Republic of the Marshall Islands
"State"-Wide Assessment and Resource Strategy
2010-2015+

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Table of Contents

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VI Maps of current conditions and priority areas *(on CD as separate .jpg documents)*

Ailinginae, Bikini, Rongelap, Rongerik atolls
Ailinglaplap atoll: inset 01 (western islets)
Ailinglaplap atoll: inset 02 (eastern islets)
Ailuk atoll
Arno atoll
Arno atoll: inset 01 (northwestern islet)
Arno atoll: inset 02 (western islet)
Arno atoll: inset 03 (southwestern islet)
Arno atoll: inset 04 (southern islet)
Arno atoll: inset 05 (eastern islets)
Aur atoll
Jaluit atoll
Jaluit atoll: inset 01 (Javor)
Jaluit atoll: inset 02 (Jaluit Jaluit)
Kwajelein atoll
Kwajelein atoll: inset 01 (Ebeye)
Kwajelein atoll: inset 02 (northeastern islets)
Likiep atoll
Likiep atoll: inset 01 (northwestern islets)
Likiep atoll: inset 02 (eastern islets)
Likiep atoll: inset 03 (northeastern islets)
Majuro atoll
Majuro atoll: inset 01 (Laura)
Majuro atoll: inset 02 (D.U.D.)
Majuro atoll: inset 03 (Long Island)
Maloelap atoll
Maloelap atoll: inset 01 (northeastern islets)
Maloelap atoll: inset 02 (northwestern islets)
Mili atoll
Mili atoll: inset 01 (northwestern islets)
Mili atoll: inset 02 (southwestern islets)
Wotje atoll
Wotje atoll: inset 01 (northern islets)
Wotje atoll: inset 02 (eastern islets)

I Introduction

This "State"-Wide Assessment and Resource Strategy (SWARS) identifies the Marshalls' highest priorities for forest resource management and needs for assistance from the United States Department of Agriculture (USDA) Forest Service (FS). State assessments and resource strategies are integral to the Forest Service's State and Private Forestry (S&PF) Redesign and required as an amendment to the Cooperative Forestry Assistance Act (CFAA), as enacted in the 2008 Farm Bill. Each "State" is required to complete a State Assessment and Resource Strategy within two years after enactment of the 2008 Farm Bill (June 18, 2008) to receive funds under CFAA. The 2008 Farm Bill also made the Republic of the Marshall Islands eligible for CFAA programs that are available to states, territories and commonwealths of the USA.

The Marshalls SWARS summarizes information from existing assessments and strategic plans; details may be found in those existing documents, which are attached as appendices. It thus includes two components to the assessment and planning required by the S&PF Redesign approach to identify priority forest landscape areas and highlight work needed to address national, regional, and state forest management priorities:

State-wide Assessment of Forest Resources—provides an analysis of forest conditions and trends in the state and delineates priority rural and urban forest landscape areas.

State-wide Forest Resource Strategy—provides long-term strategies for investing state, federal, and other resources to manage priority landscapes identified in the assessment, focusing where federal investment can most effectively stimulate or leverage desired action and engage multiple partners.

The SWARS provides a basis for subsequent annual grant proposals, as authorized under several CFAA programs. The Redesign deemphasizes program-by-program planning and emphasizes program integration to meet island priorities. The Marshalls' SWARS is thus organized around the Marshalls' own priority issues with respect to forests. Issues were defined by the advisory group to the "state" forester of the Marshall Islands Ministry of Resources & Development (MRD) as a way of organizing the goals and strategies most relevant to the island and to the SWARS. "Cross-cutting considerations" were also recognized by the advisory group, as threats, constraints and limitations that affected more than one issue.

Table 1 Marshall Islands priority issues (addressed by forests and trees) and cross-cutting considerations

Issues	Cross-cutting considerations
Biodiversity	Climate change
Food security and sustainable livelihoods	Freshwater resources
Coastal reinforcement	Capacity-building
Urbanization	Invasive plant species, pests & diseases

The SWARS then cross-references USDA Forest Service themes and objectives (Table 2) and specific funding programs and their requirements.

Table 2 USDA Forest Service National Themes and Objectives

1. Conserve Working Forest Landscapes
1.1. Identify and conserve high priority forest ecosystems and landscapes
1.2. Actively and sustainably manage forests

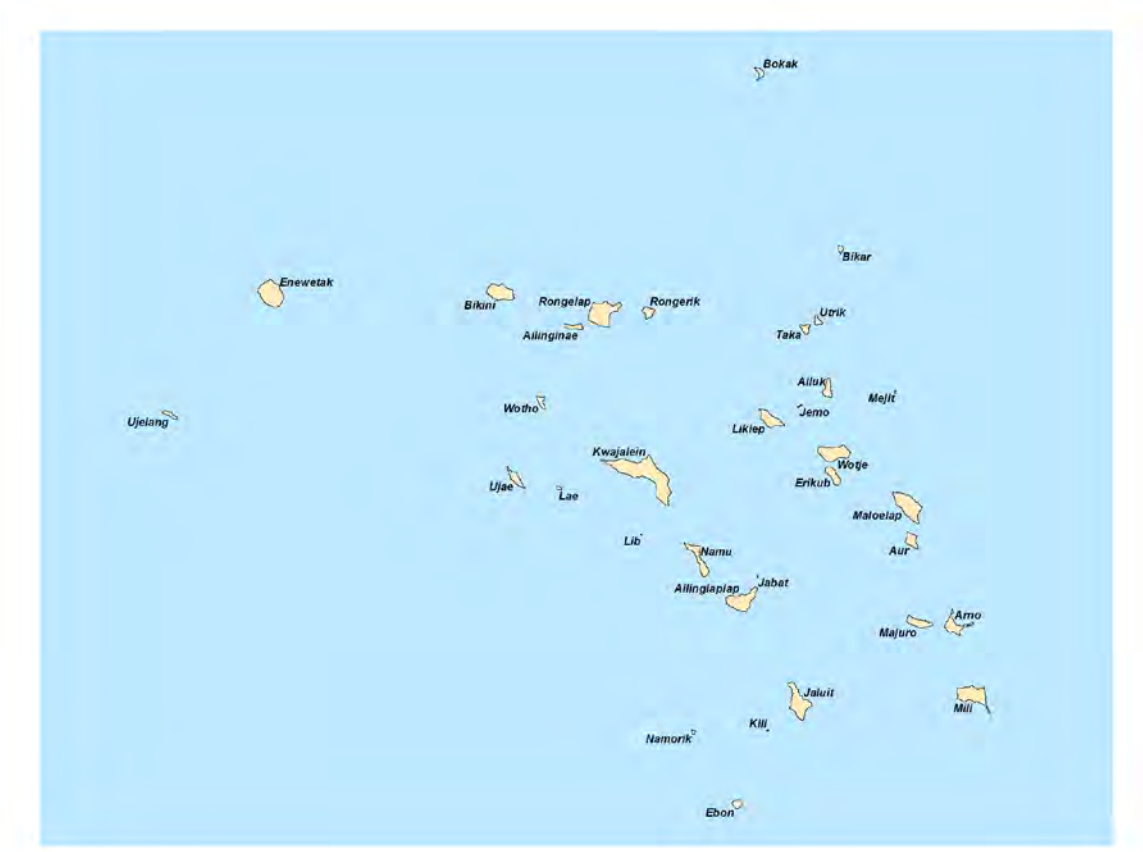
2. Protect Forests from Harm
2.1. Restore fire-adapted lands and reduce risk of wildfire impacts
2.2. Identify, manage, and reduce threats to forest and ecosystem health

3. Enhance Public Benefits from Trees and Forests
3.1. Protect and enhance water quality and quantity
3.2. Improve air quality and conserve energy
3.3. Assist communities in planning for and reducing wildfire/forest health risks
3.4. Maintain and enhance the economic benefits and values of trees and forests
3.5. Protect, conserve, and enhance wildlife and fish habitat
3.6. Connect people to trees and forests, and engage them in environmental stewardship activities
3.7. Manage and restore trees and forests to mitigate and adapt to global climate change

II Assessment of Forest Resources

Overall introduction: The Republic of the Marshall Islands is a former U.S. Trust Territory, now a sovereign nation in a "Compact of Free Association" with the U.S. As a result of its U.S. affiliation, it is eligible for all State & Private Forestry programs.

> …the Marshall Islands encompass 29 atolls and 5 solitary islands, and is comprised of approximately 1,225 individual islands and islets. These are situated from 160 degrees to 173 degrees longitude East, and between 4 degrees and 14 degrees latitude North. Total dry land area is only about 70 square miles. All the Marshall Islands are low in elevation; the average height of land above sea level being 7 feet. The air is warm and moist, with a humidity of about 80%, with considerable salt spray as well. The air temperature averages around 82 degrees Fahrenheit, ranging between about 76 and 90 degrees. Rainfall tends to be seasonal. It can range from as much as 160 inches in the south to as little as 25 inches a year in the north – or even less during the extremely dry years when there may be no precipitation whatsoever on some of the drier atolls. Tropical storms (typhoons) are fortunately relatively rare, but when they do hit, can be devastating. [3]



Map #1 Republic of the Marshall Islands: See also detailed maps of each atoll.

[3] National Biodiversity Team of the Republic of the Marshall Islands. 2000. "The Marshall Islands – Living Atolls Amidst the Living Sea: The National Biodiversity Report of the Republic of the Marshall Islands." A Global Environmental Facility / United Nations Development Programme Project. 344 pages. (Printed copy provided as an integral part of this SWARS.)

***General forest conditions*:** The Marshall Islands are naturally tropical forested ecosystems, mostly converted to agro-forest over the millennia since settlement by the Marshallese people. Marshallese agro-forest is a mix of trees, woody shrubs and herbaceous species, managed for food and other forest products, notably breadfruit, coconut, pandanus, and bananas. Since Western contact, many areas have been managed as coconut plantations (often with other species intercropped, a simpler form of agro-forestry) and additional species have been introduced and integrated into the agro-forest (especially fruit trees).

Mapping and forest inventory conducted for the first time in 2008[4] shows that forest, including agro-forest and coconut plantations, covers about 70% of the Marshalls' land area.12% of the landscape was classified as urban land. See attached maps for forest, urban and other land cover classes. Species diversity is low; a total of 17 tree species and 45 understory species were measured on the FIA plots, with an average of four tree species per sixth-acre plot.

All forest land is privately owned under complex forms of land tenure.

Crosscutting consideration: Climate change

Global projections of sea level rise over the long term are potentially devastating to the low-elevation atolls of the Marshalls. Regional information about climate change effects over a planning horizon measured in decades is critical to planning for adaptation strategies, but is still not precise.

> …Small islands are vulnerable to sea-level rise, coastal erosion, extreme weather events, coral reef bleaching, ocean acidification, and contamination of freshwater resources with saltwater. The islands have experienced rising temperatures and sea level in recent decades. Projections for the rest of this century suggest continued increases in air and ocean surface temperatures in … the Pacific…, an increased frequency of heavy downpours nearly everywhere, and increased rainfall during the summer months (rather than the normal rainy season in the winter months) for the Pacific islands. Hurricane wind speeds and rainfall rates are likely to increase with continued warming. Island coasts will be at increased risk of inundation due to sea-level rise and storm surge with major implications for coastal communities, infrastructure, natural habitats, and resources... [Atolls] depend on freshwater lenses below the surface, which are recharged by precipitation. Changes in precipitation… are thus a cause of great concern. Sea-level rise also affects island water supplies by causing salt water to contaminate the freshwater lens and by causing an increased frequency of flooding due to storm high tides. Water pollution (such as from agriculture or sewage), exacerbated by storms and floods, can contaminate freshwater supplies, affecting public health.[5]

Measured sea level rise in the Marshall Islands chain is ~2-9 mm/yr from 1992-2009[6]. Rainfall, drought and sea level are strongly affected by ENSO (El Nino Southern Oscillation) processes,

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[4] Donnegan, J; S. Trimble; K. Kusto; O. Kuegler; B. Hiserote. Draft. The Republic of the Marshall Islands' Forest Resources, 2008.

[5] Regional Highlights from Global Climate Change Impacts in the United States. www.globalchange.gov/usimpacts Cambridge University Press.

[6] Fletcher, C. and B. Richmond. 2010 draft. "Climate Change in the Federated States of Micronesia: Food and Water Security, Climate Risk Management, and Adaptive Strategies." Numeric rates of sea level rise not quoted directly; read from map with color key.

but climate models do not agree on how ENSO patterns will change with continued global warming.[7] There have been several strong ENSO cycles in recent decades, so measured changes in rainfall and sea level rise in recent decades cannot necessarily be projected into the future. Storms and extraordinarily high tides occur with natural variability and are also amplified by climate change and sea level rise. Atolls, with their characteristic beach berms and depressed interiors, are sensitive to the frequency of surges overtopping those shoreline barriers. Increased frequency of overtopping events, exceeding required recovery times, will alter terrestrial ecosystems and agro-forests, and will leave islands uninhabitable well before sea level rise permanently inundates the island.

The movement of people between outlying and urban atolls, and between Majuro and the U.S., is affected by expectations of the effects of climate change and also other cultural changes as people seek jobs, education, health care and other aspects of modern lifestyles. An assessment of demographic change and decisions by municipal governments concerning the futures of their communities would be highly desirable to inform strategies concerning agro-forestry extension and natural resource management.

Crosscutting consideration: Freshwater resources

Native forest ecosystems and traditional agro-forest management are both dependent upon and protective of the freshwater lens underlying atoll soils. The maintenance of coastal forest windbreaks (to reduce salt spray and desiccation), the conservation of native and traditional tree species adapted to atoll conditions, the avoidance of irrigation and chemical fertilizers, and the maintenance of soil organic matter through vegetative cover and composting techniques, all protect the quality of existing freshwater resources and assist continued productivity where freshwater resources are limited or dwindling. MRD has chosen not to address freshwater directly as an "issue" in this SWARS, as this does not fall directly under its area of responsibility, but it is identified as a crosscutting consideration because MRD conducts all its activities to be conservative of water quantity and quality.

Crosscutting consideration: Capacity-building

The Ministry of Resources & Development is the government agency responsible for agriculture, energy, trade & investment, and small business development in the Republic of the Marshall Islands. The Ministry's Strategy and Action Plan (2005-2010), attached, underscores the importance of sustainable development in all sectors under the ministry's area of responsibility.

Currently the agriculture division has 6 full-time staff and 5 casual workers. The Assistant Chief of Agriculture and Livestock is also the State Forester. Clearly, there is a great need for capacity-building in agro-forestry; more trained personnel are needed to implement the Ministry's expanding agro-forestry program. To compensate for the lack of staff, MRD works cooperatively with other government ministries and agencies and relevant stakeholders to progress its work program. In certain instances, the Ministry contracts out these services to other providers.

[7] Fletcher C, and B. Richmond. *(as previously cited)*

Forest Service financial assistance to the Republic of the Marshall Islands Ministry of Resources and Development (MRD) is currently about $50,000/year (base funding); additional funding may be secured through a competitive process ($300,000 was awarded through MRD to the Marshall Islands Conservation Society (MICS) in 2009.

