Wrasse

## Resource Use

Identify all main forms of resource use including:

***Fish***

***Shellfish***

***Turtle***

***Birds***

***Sand, aggregate/ rubble***

- What is harvested?
- Where is it harvested?
- Is it for household use/ trade/ sale or for commercial use?
- When is the harvest time?– what time of year? Every year? Special occasions? How often?
- How is it caught/ harvested? What fishing gear is used? (eg what fishing method? turtles taken in water or on beach?)
- How are medicinal plants, pandanus coconut harvested?
- Who harvests it? (division of labour between men and women? youth?)
- Traditionally, who is allowed to harvest?
- Why is it harvested? What is the purpose of the harvest?
- How do you use it?
- Where do you NOT go fishing (because it is too far)?
- Where is there ciguatera?
- Where do you catch the most fish? Where are the main fishing areas? (Where are the best fishing spots?)
- Are there commercial fishing activities?
- Where are the recreational sites?

## Environmental Issues/ Threats

- What? (e.g. dredging, erosion, waste, illegal/ over fishing, forest/ wood collection)
- Where does it occur?
- Who is carrying out the activity?
- Why is the activity occurring?
- What species are declining? Describe the decline.

## Special/ sacred places, mo (taboo)

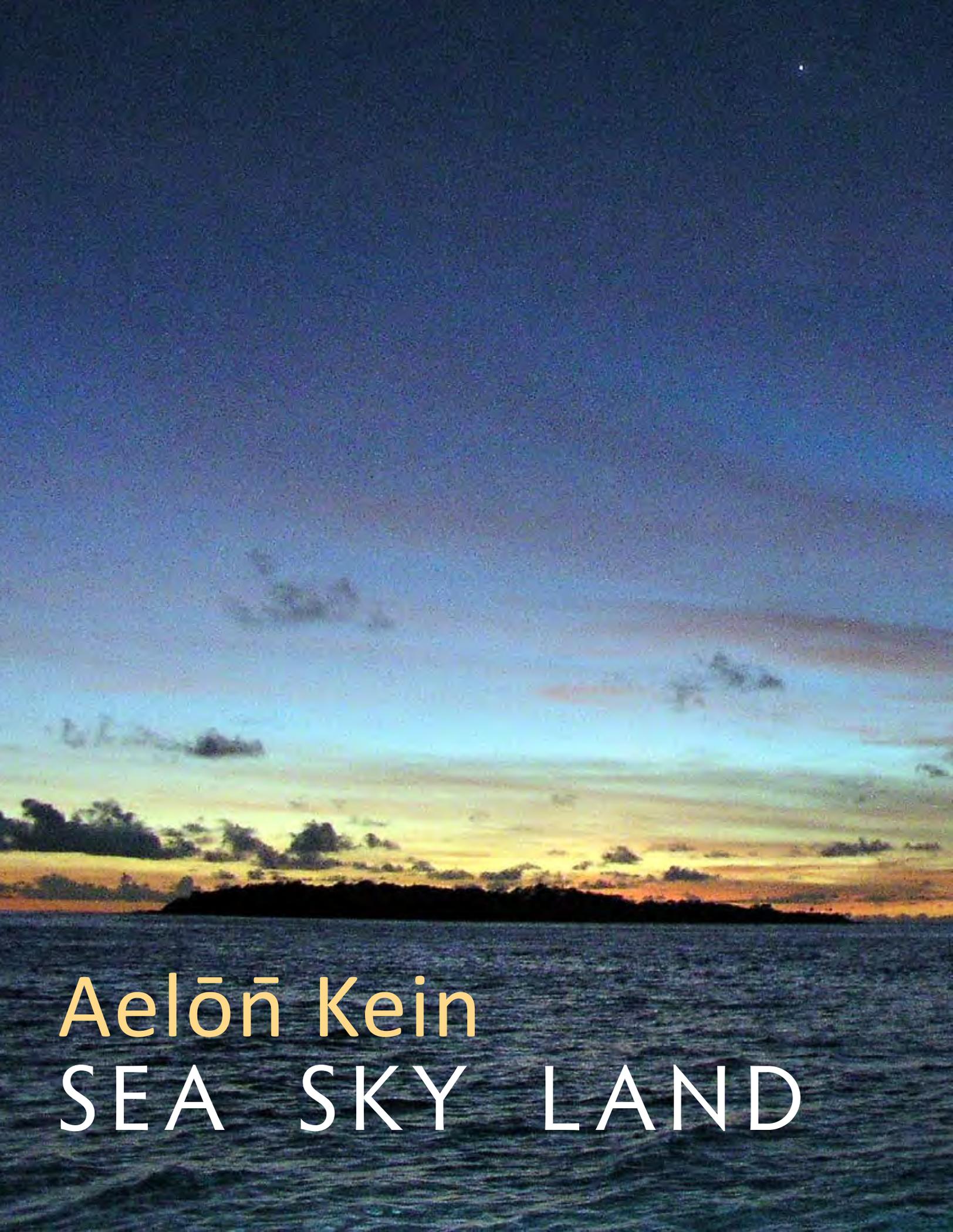
- Where are the special places?
- What elements comprise mo? What rules are there?
- What are the stories of the special place?
- Who controls the place? Who are the Iroij and Alap? (How long and why?) Who makes decisions about mo?
- How do you take care of this special place mo?
- Does mo ever get relocated?
- What is the status (i.e. do people know the rules and respect them?) Do people know the rules of the mo? Do people observe the rules of the mo? Are the rules enforced? By who? (Can you rate/ describe the extent of your traditional management efforts?)
- When visitors come, do you tell them about special places?
- Where are you not allowed to go?
- What species are abundant at the mo? What types of resources are in the mo?
- What traditional *bwebwenato* are there with regards to water and land? Where is the *bwebwenato*?

## Current Conservation Practices

- Are there any conservation practices in place?
- Are there any local ordinances or community rules relating to fisheries or conservation?
- Are there any traditional conservation/ management practices being used? What, where, how?

*It will take a long time to cover all these questions and discussions with informants and groups within the community. Consider breaking this discussion into parts and exploring them on different days during a community visit. Use this list as a checklist to guide your discussions.*





Aelōñ Kein

SEA SKY LAND