Crosscutting consideration: Invasive plant species, pests & diseases

Pests and diseases affect the health of native forests, agro-forests, coastal and urban forests, and therefore forest health management is a cross-cutting consideration.

Forest Inventory data[8] shows that approximately 37% of trees had some form of damage, most often damage by unspecified insects, and next most often damage by other vegetation, including vines.

The most comprehensive available assessment of invasive plant species conditions (a threat under both the biodiversity and food security issues) is available at the Pacific Islands Ecosystem at Risk (PIER) website[9], which is kept updated with information from ongoing monitoring by Vander Velde[10] for the MRD Invasive Plants program (supported by S&PF grants). Invasive species are listed for the nation and by atoll to the extent that surveys have been completed, with information about each species, but no ranking of the degree of threat of each species within the Marshall Islands. Vander Velde[11] considers the most destructive invasive plant species currently in the Marshalls to include *Casuarina equisetifolia*, *Turnera umbifolia*, *Bidens alba*, and several grasses including *Dactyloctenium aegyptium* (crowfoot grass).

The MRD Strategic Plan[12] in 2004 identified fruit flies, mealy bugs, and coconut scale as the insects requiring monitoring and surveillance because of their impacts on agricultural crops, including agro-forestry crops such as coconut and tree fruits. Based on landowner complaints, mealy bugs and fruit flies are getting worse.

The "Living Atolls"[13] assessment stated in 2000 that "So far, at least, the Marshall Islands have not suffered from invasive species to the totally disastrous extent of other places. No endemic species has yet been driven into extinction by the onslaught of exotics. [However,] …non-native species can bring with them diseases and parasites that can further harm native plants and animals. The ... infestations of the spiraling whitefly and mealy bugs are cases in point... Pesticides and herbicides are ... often used to control exotics, but... thin limestone soil makes the use of herbicides risky since these... can easily seem down into the valuable water lens."

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[8] Donnegan *et al (as previously cited)*

[9] Space, J., N. Vander Velde and B. Vander Velde. 2010. Plant Threats to Pacific Ecosystems – Information and Links from PIER: Marshall Islands. Pacific Island Ecosystems at Risk project, website http://www.hear.org/Pier/locations/pacific/marshall_islands/index.html

[10] Nancy and Brian Vander Velde, personal communication, 2010.

[11] Nancy and Brian Vander Velde, personal communication, 2010.

[12] Republic of the Marshall Islands, Ministry of Resources and Development. 2004. "Strategy and Action Plan 2005-2010."

[13] "Living Atolls," as previously cited.

Education is therefore critical to stop the introduction of invasive species and their movement from atoll to atoll.

A Issue: <u>Biodiversity</u>

Conservation of biodiversity in the Marshalls concerns terrestrial native species, especially endemic species and including migratory birds; traditional cultivars; and sustainable land management to protect the biodiversity and productivity of the species-rich marine environment. Concern from this issue is rooted in efforts to reconnect with traditional culture; interest of external scientists; and international commitments including the Micronesian Challenge.

Values: Terrestrial biodiversity values in the Marshall Islands include pan-Pacific species that are uniquely manifest as atoll ecosystems. Forest-associated wildlife includes a subspecies of the Imperial Micronesian Pigeon endemic to the Ratak chain of the Marshall Islands , a species of shrimp, the Arno skink, and about 25 insects often endemic not only to the Marshall Islands but to a specific island or wetland. The Marshall Islands' terrestrial plant species include about 80 native vascular plant species, of which only one (a grass) is endemic; however, biodiversity values include agro-biodiversity, a rich heritage of local cultivars of traditional species, especially pandanus and breadfruit. Sustainable land and urban management practices also avoid adverse impacts on near shore marine biodiversity, which includes many endemic fish species.

"The Marshall Islands – Living Atolls Amidst the Living Sea: The National Biodiversity Report of the Republic of the Marshall Islands" [14] (enclosed as an integral part of this SWARS, and called "Living Atolls" throughout this document) provides a non quantitative, unmapped assessment of the Marshalls' biodiversity of flora and fauna, including comprehensive species lists and species status as of 2000. Atoll-by-atoll overviews (pp. 45-51) provide very brief assessments of environmental conditions.

Specific locations with high biodiversity values (populations of valued species, rare assemblages or species, and relevant cultural sites) are now being identified and mapped using published literature, personal observations of experts, and local knowledge. Assessment is proceeding atoll-by-atoll as part of community-based assessment and planning work, relying heavily on local informants. "Reimaanlok: Looking to the Future; National Conservation Area Plan for the Marshall Islands"[15] (called Reimaanlok throughout this document) describes this assessment process in detail, along with maps for sample atolls. The team's work is ongoing, and currently available terrestrial data is shown in the atoll maps of this SWARS, with the exception of values such as turtle nesting sites and *mo*[16] which are kept confidential (unpublished) to protect them from poachers. Reimaanlok calls these "fine-scale" (localized) "conservation targets" (biodiversity values targeted for conservation); see Reimaanlok pp. 68-70 and "Living Atolls" pp. 61-65 for definitions/descriptions.

[14] National Biodiversity Team of the Republic of the Marshall Islands, 2000. *(as already cited)*
[15] Reimaan National Planning Team, 2008. "Reimaanlok: Looking to the Future; National Conservation Area Plan for the Marshall Islands 2007-2012." Published by: N. Baker: Melbourne. 79 pages. (Printed copy provided as an integral part of this SWARS.)
[16] "*Mo*", traditional reserves, are described by "Living Atolls" on pp. 26-27.

Table 3 Fine-scale terrestrial conservation targets

Marshallese	***English***
Mo	Bird Island (traditional reserve) ***(confidential)***
Bwebwenato	[mistranslated[17] in Reimaanlok as Traditional special purpose area]
Ma	Breadfruit forest
Kanal, kojbar	Climax forest (Pisonia grandis, Neisosperma oppositifolium)
Jon, bulabol, kimeme	Mangrove forest
Kone	Pemphis acidula forest
Pat	Pond
[not translated]	Native shrubland and grassland
[not translated]	Crab population
[not translated]	Turtle nesting beach ***(confidential)***
Janar	Windward forest

Benefits and services:

- Ecological services
- Rare species
- Endemic species
- Sustainable livelihood
- Traditional medicinal plants

Threats:

- Development resulting in habitat loss
- Loss of keystone species
- Unsustainable farming practices
- Loss of traditional conservation practices
- Invasive species introductions and effects continue at a steady pace despite some efforts at quarantine and eradication.
- Urban development and pollution
- Climate change and sea-level rise
- Still unknown long-term effects from nuclear testing
- Conflicting cultural perceptions. For example, *janar* (windward forest) is removed to provide "clean" (tidy) landscaping, views, and breezes.

Trends: Data is not available or has not been located. Forest inventory has only taken place once (and was not designed to detect rare species and populations) and initial community-based assessment and mapping is still underway.

[17] Thomas Kijiner, Jr., Secretary of MRD, personal communication 2010

Opportunities:

- The Micronesian Challenge and international donors are providing support for biodiversity conservation in the Marshalls.
- The Reimaanlok process will write management plans for all islands with conservation areas; plans have been written for a few so far; these plans may be reported as Forest Stewardship accomplishments (written plans for clusters of private landowners) once the program is further developed; community organization will be coordinated with the U&CF program.

Priority areas for forestry program outreach and activity. The Reimaanlok National Planning Team (2008) is pursuing a community-based process of designating conservation areas. Most conservation areas encompass both near-shore marine resources and terrestrial resources; designations as "subsistence only" or "special reserve" primarily reflect intentions for the marine resources, so both types are simply shown as "conservation areas" in this terrestrial SWARS. The enclosed atoll-by-atoll maps show all conservation areas designated to date which do include terrestrial resources. The "priority area" for the biodiversity issue of the Marshalls SWARS includes these areas and any conservation areas that might subsequently be identified through a community-based process. Table 4 shows, for any given atoll, whether the conservation area designation process has taken place or not. If the process has taken place but there is no conservation area on the map, then the community did not agree to any terrestrial conservation area.

Critical information gaps

- Community-based mapping and designation of priority areas has not taken place on most atolls (see Table 4). Implementation work on any atoll will also require a review of the resource assessment and conservation area designation, to address any errors, changes in resource conditions, or changes in community acceptance of conservation areas since initial fieldwork was conducted.
- "Coarse-scale terrestrial conservation targets" (ecosystem types of interest) listed by Reimaanlok National Planning Team (2008) ("agro-forests," "indigenous broadleaf forests", and "wetlands") are thus far mapped only as "land," while the Forest Service vegetation type maps thus far only map "forest" and non-forest types (range, urban, barren, water). Actual vegetation type mapping is therefore an information gap at both the Republic and project level.
- Many of the atolls have not been scientifically studied, or those which have been, were studied decades ago or only superficially. So for many, there are no baselines studies for starting points, and comparisons as to trends cannot be made.
- Not all species in the Marshall Islands are known. When some recent surveys have been made through the USDA Forest Health Program and other agencies by B. and N. Vander Velde, species previously unknown from the Marshall Islands have been reported, even some previously unreported for the region.
- Quantitative information about projected sea level rise and projected changes in local climate (both of which will affect terrestrial biodiversity) have a great deal of uncertainty. Predictions will become more accurate with (a) local direct monitoring of relative sea level rise, (b) improved world and regional modeling, and (c) commitments by larger nations concerning their carbon emissions.

- See Appendix A for an explanation of what imagery is and is not available.

Table 4 Status of mapping

Atoll name	Land cover classes (including "Forest", "Urban") mapped to date	Fine-scale conservation targets mapped to date	Conservation areas mapped to date
Ailinginae	No	Yes	Yes
Ailinglaplap	Yes	Yes	?
Ailuk	No	Yes	Yes
Arno	Yes	Yes	Yes
Aur	Yes	Yes	?
Bikini	No	Yes	Yes
Jaluit	Yes	Yes	Yes
Kwajelein	Yes	Yes	Yes
Likiep	Yes	Yes	?
Majuro	Yes	Yes	?
Maloelap	Yes	Yes	?
Mili	Yes	Yes	Yes
Rongelap	Yes	Yes	Yes
Rongerik	No	Yes	Yes
Wotje	Yes	?	?
other[18]	No	No	No

B Issue: <u>Food security and sustainable livelihoods</u>

Agro-forests are a source of subsistence goods and commercial products. Many Marshallese suffer from malnutrition and diabetes that could partially be addressed with increased agro-forest production. Marshallese family incomes are low; agro-forest production can reduce the need for purchases and bring in cash income.

Values, benefits and services:

- Food security. Breadfruit, pandanus (tree crops) and taro (a component of the agro-forest) are traditional staple starches.
- Nutrition. Fresh tree fruits avoid malnutrition and diabetes from unhealthy imported foods. Many traditional species and varieties have higher nutritional values than varieties bred for large-scale production.
- Import substitution.
- Fiber for handicrafts, an important source of income, especially for women.
- Copra (dried coconut)
- High value market crops: some rare pandanus cultivars could prove to be useful specialty crops

[18] Other atolls include Bikar, Bokak (Taongi), Erikub, Ebon, Enewetak, Jabat, Jemo Island, Kili, Lae, Lib Island, Mejit Island, Nadikdik (Knox), Namorik, Namu, Toke, Ujae, Ukelang, Utirik, Wotho

- Sustainability. Traditional agro-forest practices maximize soil organic material (compost), essential for water retention in sandy soils. Traditional practices do not add chemical fertilizers and pesticides to aquifers.
- Appropriate for the environment. The chemical composition of atoll soil does not allow the production of many crops that are grown on high islands or other tropical areas.

Threats:

- Loss of traditional agro-forestry practices
- Lack of awareness of nutritional values
- Invasive species, including those introduced as food crops or as ornamentals
- Clearing of forest in order to plant market crops, which are often unsustainable in the atoll environment
- Climate change (drought) and sea-level rise (salt water intrusion)
- Conflicting cultural perceptions such as the above mention of clearing land vs. shoreline protection, also gathering gravel for use around homes
- Insects and diseases (see College of the Marshall Islands, Land Grant for more information
- Excessive land clearing, mowing, burning etc. which removes protection and organic material inputs to the uppermost layers of soil, potentially rendering the soil less fertile
- Overuse of water for crops threatens the sustainability of underlying aquifers

Trends: While there has not been a formal comprehensive survey of agro-forests in the Marshall Islands in recent years, partial surveys indicate that agro-forests in the country are generally becoming less managed. In the last three to five years, however, there seems to be a growing interest among the general public on improving management and preservation of the country's agro-forests. This is due in a large part to better awareness by the general public of the importance of agro-forests.

Forest inventory data confirms that the national coconut resource is mostly in a cohort of mature plantation trees, indicating that sustained future copra production may require replacement of older senescing trees.[19]

In terms of local food production and consumption, the trend is mixed. While there has been increased interest in local production in the urban center of Majuro, the results are mixed in terms of consumption. In the urban centers, it is clear that younger Marshallese have an affinity for imported processed foods over local foods. A sustained awareness campaign on the health benefits of local food consumption must be prioritized if this trend is to be reversed.

In the outer islands, local food production has declined over the last 10 to 20 years due to urban migration. With a dwindling population base, many outer island communities no longer have the human resources to tend to the land. This has resulted in a decrease in local food production.

[19] Donnegan et al (as already cited)

Opportunities:

- The UN General Environmental Fund (GEF) has offered to pay for an invasive species coordinator within the Marshalls. OEPPC would likely be the agency to receive these funds and hire this coordinator. With this expanded capacity, MRD may request that the Forest Service expand its support to include invasive species control coordinated by OEPPC, informed by and in addition to the monitoring and detection contracted by MRD over the past several years. Roles should be sorted out as the MIIST develops strategic and action plans (currently there is only a regional plan including Marshall Islands content, for which no draft yet has been received within the country).
- The GEF has also provided a grant for Sustainable Land Management (which can include agro-forestry extension) to the OEPPC ($475,000 for 2008-2011) and is likely to continue to do so.
- There is also possibility of expanding existing sustainable land management activities through funding under the Copenhagen Accord. At present, however, there is limited information on the timeframe when these funds would be available as well as the level of funding.
- The MRD has submitted to the Asian Development Bank (ADB) a grant proposal for a nation-wide coconut replanting project. The Bank has indicated initial support for the proposal, and if approved, it is anticipated that the project will commence in the latter part of 2011.

Priority areas for forestry program outreach and activity. The priority area for this issue is considered all areas mapped "forest" in the enclosed maps, since this class is mostly agro-forest and no more detailed maps are available. Inhabited atolls (some atolls such as Rongerik, Ailinginae, Bikar and Bokak are uninhabited) are served by MRD agriculture extension and are considered part of the priority area. The most productive areas are generally the inner lands of an islet, especially the widest islets with the richest soil and deepest freshwater lenses. Priorities are placed generally according to the following relative weights (although data is not available in GIS format and therefore has not been mapped):

- Breadfruit - 80%
- Coconut - 90%
- Climax forest - 70%
- Mangrove area - 50%
- Shrubland and Grassland - 40%
- Windward forest - - 60%
- Traditional reserves - 40%
- Traditional special purpose areas - 40%

Critical information gaps:

- Maps of the most important underground water lenses (freshwater resources)
- Quantitative information about projected sea level rise and projected changes in local climate
- Many of the atolls have not been scientifically studied, or those which have been, were studied decades ago or only superficially. So for many, there are no baseline studies for starting points, and comparisons as to trends cannot be made.

C Issue: <u>Coastal reinforcement</u>

Coastal forests are those on the beach crest above high tide mark. Their root systems reinforce the beach "berm" or crest. To an extent, they can therefore resist coastal erosion, maintain berm height, and therefore minimize the occurrence of "overtopping" (surge of high seawater into depressed interior areas). (However, extreme events can always wash away forest, berms and even entire sections of sandy islands.) Coastal forests have been thinned and removed in many urban and rural areas, so their restoration and maintenance in their natural state is a "no-regrets strategy" and a first line of defense against the effects of sea level rise.

Values, benefits and services:

- Stabilize beach crest and avoid coastal erosion
- Windbreak protecting inner agro-forests from wind, desiccation and salt spray.
- Protection for rare, endangered and/or endemic species, subspecies and cultivars
- The species of this coastal reinforcement are often pioneer species which are ecologically needed before secondary species can become established

Threats:

- Land clearing including coastal forests, especially in urban areas.
- Urbanization
- Invasive species, especially *Casuarina* which is often inappropriately promoted as a wind break but is instead destructive in the atoll environment
- Construction of seawalls
- Indiscriminate beach "clean-up" efforts
- Tourism, removing the vegetation for better view of the sea, planting of "prettier" species. Coastal forests are usually not understood or appreciated for their ecological values.
- Climate change
- Pollution, locally generated and distant through drift
- Erosion and salt water inundation and excessive salt spray

Trends: Data is not available, but continued clearing can be observed.

Opportunities: The Marshall Islands Conservation Society currently has a large competitive grant to restore coastal forests. Marshall Islands High School began a pilot project to replant the coastal forest; a grant application has been made for a continuation of the project.[20]

Priority areas for forestry program outreach and activity: The priority area for this issue has been mapped as a 100-foot strip around the coasts of each island in the Marshalls. At the project level, education takes place where the strip is intact, and restoration takes place where this strip has been devegetated. Four atolls (Majuro, Kwajelein, Jaluit and Wotje) have been targeted by the current grant for initial outreach and restoration.

[20] N Vander Velde, 2010, personal communication; see Mark Stege for more information

Critical information gaps:

- Capacity to address and analyze accelerated erosion processes and to identify mitigation opportunities.
- Many of the atolls have not been scientifically studied; those which have been were studied decades ago or only superficially. So for many, there are no baseline studies for starting points, and comparisons as to trends cannot be made.
- Not all species in the Marshalls are known.
- Being diverse ecosystems, there are expected to be differences in species etc. between the southern wetter atolls and the northern drier ones.

D Issue: <u>Urbanization</u>

Urbanization is a result of migration and the adoption of Western patterns of living. A large proportion of the Marshalls' population is now concentrated on a few urban islands, with resulting reductions in forest cover and separation of people from the tangible and cultural benefits of forests.

Values, benefits and services of urban forests:

- Food (homegardens)
- Beauty
- Cultural awareness
- Shade trees
- Larger number of people can benefit and learn about local species than in the more rural areas

Threats to urban forests:

- Overcrowding, ultra-urbanization, as has occurred on Ebeye, Kwajalein and in parts of downtown Majuro, where trees are cut down to allow for more homes and concrete
- Invasive species, such as insect pests which can destroy trees.
- Changed sense of aesthetics, where plain concrete is viewed as better than "messy" plants
- More vehicles, need for more roads, parking lots, etc.
- Climate change, reducing available appropriate building areas, hence putting more pressure to cut down trees.
- People are often too busy with their jobs and other responsibilities to tend to gardens and trees
- Lack of organic matter inputs to enrich sandy soils; fire hazard from burning urban forest and agro-forest debris (that traditionally would have been at least partially composted). One such debris fire ignited and partially destroyed a school in Laura village on Majuro atoll; fire engines located in Rita, about 30 miles away, were not able to reach Laura in time.

Trends:

No data available. Although some tree planting continues, it likely cannot keep pace with the increase of number of trees being cut down to allow for more houses, other buildings, and parking lots.

Opportunities:

- As people generally do appreciate having trees and other plants around, more emphasis could be placed as to their value, not only for food, but also for their esthetics and value in stress reduction.
- To date, there has been no engagement with Public Safety. With the 2008 Farm Bill and eligibility for Cooperative Fire programs, MRD wishes to engage Public Safety with the goal of naming them as the primary cooperator with the Forest Service for these programs.

Priority areas for forestry program outreach and activity. The priority area for this issue has been mapped as all "urban" areas on the landcover type map. (However, Urban & Community Forestry funding may be applied to other issues in addition to "urbanization" per se.)

Information gaps:

- Further information should be found as to which trees and other forest plants are appropriate for the urban setting (i.e. trees that tend to grow too large and break up house foundations should be discouraged, ones that are slower growing and do not drop excesses litter would likely be preferred).
- It would be appropriate also to determine which would best survive in the tropical atoll urban setting.

I Forest Resource Strategy

Please note that the "priority area" for each issue is verbally described in the assessment above, under each issue. Maps of each atoll (as listed in the Table of Contents) show the priority area as it appears on multiple atolls. Note that further detail for several strategies is shown in other, existing strategic plans; see Appendix E for a list and description of several of these plans; see the Table of Contents for which plans are appended and are considered an integral part of this SWARS. See Glossary of Acronyms, Appendix C.

Table 5 Direct strategies

RMI's Issues	***Long-term Strategy & Marshalls plan with more information***	***Programs/ Partners that contribute***	***Resources Required***	***Forest service objective (Table 2)***	***Performance Measure***
Biodiversity	Organize, educate & build capacity in communities *(see below, "Urban" issue)*	(see below)	FAO and SPC can fund this and coordinate with MRD to show this as match for U&CF and FSP; <u>low</u> priority for direct S&PF funding.	(see below)	(see below)
	Map more detailed forest ecosystem types; map forest types and conservation values on additional atolls	Reimaanlok, FI&A, Forest Service mapping		Conserve (1.2)	#communities developing/ managing forests
	Protection of 'special reserves' and conservation areas (*See Reimaanlok and soon-to-be published Reimaanlok Field Guide for community facilitation)*	MRD, UCF, MC Initiative, MICS, EPA , OEPPC, Local Governments		Conserve (1.1) Enhance (3.5, 3.6)	Acres/% land under conservation (MC); Acres conserved for habitat; #people engaged
	Designate 'traditional land use' conservation areas (subsistence agro-forestry production and compatible income generation with sustainable practices) *(See Reimaanlok and soon-to-be published Reimaanlok Field Guide for community facilitation); see also strategies for Food Security (below) from MRD Five-Year Plan)*	MRD, MICS, MC, SLM, Traditional and local govt. leaders, community champions		Conserve (1.2) Protect (2.2) Enhance (3.5, 3.6)	Acres/% land under conservation (MC); acres of land managed locally for traditional use, invasive protection, habitat; # people engaged
	Invasive plant species, pests & diseases (see below)	(see below)	(see below)	(see below)	(see below)

Food Security and Sustainable Livelihood	Promote and increase production of agro-forestry including high value market crops; community extension and education *(See MRD Five-Year Plan: Agriculture Production Services as applied to tree crops – pp. 22-23)*	Reimaanlok, MRD, MICS and MC, SPC, FAO, SLM, SGP, Local governments	<u>High</u> priority for S&PF funding	Enhance (3.4, 3.6) Protect (2.2) Conserve (1.2)	% of pop. Benefitting from sustainable livelihood thru: health, education and standard of living;
	Rejuvenate Traditional crops - Promote drought tolerant variety of indigenous food crops. - Educate community, as with "Bob" festival *(See MRD Five-Year Plan as applied to tree crops, pp. 22-25)*	Reimaanlok, MRD, MICS, MC, SPC, FAO, local governments	<u>High</u> priority for S&PF funding	Enhance (3.7, 3.6, 3.4, 3.1) Conserve (1.2)	Increase or change in number of households access to traditional crops; #acres made more resilient
	Coconut "Tree of Life" Development: rehabilitation, replantation *(MRD Five-Year Plan, pp. 18-20)*	MRD, SPC, FAO, local governments	<u>Medium</u> priority for S&PF funding, as FAO will also fund this work	Enhance (3.4, 3.6) Conserve (1.2)	Increased # of acres/% of community owned coconut rehab sites. Increased # of pop. Benefitting from copra
	Invasive species - prepare & implement MIIST strategy & action plan - hire coordinator - prevention and control - public education - planning and monitoring - eradication at a minimum	RISC, PII, IUCN, MRD, RMIEPA, OEPPC, SPREP, SPC, MIIST & MICS	<u>High</u> priority for S&PF funding	Protect (2.2) Enhance (3.6, 3.3) Conserve (1.2)	% of identified areas with IS eradicated

(continued) Food Security and Sustainable Livelihood	Forest/agro-forest pests & diseases - Quarantine - Eradication and control programs; response plans - Bio-control[21] - Public education re quarantine - Monitoring & surveillance *(MRD Five-Year Plan, Plant and Animal Protection Services as applied to tree crops, pp. 24-25)*	MRD, SPC Seek more collaboration with College of the Marshall Islands	<u>High</u> priority for S&PF funding, except quarantine is funded by local $	Protect (2.2) Enhance (3.6, 3.3)	% of identified areas with pests & diseases controlled
	Urban home gardens - research on possible medicinal plants to grow - increase soil fertility - promote tree planting - survey on basic gardening needs *(See R&D Five-Year Plan as applied to tree crops, pp. 22-25)*	MRD, Local Govts., TTM (Laura Farm), NTC, MIVA, Wellness Center and MICS, WUTMI, USP medicinal plant book	<u>Medium</u> priority for S&PF funding, because SLM also funding this	Enhance (3.4, 3.6, 3.7)	Strategic plan for home gardens Increased # of home gardens
Coastal Reinforcement	Organize, educate & build capacity in communities	(see below)	(see below)	(see below)	(see below)
	Protection of Coastal Areas - Replanting of indigenous salt tolerant vegetations - Training and Capacity building for locals - Considering hard structures such as seawalls *(See U&CF Five-Year plans)*	USFS, MICS, MRD, RMIEPA, CMI-UH Sea-Grant, SPREP, SOPAC, Local governments	<u>High</u> priority for S&PF funding after current competitive grant ends	Enhance (3.7, 3.6, 3.3) Conserve (1.2)	Increase % of coastal vegetation grown in vulnerable sites within Ebeye, Majuro and Wotje. Increased cultural awareness. Acres of forest made more resilient.

[21] Currently SPC is providing technical assistance for distribution of "black beetle" bio-control agent for mealy bugs and black flies, but results have not yet been satisfactory.

Urbanization	Organize, educate and build capacity in communities - Organize municipal advisory groups - Recruit volunteers - Develop tree ordinances (including conservation area designations) - Community assessments & plans - Conservation education	MRD and all agencies in Advisory Council	High priority for S&PF (U&CF) funding	Enhance (3.3, 3.6)	#communities developing/ managing forests #people in environmental literacy & stewardship
	Home gardens	See above	See above	See above	See above
	Beautification & cultural awareness: - Pre and post assessments - Education and Awareness strategy *(See U&CF Five-Year plans)*	WUTMI, MICS, MIVA, MRD, Traditional & comm. leaders, Local governments	Low priority for S&PF funding	Enhance (3.6)	Change in general attitude towards plants and forests. #People engaged in stewardship.
	Schools - Promote School planting activities - Interest youth in careers in agriculture and agro-forestry - Pre and post assessments *(See U&CF Five-Year plans)*	MICS, MRD, FAO, MOE, MIVA, WUTMI, Traditional and community leaders, MOE	High priority for S&PF funding	Enhance (3.6)	Change in attitude and increased cultural awareness. #People in environmental literacy programs.
	Fire Planning & Education - Develop Marshall Islands fire plan and community plans - Education and Awareness in communities and schools - Promote use of organic/ composting instead of burning waste	MICS, MRD, MALGOV Potential NRCS	High priority for F&AM, WUI, U&CF funding	Protect (2.1) Enhance (3.3)	Decreased in # of forest fires; Increase % of ppl composting organic matters. #People in env. literacy programs.
	Fire Protection and Mitigation - Practical training of firefighters	Public Safety, MICS, MRD, MALGOV	High priority for F&AM funding & tech. asst.	Protect (2.1)	

Table 6 Overcoming Limiting Factors for the State Forester

Capacity Constraints	***Strategy***
Bureaucracy and Red Tape	Improved communications/relations between MRD and Ministry of Finance; 2010 S&PF review
Human Resources	Increase partnerships with NGO's and Community members Increase program, agency & partner coordination *(see below)*
Training	Training of State Forester for Arborist Certification Training of more agro-foresters

Basis for future program, agency and partner coordination

The Coastal Management Advisory Council (See Forest Stewardship Committee, Appendix B) will be playing a key role in the coordination and assistance of the implementation of the SWARS with communities across the Marshall Islands. Partnership amongst key member agencies and is key to the success of the Council. Part of the Council's delivery is through a community focused marine science certificate course that is being offered exclusively to conservation officers in the Outer Islands. This year, the program will expand further to include water quality and terrestrial resource management.

The current Marshalls-wide Urban & Community Forestry Council has lost several members to emigration, and several of its remaining members are already part of the Coastal Management Advisory Council. Therefore, it will be rejuvenated by merging its mission and membership with the Coastal Management Advisory Council. The existing Ebeye and Majuro U&CF Tree-Planting Advisory Boards will continue, and the U&CF system of developing municipal/atoll "tree boards" will be coordinated with the Reimaanlok approach of organizing community consultation.

The Council will serve as an advisor, facilitator and reviewer of projects that address priority SWARS strategies, especially those that can best be implemented by or with other agencies and communities. When MRD receives Funding Advice and call letters for competitive S&PF funding, MRD will disseminate the information through the Council and to communities, requesting proposals for those activities that fulfill SWARS priorities. MRD will screen proposals with advice from the Council. Funds or in-kind assistance may be provided by MRD directly to partners (small projects) or MRD may request that funds be granted directly to partners (as for the competitive grant to MICS).

The Council will serve as a coordination mechanism when large strategic planning and proposal-writing efforts are required by other external donors with natural resource mandates coinciding with Forest Service assistance, for example, the Sustainable Land Management project (see "Opportunities" under the "Food Security" issue). The purpose of coordination will be to set priorities, share resources and information, and avoid duplication of paperwork and projects.

Monitoring outcomes within priority forest landscape areas and how action will be revised when needed

According to Reimaanlok, conservation activities (biodiversity issue) will be reviewed for progress annually and a complete review will be carried out in 2012. Review to date has led to a new field guide that will soon be available, with tools for the national team to use during community facilitation. In the current review process, Reimaanlok is also integrating climate change issues (looking at conservation through a climate "lens").

MRD will require partners to report progress in formats compatible with the reporting MRD gives to the Forest Service. MRD will review progress with advice from the Council.

IV Appendices

Appendix A: Methodology for assessment & geospatial analysis

Source Data

- from USFS R5 FHP Davis
    - Land Cover Types
        - created based on QuickBird (Satellite) imagery by the FHP Davis team (2008)
    - Coastal Buffer Zone
        - based on the atoll land boundary lines generated from the FHP land cover data
        - by buffering inland 70-feet and outwards 30-feet into the ocean

- from Karness Kusto[22] (these layers were created by Caleb McClennan, 2010[23], for Reimaanlok); mostly digitized based on various satellite imagery, and described as "*for display and informational purpose only."* Maps of these data had only been published in Reimaanlok for sample atolls.)
    - Airports
    - Point (Fine-Scale) Conservation Targets. Fine-scale targets were mapped as points, though one point might characterize the entire islet.
    - Protected (Conservation) Area (Type I & Type II). A discrepancy was noted between Type I and Type II conservation areas, in the printed Reimaanlok compared to the metadata; the difference in management strategy between the types was determined to be irrelevant for terrestrial portions of the conservation areas.
    - Coarse-Scale Conservation Targets (Areas) – polygons. Three different terrestrial coarse-scale targets were described in Reimaanlok, but were all mapped as the same class (land) in the GIS data; therefore "land cover types" (described above) provided more detail for terrestrial areas.

Method[24]

- Software
    - ESRI ArcGIS 9.3
    - Windows XP with Service Pack 3
- Process
    - We started with a set of overview maps created with only the FHP landcover data, while in the mean time searching for available data layers for RMI.
    - Data searching turned out very few results other than a set of digitized maps created by Caleb McClennen based on satellite imagery, which we decided to use for this SWARS reporting.
    - After the first draft of overview maps were reviewed, comments were gathered and the second round of maps were produced with the McClennen layers.

[22] State Forester, Republic of the Marshall Islands, personal communication 2010
[23] Personal communication; currently Director for Marine Conservation, Wildlife Conservation Society, New York.
[24] Mapping done and metadata documented by Zhangfeng Liu, 2010.

- The third revision of the maps was focused on determining exactly which maps to produce, the map layouts, styling (color, elements, etc.), and contents. Major changes including the use of separate maps for previously insets only contents and simplification/modification of symbology.
- The maps went through two more revisions after each new set of maps were reviewed and new comments were made. The final fine-tuning is all about making the maps look better and all the map elements are exactly what the report wants.

Notes

- Data Gap
  - There is no question that the lack of up-to-date geospatial data for the RMI is a major problem. There are very few data available. Those do exist may not have the sufficient information including metadata or geographic accuracy to warrant a precise GIS modeling analysis as required by SWARS.
  - Significant efforts and resources should be committed to building a set of baseline spatial data for these very important RMI islands which obviously are facing many challenges that require the assistance of Geospatial technology and analyses.

Imagery available for various atolls

High-resolution (60 centimeter) QuickBird Imagery Purchased for 2008 FHP (Davis) PIC Mapping -- Landcover Maps

Ailinglaplap, Arno, Aur, Enewetok, Jaluit, Kwajalein, Likiep, Majuro, Maloelap, Mili, Rongelap, Wotje

Other Satellite Imagery (14 meter resolution/4 band) provided by Karness

Ailinginae, Ailinglaplap, Ailuk, Arno, Aur, Bikar, Biniki, Bokak, Ebon, Enewetak, Erikub, Jabat, Jaluit, Jemo, Kili, Kwajelein, Lae, Likiep, Majuro, Maloelap, Mejit, Mili, Namorik, Namu North, Namu South, Rongelap, Rongerik, Taka, Ujae, Ujelang, Utrik, Wake, Wotho, Wotje East, Wotje West.

Appendix B: Stakeholders' involvement in SWARS development

"State" Forest Stewardship Coordinating Committee (required) / Coastal Management Advisory Council

The "State" Forest Stewardship Committee became a Forest Service requirement for the Marshall Islands only with the 2008 Farm Bill (for the Forest Stewardship Program and the SWARS). An existing, active committee, already representing most of the required interests, the Coastal Management Advisory Council, has taken on the additional role of advising MRD concerning S&PF programs. The bylaws for its mission and membership have been revised accordingly. Additional members were added to represent WUTMI and local governments from Ebeye (Kwajelein) and two other atoll municipalities; a fourth municipal membership is in the process of being filled. The name of the committee will be changed to "Assessment and Resource Management Advisory Council".

The Coastal Management Advisory Council is established as a working group pursuant to the Memorandum of Understanding signed between several partner agencies, institutions and non-government organizations. The purpose of the group was to assist local government councils to formulate fishery management plans and fisheries management ordinances, and to harmonize efforts in facilitating the implementation of community fisheries management programs to all communities of the Marshall Islands. Over the years the group has expanded in membership to include Marshall Islands Visitors Authority, Office of Environmental Policy, Planning and Coordination and the Historic Preservation Office. Additionally, the Council has expanded its scope to focus on terrestrial resources in line with further integrating the RMI's community-based resource management planning efforts under the Reimaanlok. The purpose of the Council will be to continue to work with local communities, local governments, NGOs and others who are interested in developing policy for their coastal resources. It needs to be emphasized here that this group is an advisory body and is not for the purpose of creating policy or legislation.

Any community, government or NGO within the Marshall Islands can present to this group a request to help them develop policies and procedures for creating plans for sustainable development or conservation actions. This group will help through their combined expertise the goals of member partners. CMAC will not dictate or mandate any action but will recommend the best course of action.

Council members were convened in 2009 to list and discuss the primary set of SWARS issues, and again in March 2010 to develop strategies. Drafts of the SWARS have been circulated to all members and comments incorporated.

Table 7 Forest Stewardship Committee representation

Interest or agency required by law "if feasible" on the Forest Stewardship Committee	***Marshalls agency/group represented on expanded Coastal Management Advisory Council***
Forest Service *(not feasible)*	-
NRCS (not feasible)	-
Farm Service Agency *(not feasible)*	-
Cooperative Extension Service / National Institute of Food and Agriculture (Colleges/universities)	College of the Marshall Islands - Land Grant Program
Local Government	Municipal representatives from four atolls (one has recently joined from Ebeye, three more have been invited to date)
(Association of) S&WCD *(not feasible)*	-
Consulting foresters (Environmental consultants)	Hermit Crab Organization (Directors are consultants)
Forest products industry (Profit-making agro-forestry, handicrafts, copra processing, or ecotourism representatives)	Marshall Islands Handicraft Association is represented through Women United Together in the Marshall Islands
Private Forest landowners *(Agro-forest landowners)* Tribal representatives *(chiefs)* Land ownership rights in the Marshalls overlap, analogous to easements. All people have some land ownership/usage rights, but ultimate authority rests with one or more chiefs for each atoll. Chiefs do not need to be consulted for projects involving rights held by common people, but chiefs would need to be consulted directly with anything affecting ultimate authorities (as would be the case under Forest Legacy).	Committee members (local government officials) are tasked to consult with and represent their atolls' landowners (chiefs) and thus represent their interests on the committee. Direct consultation of landowners where necessary can be done through formal consultation of the Council of Chiefs, which is a very high-level, sensitive and political process.
Land-trust organizations *(not feasible)* State lead agency for Forest Legacy *(not applicable)*	-
Environmental/Conservation organizations	MICS
State fish & wildlife agency	MIMRA MRD
Others	EPA, OEPPC

"State" Wildlife Agency (required)

MRD, the forestry agency and submitter of the SWARS, is the point of contact for the Endangered Species Act (including terrestrial wildlife), in collaboration with EPA and MIMRA. The Marshall Islands Marine Resources Authority has overall responsibility for near shore marine fisheries, which are affected by forest (land) management. EPA and MIMRA were both consulted as part of the Coastal Management Advisory Council / Forest Stewardship Committee, as explained above.

State Technical Committee (required)

The Farm Bill expects consultation with the State Technical Committee, which would normally represent interests within the "state." The State Technical Committee in the Pacific is a regional body that only came to cover the Marshall Islands after the SWARS requirement became known; meetings are held by videoconference quarterly. The interests that would normally be represented by a State Technical Committee are largely the same as the interests represented in the Forest Stewardship Committee. There is no USDA NRCS office or Local Working Group in the Marshalls. Therefore, this requirement was addressed by establishing the Forest Stewardship Committee, and by emailing the draft SWARS to Bart Lawrence, Assistant Director for Operations, Pacific Islands-West, USDA NRCS, in May 2010, with a request for review by the (regional) State Technical Committee, even if late.

Lead agency for the Forest Legacy Program (required)

Not applicable, as the Marshall Islands are not yet participating in the Forest Legacy program.

Applicable Federal land management agencies (required)

The only Federal (US) land management agency is the US Department of Defense, which occupies and manages most of Kwajelein atoll, under the terms of the Compact of Free Association between the U.S. and the Republic of the Marshall Islands. This military relationship is highly sensitive; especially as consultations concerning land also involves chiefs (see explanation of "tribal representatives" under Forest Stewardship Committee).

Under the terms of the Compact of Free Association, as Amended, there are established forums where specific issues of concern can be addressed. The first is the Community Relations Council (CRC) which comprises the RMI government, the Kwajalein Leadership and the US Department of Defense. The other forum is the twice-yearly Joint Committee Meeting (JCM) between the RMI and US governments. The SWARS will be reviewed through these established channels with the US military.

State Urban Forestry Council

The Marshalls Urban Forestry Council was established in 2006 and includes two tree-planting advisory boards for the most urbanized islands, Majuro and Ebeye. Members of the Council, including the members of the Majuro and Ebeye U&CF Tree-planting Advisory Boards, were consulted concerning SWARS.

Appendix C: Glossary of acronyms

CE	Conservation Education
CFAA	Cooperative Forestry Assistance Act
CMAC	Coastal Management Advisory Council
CMI	College of the Marshall Islands
CWPP	Community Wildfire Protection Plans
EPA	Environmental Protection Authority (also RMIEPA)
F&AM	Fire & Aviation Management
FAO	United Nations Food & Agriculture Organization
FS	USDA Forest Service
FSP	Forest Stewardship Program
GEF	United Nations General Environmental Fund
GIS	Geographic Information System
IUCN	International Union for the Conservation of Nature
JNJIE	Jorikrik Nan Jorikrik Ilo Ejmour (Youth to Youth in Health)
KALGOV	Kwajelein Atoll Local Government
NIPF	Non-Industrial Private Forest Land (all forest land in the Marshall Islands)
NRCS	USDA Natural Resources Conservation Service
MALGOV	Majuro Atoll Local Government
MC	Micronesia Challenge
MICS	Marshall Islands Conservation Society
MIIST	Marshall Islands Invasive Species Taskforce
MIMRA	Marshall Islands Marine Resources Authority
MIVA	Marshall Islands Visitors Authority
MOE	Ministry of Education
MRD	Ministry of Resources and Development
NTC	National Training Council
OEPPC	Office of Environmental Planning and Policy Coordination
PII	Pacific Invasive Initiative
RISC	Regional Invasive Species Council (Micronesia)
RMIEPA	Republic of the Marshall Islands Environmental Protection Authority
RNGR	FSP Reforestation, Nurseries & Genetic Resources
S&PF	State & Private Forestry
SFSCC	State Forest Stewardship Program Coordinating Committee
SLM	Sustainable Land Management
SOPAC	Pacific Islands Applied Geoscience Commission (to be absorbed into SPREP and SPC)
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environmental Programme
STC	State Technical Committee = TAC (NRCS)
SWARS	State-Wide Assessment and Resource Strategy
TAC	Technical Advisory Committee = STC (NRCS)
TTM	Taiwan Technical Mission
U&CF	Urban & Community Forestry
USDA	United States Department of Agriculture
USFS	United States (Department of Agriculture) Forest Service
USP	University of the South Pacific
WUTMI	Women United Together Marshall Islands

Appendix D: S&PF performance measures

Objective	Proposed Core Performance Measure (attributable to S&PF Investments)
1.1 Identify and conserve high priority forest ecosystems and landscapes.	**CURRENT MEASURE –**High priority forest ecosystems and landscapes are protected from conversion (acres - annual and cumulative).
1.2 Actively and sustainably manage forests.	**CURRENT MEASURE** • Number of acres in forest areas being managed sustainably as defined by current Forest Stewardship Management Plan (cumulative[25]) – through a nationally consistent monitoring program.
2.1 Restore fire-adapted lands and/or reduce risk of wildfire impacts.	**CURRENT MEASURES** • Number of acres treated to restore fire-adapted ecosystems that are (1) moved toward desired conditions and (2) maintained in desired conditions (annual). • Total # of acres treated to reduce hazardous fuels on state and private lands through State Fire Assistance (annual, direct federal grant only). • Percentage of at risk communities who report increased local suppression capacity as evidenced by: (1) The increasing number of trained and/or certified fire fighters and crews or (2) Upgraded or new fire suppression equipment obtained or (3) Formation of a new fire department or expansion of an existing department involved in wildland fire fighting.
2.2 Identify, manage and reduce threats to forest and ecosystem health.	**CURRENT MEASURE** • Number and percent of forest acres restored and/or protected from (1) invasive and (2) native insects, diseases and plants (annual).
3.1 Protect and enhance water quality and quantity.	**NEW MEASURE** • *Acres and percent of priority watershed areas where S&PF activities are enhancing or protecting water quality and quantity.*
3.2 Improve air quality and conserve energy.	**NEW MEASURES** • *Population of communities benefiting from S&PF activities designed to contribute to an improvement in air quality.* • *Population of communities benefiting from S&PF activities that result in energy conservation.*
3.3 Assist communities in planning for and reducing forest health & wildfire risks.	**CURRENT MEASURES** • Number and percent of communities-at-risk covered by a CWPP or equivalent that are reducing their risk of wildland fire (annual). • Percent of population living in communities developing or managing programs to plant, protect and maintain their urban and community trees and forests.
3.4 Maintain and enhance the economic benefits and values of trees and forests.	**CURRENT MEASURE** • Number of communities and percent of population served under an active urban forest management plan. **NEW MEASURE** • Number of total jobs (direct, indirect, and induced) sustained or maintained in the economy annually due to S&PF investments. • Total value of resources leveraged through partnerships with states and others partners.[26]

[25] In this instance, "cumulative" refers to the sum total of current, active plans that have been field-verified.

[26] This measure will account for both monetary and in-kind contributions from partners. This type of information will be collected annually due to a new requirement in the 2008 Farm Bill that requires States to submit an annual report detailing how funds made available under the Farm Bill are used. This measure will utilize that information.

3.5 Protect, conserve, and enhance wildlife and fish habitat.	**NEW MEASURES** • *Acres and percent of priority habitat areas where S&PF activities are protecting, conserving, and enhancing wildlife and fish habitat.* • *Acres of connected forest resulting from S&PF investments.*
3.6 Connect people to trees and forests, and engage them in environmental stewardship activities.	**CURRENT MEASURES** • Number of people who annually participate in FS and state forestry agency environmental literacy programs and activities. **NEW MEASURE** • Number of people (measured in person days) engaged in environmental stewardship activities as part of an S&PF program.[27]
3.7 Manage trees and forests to mitigate and adapt to global climate change	**NEW MEASURES** • *Acres and percent of priority areas vulnerable to climate change where S&PF activities are contributing to resilient forests able to adapt to climate change.*[28] • *Potential carbon sequestered through implementation of forest management practices that result from S&PF investments on **private** forest lands.*

Appendix E: Plans consulted and/or attached

[27] This will include information on landowners in the Forest Stewardship Program who have attended education programs, as well as people attending trainings, workshops, or volunteering as captured by other programs, like Urban and Community Forestry, Forest Health, and others. .

[28] Many of the activities occurring in Themes 1 and 2, as well as some occurring in Theme 3, are occurring in those "vulnerable areas" and would help forests adapt to climate change. Not all activities in S&PF will be counted towards this measure.

Community Wildfire Protection Plans (required)

No community wildfire protection plans or state-wide fire plan have been written in the Marshall Islands. (The Marshalls became eligible for FS Fire & Aviation Management funding with the 2008 Farm Bill.) The development of such plans is shown as a strategy.

"State" Wildlife Action Plan (required)

Several documents address native terrestrial wildlife as part of broader biodiversity plans. The National Biodiversity Report of the Republic of the Marshall Islands ("The Marshall Islands – Living Atolls Amidst the Living Sea"[29]) is enclosed as an integral part of this Assessment. The 2000 "Republic of the Marshall Islands Biodiversity Strategy and Action Plan"[30] was written but does not address specific terrestrial locations or species. Reimaanlok[31] was published in 2008 to move the Action Plan to address specific community consultation processes, specific conservation areas, and species and ecosystems; as the most recent, active and management-oriented biodiversity plan, it was chosen to be an integral part of the SWARS.

Other

Republic of the Marshall Islands, Ministry of Resources and Development, 2004. "Strategy and Action Plan 2005-2010." 63 pages. This is still the guiding document for R&D (an updated Strategy and Action Plan will be completed later in the year) and is attached to this SWARS. It cross-references goals, objectives and strategies from the Marshalls' "Vision 2018" (15-year strategic development plan) that are most relevant to MRD.

Urban & Community Forestry strategic plans for Majuro and Ebeye, 2006-2011. These currently active plans for the most urbanized islands are retained as working documents and are incorporated into the SWARS, cross-referenced in the Strategies matrix and attached in this Appendix.

[29] National Biodiversity Team of the Republic of the Marshall Islands, 2000. *(as already cited)*
[30] The Republic of the Marshall Islands National Biodiversity Strategy and Action Plan Team. 2000. "The Republic of the Marshall Islands Biodiversity Strategy and Action Plan." A Global Environmental Facility / United Nations Development Programme Project.
[31] Reimaanlok National Planning Team *(as already cited)*

Appendix E-1

Republic of the Marshall Islands, Ministry of Resources and Development
Division of Agriculture
P. O. Box 1727
Majuro, Marshall Islands 96960
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The Five-Year Plan
Urban and Community Forestry Program
Majuro Atoll, 2006 - 2011

Currently Funded By:

Region 5, State and Private Forestry Programs

USDA Forest Service

Prepared for:

Majuro Atoll Urban and Community Forestry Tree Planting Advisory Board

and

The USDA Forest Service, Region 5 State and Private Forestry

Prepared by:

The Division of Agriculture, Ministry of Resources and Development

Karness K. Kusto, *Program Manager*

January 2006

The Urban and Community Forestry Five-Year Plan Majuro Atoll

2006 - 2011

FORWARD

This Five-year plan is intended to serve as a guide to coordinate emerging issues and the needs of Majuro Atoll. It is intended to serve as a guide to increase the mutual understanding and appreciating the benefits of urban forests. In Majuro, "Urban Forestry" applies to all areas including villages, and coastal areas where urbanization largely occurs. These benefits include clean water, clean air, energy conservation, and some economic returns. This effort will be successful only if we encourage sustainability of our limited natural resources in the urban communities.

Urban and Community forestry will address the need to create and maintain healthy ecosystems where people live, work, and recreate. The success of the Urban and Community Forestry Program strictly depends on community involvement and awareness rising of forestry conservation. A volunteer concept is incorporated with particular emphasis on the empowerment of the community so that the people see themselves as potential leaders and resource owners (stakeholders).

When communities have access to information and opportunities for improving management skills, they can make appropriate decisions for sustainable land-use by themselves. The Urban and Community Forestry Program will continue to encourage partnership among USDA Forest Service, the Republic of the Marshall Islands Government, Majuro Atoll Local Government, traditional and local leaders, Women groups, Youth groups, churches, inter-agencies and concerned citizens.

I. *INTRODUCTION*

A. ***Island Overview:***

Majuro Atoll is the most urbanized island in the Republic of the Marshall Islands. It is about 30 miles from the northern end of Rita Village to the western end of Laura. It is consists of one main flat coral island and 21 small islets spread on the flat reef of the atoll. The current population is approximately 31,200 people (1998). The total land area is about 6 square miles. Roughly 55% of the population of the entire nation lives in Majuro. The climate is maritime tropical, and the natural vegetation of the island is humid sub-tropical.

B. Land Ownership

Majuro Atoll strongly maintains and practices its traditional leadership system called the "iroij" for man, the "leroij" for woman, "alap" land owner and "ri-jerbal" the worker. An iroj traditionally has the authority for distribution of land, water and forests claimed under his or her title. An iroj decides which piece of the land each household will use. The use of an assigned area of land with permission for farming and dwelling marks the establishment of a more or less permanent right to land ownership.

Under traditional law, custom and decree protect the undeveloped forestlands of the village. The cutting or other management of forestlands is only allowed by special permission of the iroj or alab and ri-jerbal of such land portion.

C. The Current Situation

Majuro Atoll is facing the same problem as many of the other small islands in the Pacific:

- ► A fixed and very limited arable land base.
- ► A high percentage of the land base in fragile ecosystems
- ► A rapidly expanding population.
- ►Isolation from the mainstream of ecosystem management concepts
- ►Susceptibility to sea level changes (i.e. global climate changes)

Soils are most susceptible to erosion along coastal areas, especially during storms and storm surges without proper coastal protection. The projected population growth is 3.7 %, which translates to 35,000 additional people will live in by the year 2010. The rapid population expansion is creating more subsistence farmers, and accompanying urbanization is forcing those new subsistence farmers onto fragile sites such as coastal areas and forests which lead to deforestation. This land use activity can only exacerbate the existing environmental problems of non-point source pollution and degrade both terrestrial and marine ecosystems.

II. *VISION: The vision of Urban and Community Forestry Program* is to develop a sustainable and healthy community forests throughout the Marshall Islands.

A. Mission Statement:

The mission of Urban and Community Forestry Program is to support local communities with the planning and implementation of community beautification, coastal stabilization, traditional forestry practices, and the sustainable use of natural resources. The Urban and Community Forestry Program provides the leadership in forestry education and management of forests and tree resources with respect to the culture and environment of Majuro Atoll and the entire Republic of the Marshall Islands.

B. PROGRAM GOALS

1. To improve the community environment by planting ornamental and/or culturally important tree species in towns, schools, other public areas, and villages in order to maintain and enhance aesthetic and recreational value of trees in our community.

2. To increase public awareness and appreciation of forests and traditional knowledge of plant uses.

4. To improve and maintain the physical environment of with special attention to the health of wetland systems, conservation of biodiversity, and protection of coastal erosion.

5. To promote effective communication and cooperation among agencies and interested parties working with natural resources.

V. OBJECTIVES and ACTIVITIES

***Objective 1*:** Promote the planting of aesthetically pleasing trees in villages, parks and schools.

Activities;

A. Collect seeds of and propagate selected species
B. Distribute seedlings to communities, schools and other groups that demonstrate a desire to improve their local environment
C. Incorporate ideas and innovations from other islands in the Pacific Region to improve the quality of community forests. With special care not to import invasive species

***Objective 2*:** Promote the planting of heritage tree species.

Activities;

A. Collect the seeds of and propagate well-known heritage species.
B. Distribute seedlings for planting in communities, parks and public areas.
C. Conduct investigation to determine the location of and availability of lesser-known heritage species.

***Objective 3*:** Involve communities with the planning and execution of U&CF projects.

Activities:

A. Encourage land owners and other participants such as volunteers, and resource custodians to do the planting and maintain the project area.
B. Forestry staff will organize and attend meetings with communities in the evenings and weekends, if normal working-day arrangements are not possible.
C. Appropriate authorities will be consulted before tree planting projects proceed to avoid possible conflicts with land owners, public services and other construction development.

***Objective 4*:** Ensure that trees planted are well maintained and receive proper security.

Activities:

A. U&CF staff will monitor projects frequently and remind clients or participants about maintaining their responsibilities.
B. U&CF will continue to provide technical assistance to the responsible organizations, villages, and individuals.
C. Recognize those communities that properly take care of urban forests.

***Objective 5*:** Promote the awareness and appreciation of Marshallese trees and forests to the youth of the Marshall Islands.

Activities;

A. Provide educational materials and services to schools and villages.
B. Conduct presentations to students, teachers, and religious youth groups.
C. Assist students with annual science fair projects and other school investigations.
D. Provide training to students and campus custodians for the proper tree care and maintenance.
E. Invite school and other youth groups to visit demonstration areas at the Nursery Station.
D. Promote the celebration of Earth Day in as many schools as possible.

***Objective 6*:** Promote the awareness and appreciation of Majuro forests and trees to the communities of Majuro Atoll

Activities;

A. Produce brochures and information centers about important species and their cultural values.
B. Prepare radio talks, television programs, and newspaper articles.
C. Conduct presentations to communities and government leaders.
D. Recognition of communities, individuals and partners who demonstrate excellent U&CF practices.
E. Develop demonstration projects that promote heritage trees.
F. Provide training to communities and public agencies for proper tree care and maintenance.
G. Promote the celebration of Earth day in communities when appropriate.

***Objective 7*:** Promote the awareness and appreciation of traditional uses of Majuro forests and plants.

Activities;

A. Maintain a demonstration garden of traditional Marshallese plants and provide interpretive information for visitors.
B. Publish brochures on Majuro forests and the traditional uses of important plants.
C. Hold workshops on Majuro forests and traditional uses of plants.
D. Conduct surveys on the contemporary use of plants in Marshallese

communities.

***Objective 8*:** To protect coastlines from erosion and storm surges

Activities:

A. Collect seeds and propagate appropriate coastal and riparian plants.

B. Work with coastal and streamside villages and schools to plant trees in areas that stabilization is required.

C. Monitor planting sites to ensure tree survival and effectiveness of stabilization.

***Objective 10*:** Facilitate the ability of agencies and communities to effectively educate the public and protect natural resources of the Marshall Islands.

Activities;

A. Hold quarterly U&CF council meetings to discuss past and future developments of the forestry sector in the Ministry of Resources and Development. Update 5-year plan as necessary.

B. Work with the local college and other organizations to promote environmental concepts and education.

D. Develop MOU's between CMI Land Grant and other agencies to clarify Forestry's role in providing technical advice, education, and planting materials.

E. Encourage the RMI Government and other entities to compensate the U&CF program for the support of seedling production and technical assistance so that USFS matching requirements can be met.

F. Encourage forestry training programs for professionals and interested people.

G. Participate in environmental workshops, seminars, and educators' conferences.

***Delivery System**: The UCF makes initial contacts with the village councils before the start of a new project, through the Office of Internal and Local Government Affairs. With other organizations UCF makes arrangements through their leaders particularly churches and youth groups, public and private schools, government-inter-agency partnerships, Women Organizations, and the media-TVs, radios, newspapers, trainings, workshops, meetings, field-days, and celebrations. The UCF Program also assists individual projects by giving presentations for the lands where projects are established.*

A. RMI Ministry of Resources and Development - Dept. of Agriculture – Marshall Islands Conservation Society (MICS)

The local Conservation Society of the Marshall Islands (MICS) has agreed to serve as one of the members of the Urban and Community Forestry Tree Planting Advisory Board have very similar goals and objectives, which facilitates cooperation and

collaboration of some projects. MICS also collaborate with the Forestry Section to provide technical assistance for coastal projects in RMI.

B. ***WUTMI***

The women association of the Marshall Islands (WUTMI) Women United Together in the Marshall Islands has been playing a vital role in the Tree Planting Advisory Board. WUTMI has its own goals and objectives which are very similar in many ways to conservation of traditional trees and medicinal plants. WUTMI is providing technical assistance in school beautification projects.

C. MIVA

D. MALGOV

Appendix E-2.

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The Five-Year Plan
Urban and Community Forestry Program
Ebeye, Kwajalein Atoll, 2006 - 2011

Currently Funded By:

Region 5, State and Private Forestry Programs

USDA Forest Service

Prepared for:

Ebeye Urban and Community Forestry Tree Planting Advisory Board

and

The USDA Forest Service, Region 5 State and Private Forestry

Prepared by:

The Division of Agriculture, Ministry of Resources and Development

Karness K. Kusto, *Program Manager*

January 2006

The Urban and Community Forestry Five-Year Plan Ebeye Kwajalein Atoll

2006 - 2011

FORWARD

This Five-year plan is intended to serve as a guide to coordinate emerging issues and the needs of Ebeye Island. It is intended to serve as a guide to increase the mutual understanding and appreciating the benefits of urban forests. In Ebeye, "Urban Forestry" applies to all areas including villages, and coastal areas where urbanization largely occurs. These benefits include clean water, clean air, energy conservation, and some economic returns. This effort will be successful only if we encourage sustainability of our limited natural resources in the urban communities.

Urban and Community forestry will address the need to create and maintain healthy ecosystems where people live, work, and recreate. The success of the Urban and Community Forestry Program strictly depends on community involvement and awareness rising of forestry conservation. A volunteer concept is incorporated with particular emphasis on the empowerment of the community so that the people see themselves as potential leaders and resource owners (stakeholders).

When communities have access to information and opportunities for improving management skills, they can make appropriate decisions for sustainable land-use by themselves. The Urban and Community Forestry Program will continue to encourage partnership among USDA Forest Service, the Republic of the Marshall Islands Government, Kwajalein Atoll Local Government, traditional and local leaders, Women groups, Youth groups, churches, inter-agencies and concerned citizens.

I. INTRODUCTION

C. Island Overview:

Ebeye Island is the most urbanized island in the Republic of the Marshall Islands. It is less than 3 miles from one end to the other. It is one of the small islets spread on the flat reef of Kwajalein Atoll. The current population is approximately 10,000 people (1998). The total land area is about less than square miles. Roughly 20% of the population of the entire nation lives in Ebeye. The climate is maritime tropical, and the natural vegetation of the island is humid sub-tropical.

B. Land Ownership

Ebeye strongly maintains and practices its traditional leadership system called the "iroij" for man and the "leroij" for woman. An iroj traditionally has the authority for distribution of land, water and forests claimed under his or her title. An iroj decides which piece of the land each household will use. The use of an assigned area of land with permission for farming and dwelling marks the establishment of a more or less permanent right to land ownership.

Under traditional law, custom and decree protect the undeveloped forestlands of the village. The cutting or other management of forestlands is only allowed by special permission of the iroj or alab and senior ri-jerbal of such land portion.

D. The Current Situation

Ebeye is facing the same problem as many of the other small islands in the Pacific:

- ► A fixed and very limited arable land base.
- ► A high percentage of the land base in fragile ecosystems
- ► A rapidly expanding population.
- ►Isolation from the mainstream of ecosystem management concepts
- ►Susceptibility to sea level changes (i.e. global climate changes)

Soils are most susceptible to erosion along coastal areas, especially during storms and storm surges without proper coastal protection. The projected population growth is 3.7 %, which translates to 35,000 additional people will live in by the year 2010. The rapid population expansion is creating more subsistence farmers, and accompanying urbanization is forcing those new subsistence farmers onto fragile sites such as coastal areas and forests which lead to deforestation. This land use activity can only exacerbate the existing environmental problems of non-point source pollution and degrade both terrestrial and marine ecosystems.

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A. Mission Statement:

The mission of Urban and Community Forestry Program is to support local communities with the planning and implementation of community beautification, coastal stabilization, traditional forestry practices, and the sustainable use of natural resources. The Urban and Community Forestry Program provides the leadership in forestry education and management of forests and tree resources with respect to the culture and environment of Ebeye, Kwajalein Atoll and the entire Republic of the Marshall Islands.

B. PROGRAM GOALS

1. To improve the community environment by planting ornamental and/or culturally important tree species in towns, schools, other public areas, and villages in order to

maintain and enhance aesthetic and recreational value of trees in our community.

2. To increase public awareness and appreciation of forests and traditional knowledge of plant uses.

4. To improve and maintain the physical environment of with special attention to the health of wetland systems, conservation of biodiversity, and protection of coastal erosion.

5. To promote effective communication and cooperation among agencies and interested parties working with natural resources.

V. OBJECTIVES and ACTIVITIES

Objective 1: Promote the planting of aesthetically pleasing trees in villages, parks and schools.

Activities;

A. Collect seeds of and propagates selected species
B. Distribute seedlings to communities, schools and other groups that demonstrate a desire to improve their local environment
C. Incorporate ideas and innovations from other islands in the Pacific Region to improve the quality of community forests. With special care not to import invasive species

Objective 2: Promote the planting of heritage tree species.

Activities;

A. Collect the seeds of and propagate well-known heritage species.
B. Distribute seedlings for planting in communities, parks and public areas.
C. Conduct investigation to determine the location of and availability of lesser-known heritage species.

Objective 3: Involve communities with the planning and execution of U&CF projects.

Activities:

A. Encourage land owners and other participants such as volunteers, and resource custodians to do the planting and maintain the project area.
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Activities;

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B. Conduct presentations to students, teachers, and religious youth groups.

C. Assist students with annual science fair projects and other school investigations.

D. Provide training to students and campus custodians for the proper tree care and maintenance.

E. Invite school and other youth groups to visit demonstration areas at the Nursery Station.

D. Promote the celebration of Earth Day in as many schools as possible.

Objective 6: Promote the awareness and appreciation of forests and trees to the communities of Ebeye,Kwajalein Atoll

Activities;

A. Produce brochures and information centers about important species and their cultural values.

B. Prepare radio talks, television programs, and newspaper articles.

C. Conduct presentations to communities and government leaders.

D. Recognition of communities, individuals and partners who demonstrate excellent U&CF practices.

E. Develop demonstration projects that promote heritage trees.

F. Provide training to communities and public agencies for proper tree care and maintenance.

G. Promote the celebration of Earth day in communities when appropriate.

Objective 7: Promote the awareness and appreciation of traditional uses of Ebeye forests and plants.

Activities;

A. Maintain a demonstration garden of traditional Marshallese plants and provide interpretive information for visitors.

B. Publish brochures on Ebeye forests and the traditional uses of important plants.

C. Hold workshops on Ebeye forests and traditional uses of plants.

D. Conduct surveys on the contemporary use of plants in Marshallese communities.

Objective 8: To protect coastlines from erosion and storm surges

Activities:

A. Collect seeds and propagate appropriate coastal and riparian plants.
B. Work with coastal and streamside villages and schools to plant trees in areas that stabilization is required.
C. Monitor planting sites to ensure tree survival and effectiveness of stabilization.

Objective 10: Facilitate the ability of agencies and communities to effectively educate the public and protect natural resources of the Marshall Islands.

Activities;

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A. U.S Dept. of Agriculture - Natural Resources Conservation Service (NRCS)

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LAND & CONSERVATION

AILINGINAE, BIKINI, RONGELAP, AND RONGERIK

REPUBLIC OF THE MARSHALL ISLANDS

*Landcover data not available.

Priority Area

- Conservation Areas
- Coastal Buffer Zone

Conservation Targets

- Crab population
- Breadfruit forest
- Climax forest
- Mangrove area
- Pemphis acidula forest
- Pond
- Shrubland/Grassland
- Windward forest
- Bwebwenato

Landcover

- Forest
- Rangeland
- Urban
- Barren
- Water

Landform

- Land
- Lagoon
- Others
- Airports

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USDA Forest Service
Pacific Southwest Region
Forest Health Protection
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LAND & CONSERVATION

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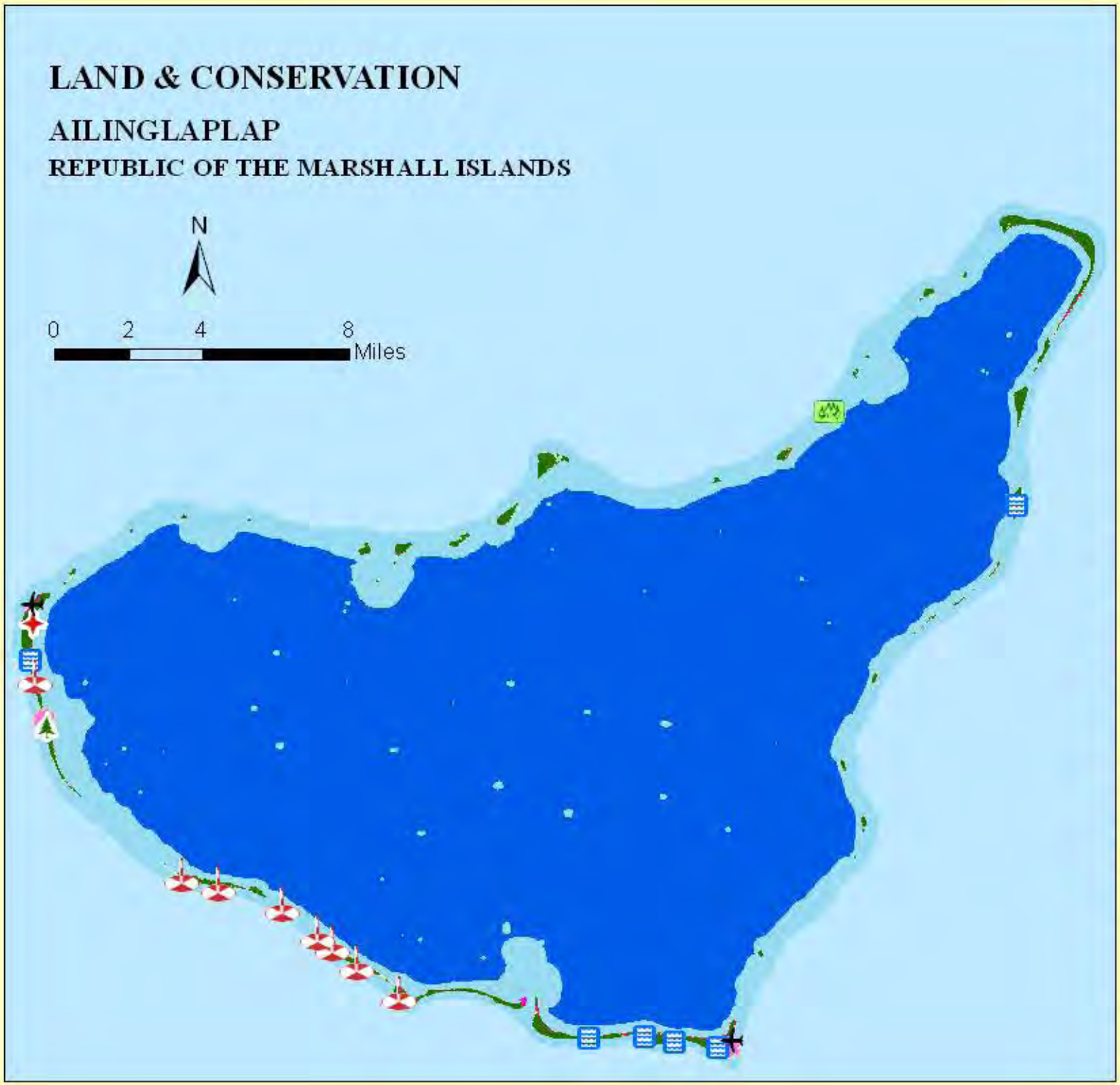
REPUBLIC OF THE MARSHALL ISLANDS



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- Coastal Buffer Zone

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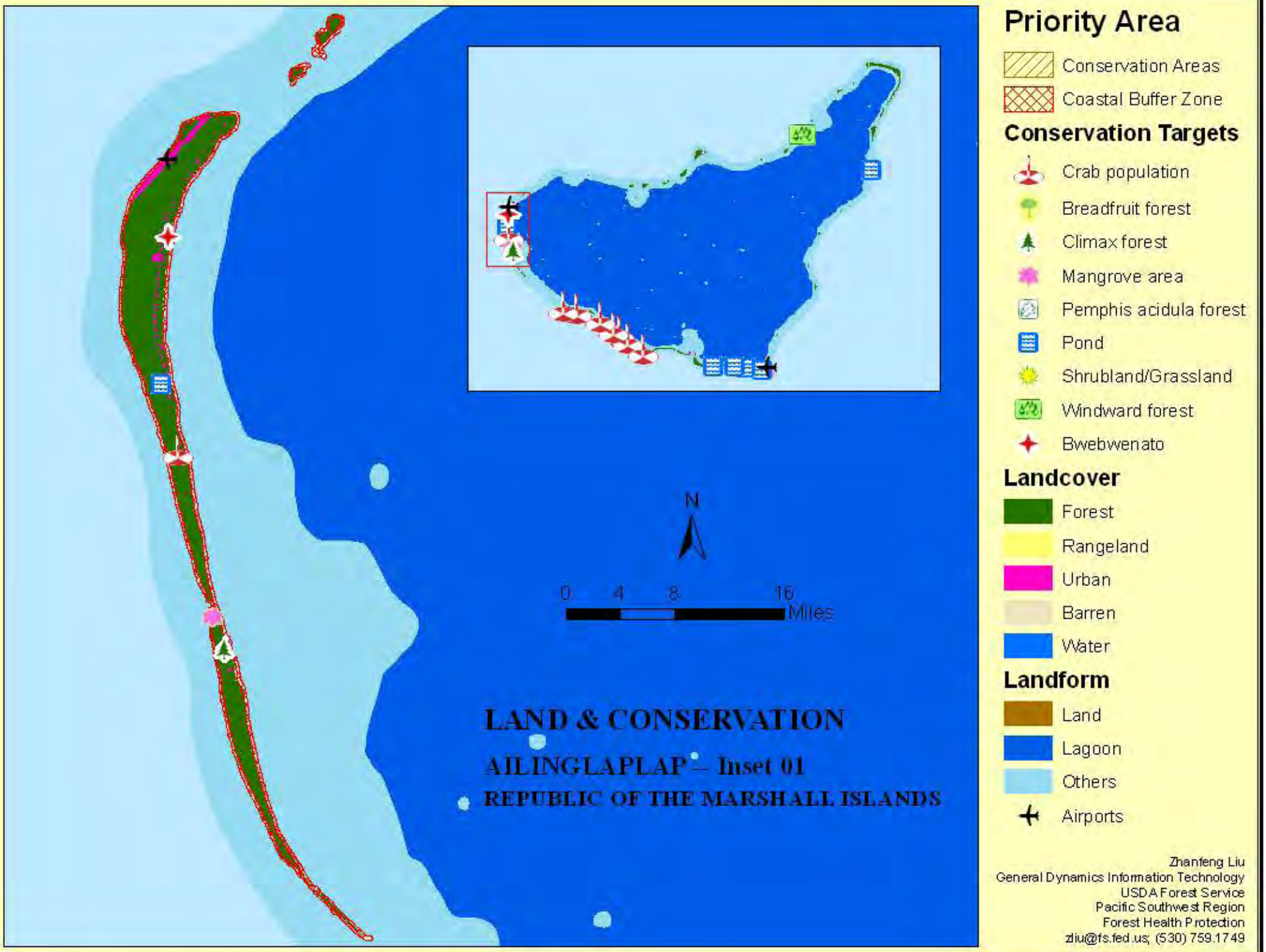

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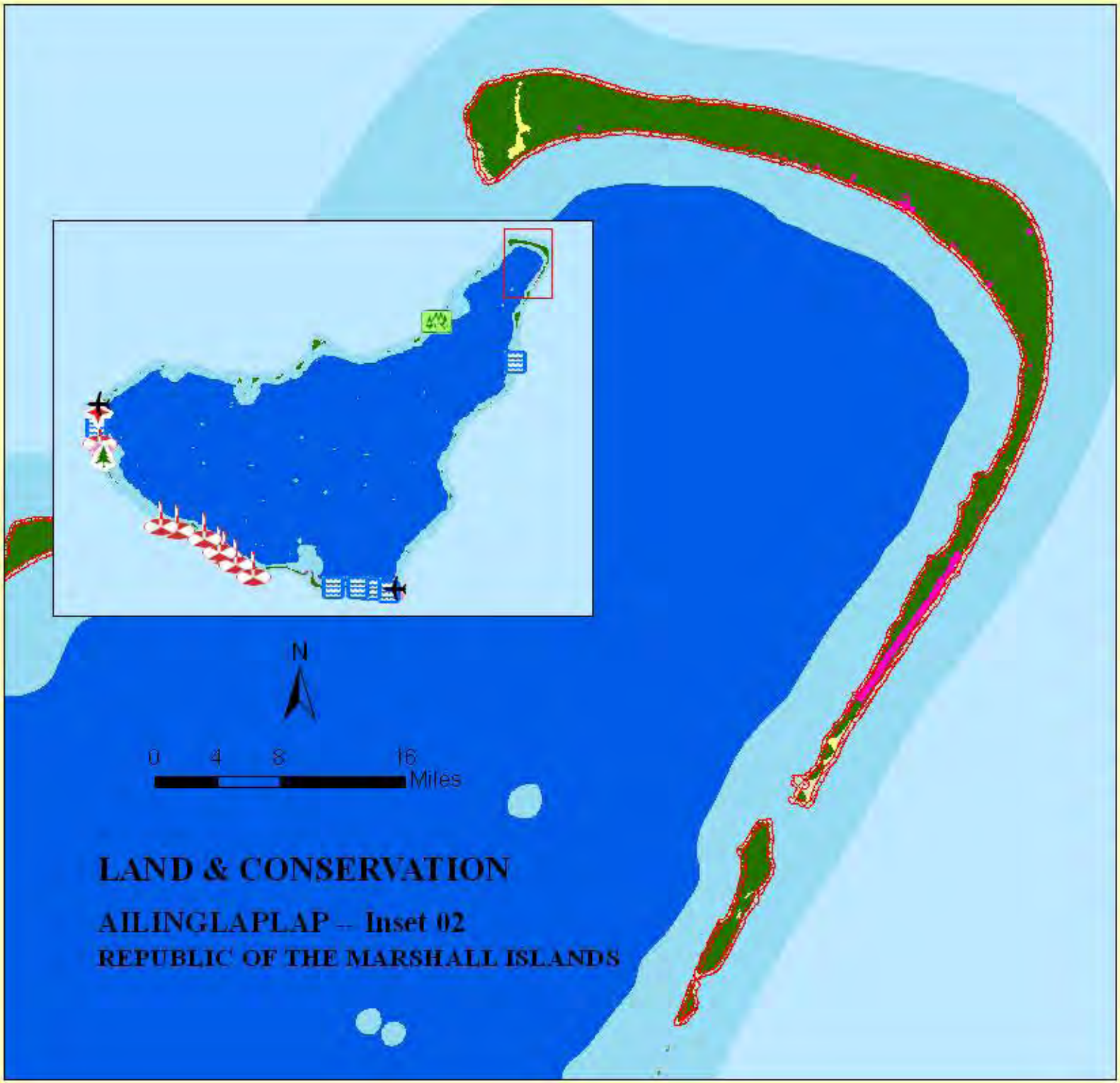

LAND & CONSERVATION

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REPUBLIC OF THE MARSHALL ISLANDS

Priority Area

- Conservation Areas
- Coastal Buffer Zone

Conservation Targets

- Crab population
- Breadfruit forest
- Climax forest
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- Pemphis acidula forest
- Pond
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Landcover

- Forest
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LAND & CONSERVATION

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REPUBLIC OF THE MARSHALL ISLANDS

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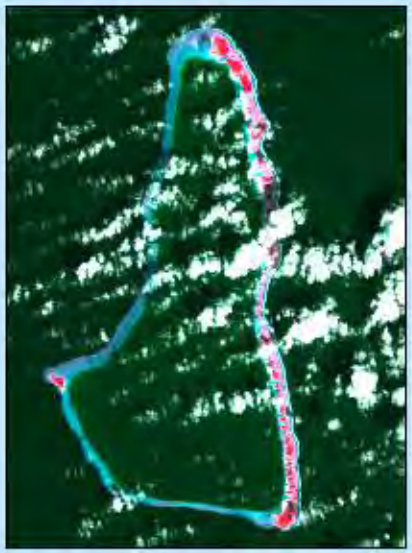

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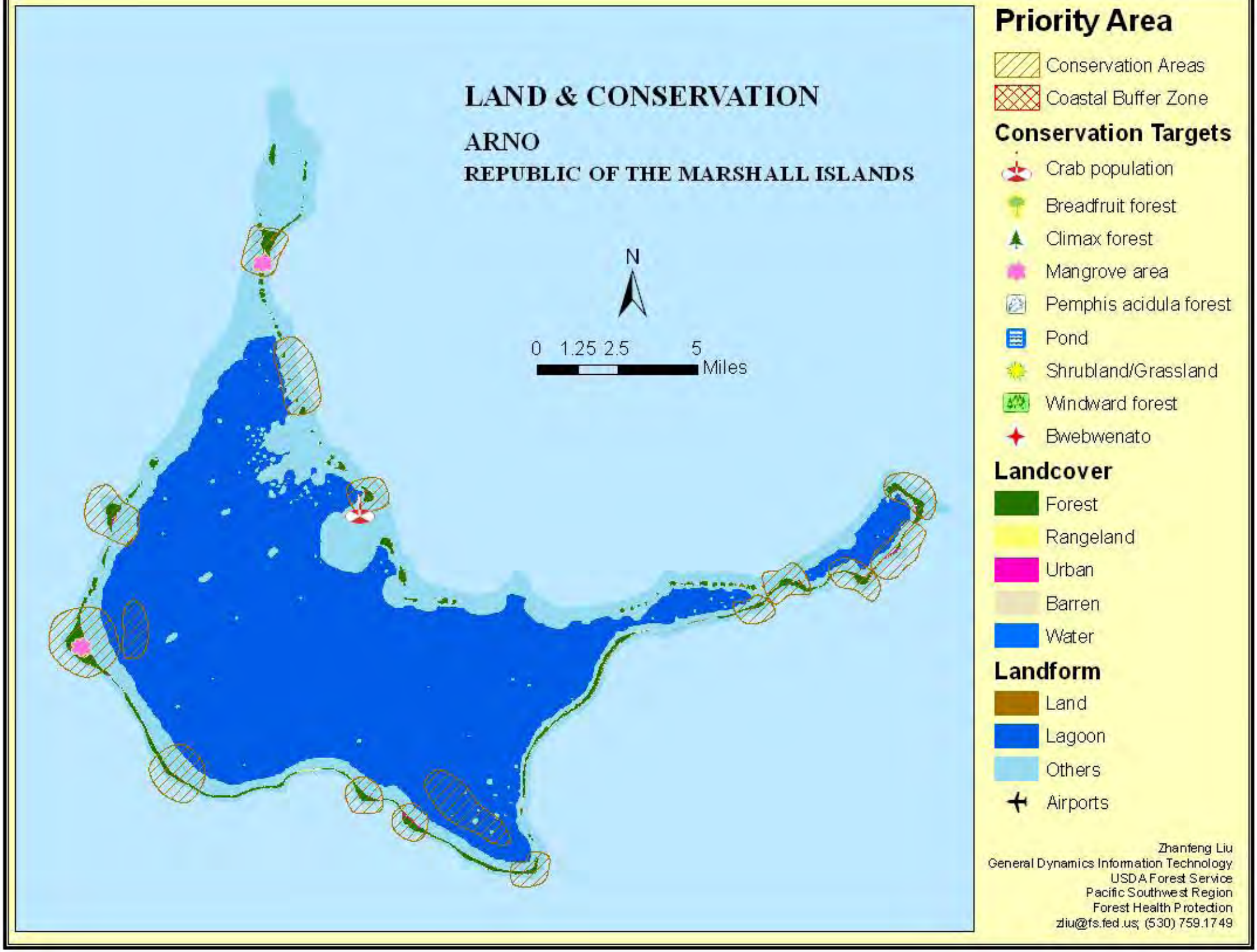

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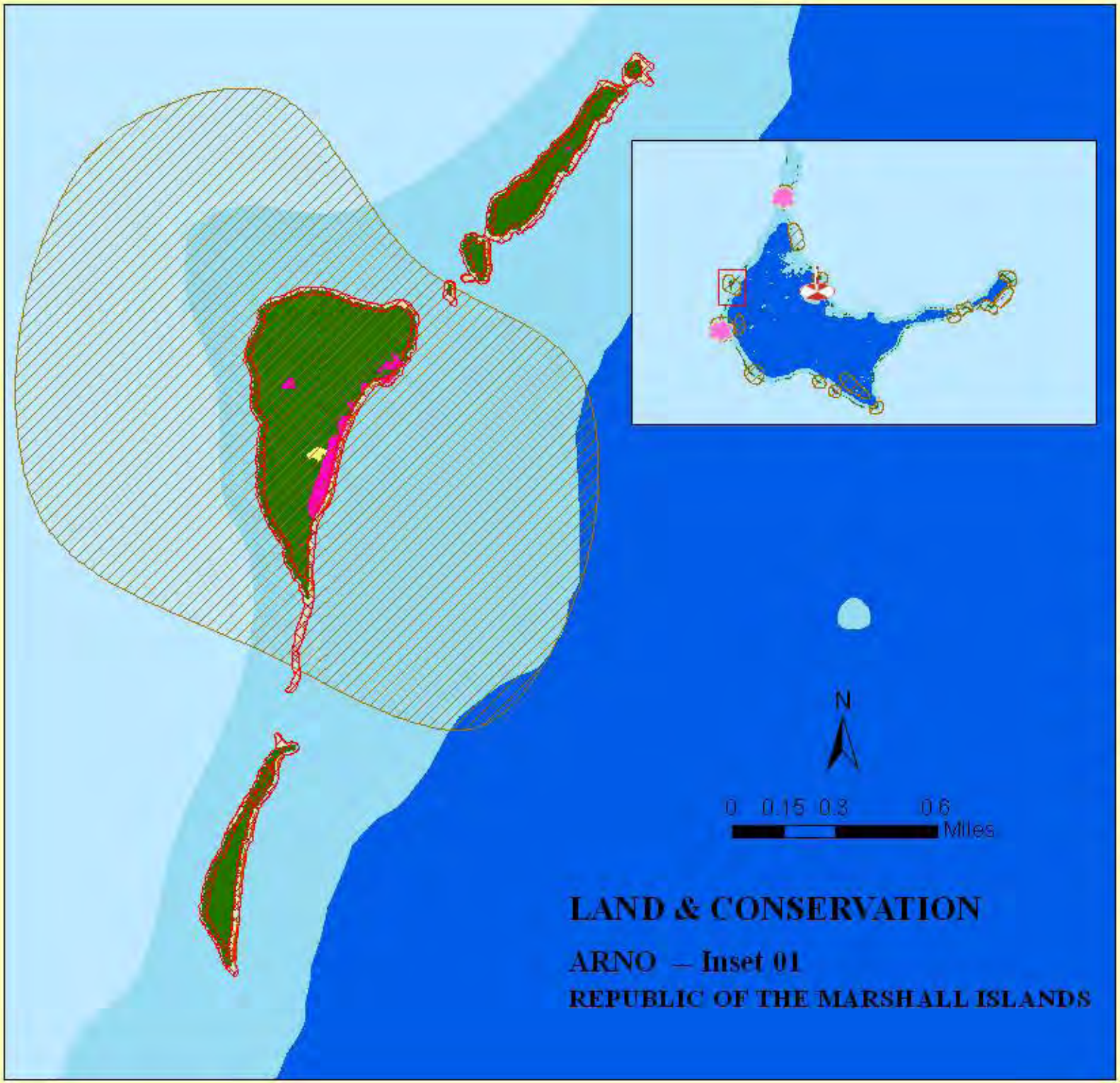

Priority Area

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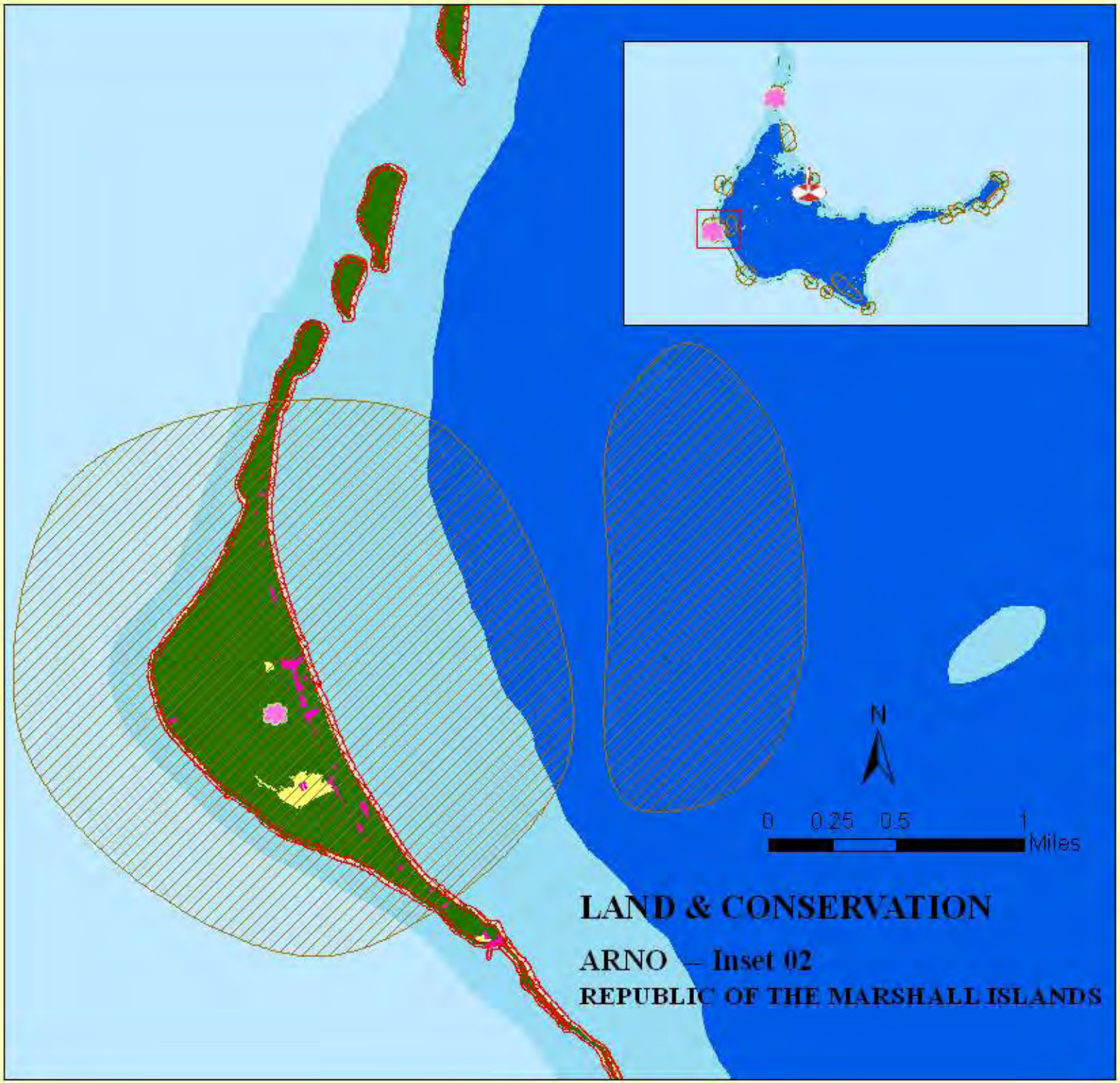

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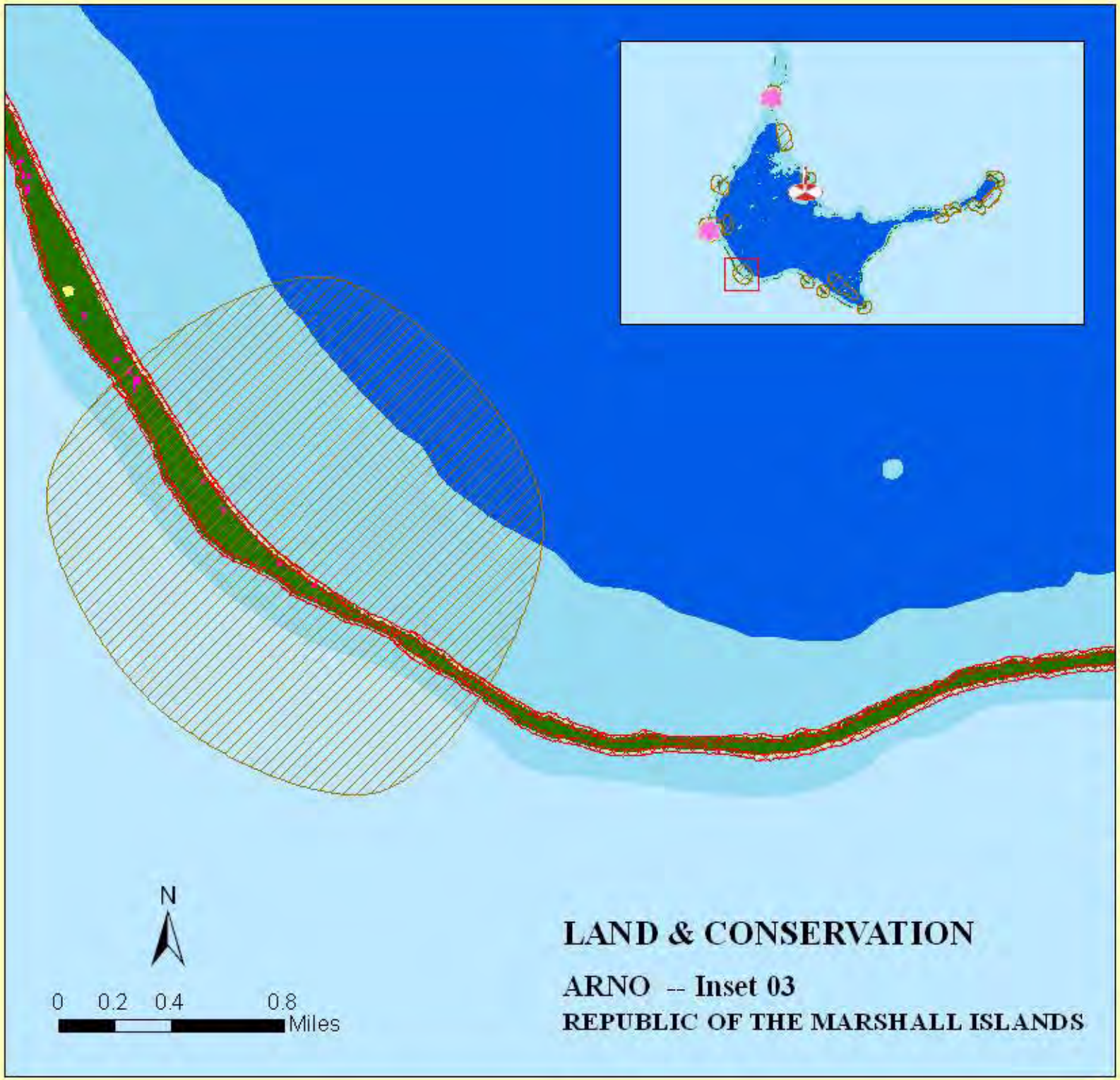

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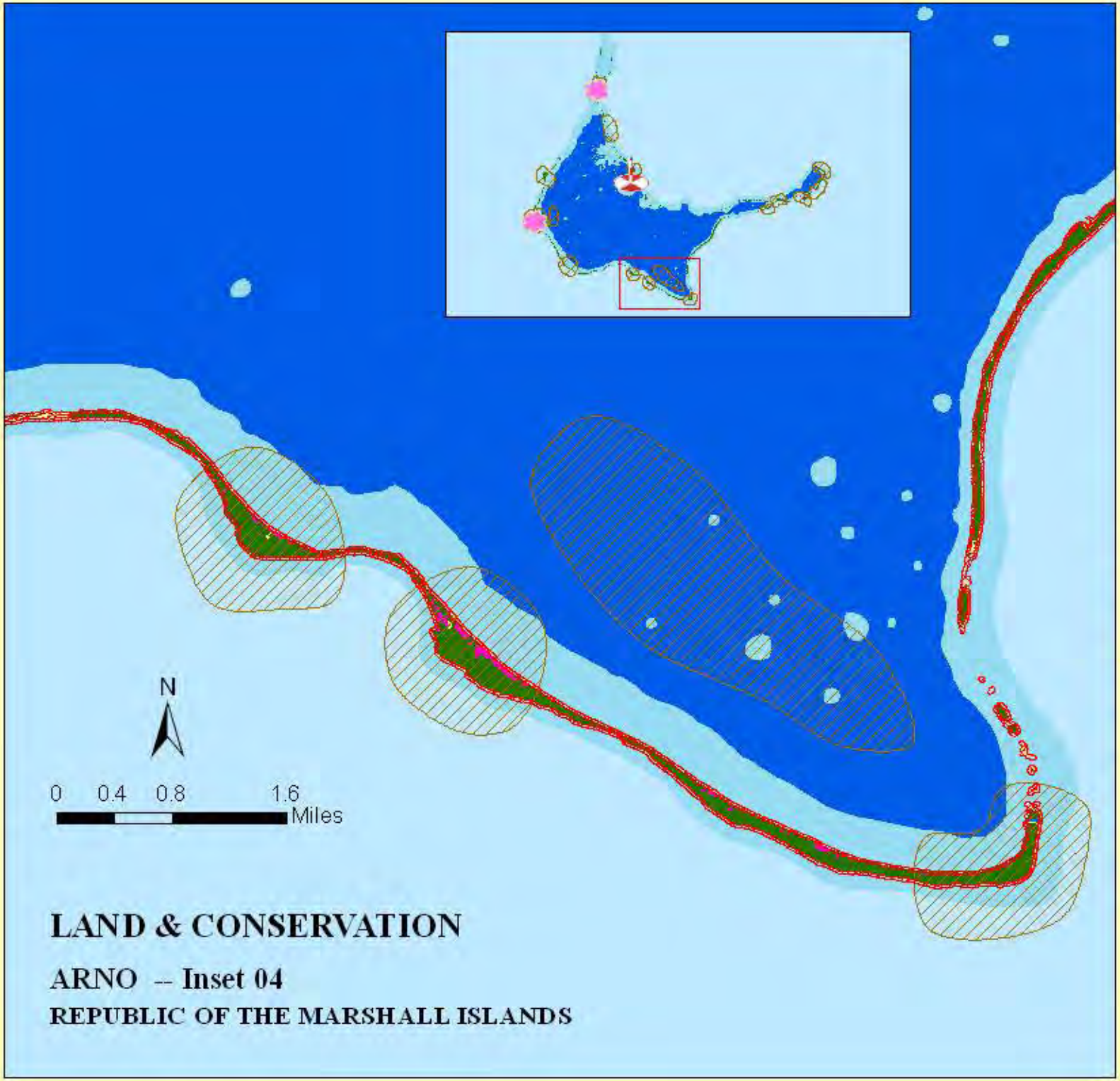

LAND & CONSERVATION

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REPUBLIC OF THE MARSHALL ISLANDS

Priority Area

- Conservation Areas
- Coastal Buffer Zone

Conservation Targets

- Crab population
- Breadfruit forest
- Climax forest
- Mangrove area
- Pemphis acidula forest
- Pond
- Shrubland/Grassland
- Windward forest
- Bwebwenato

Landcover

- Forest
- Rangeland
- Urban
- Barren
- Water

Landform

- Land
- Lagoon
- Others
- Airports

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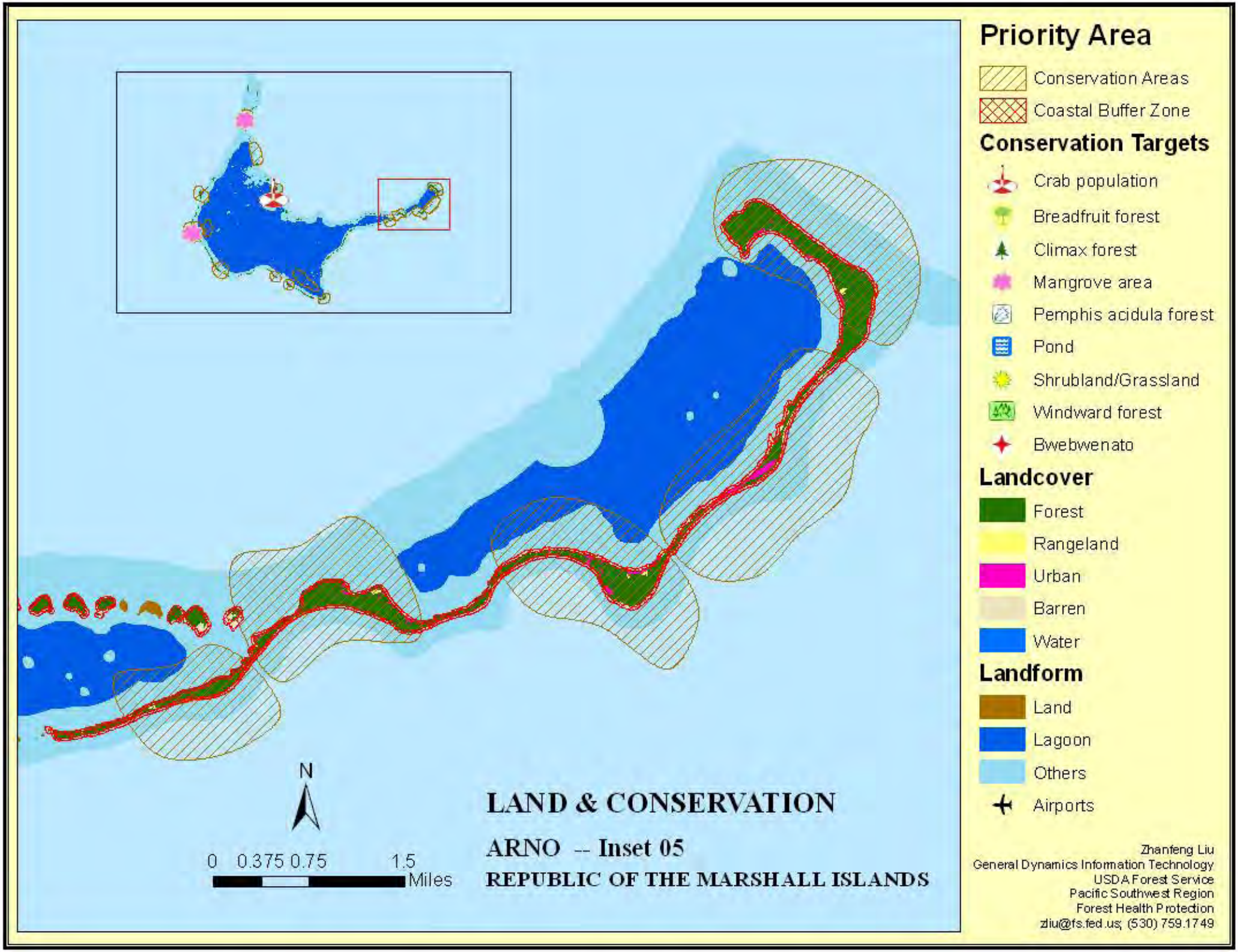
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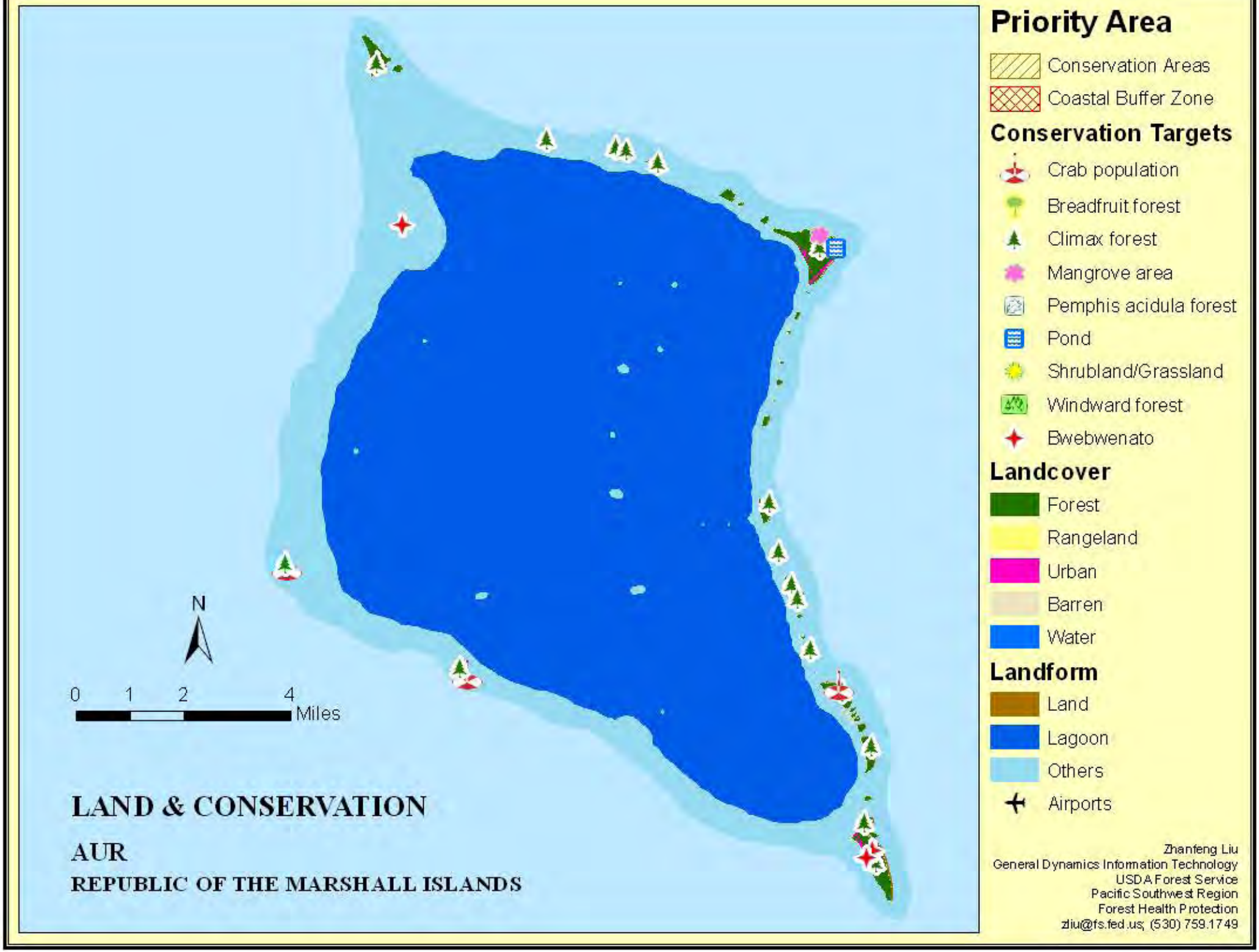
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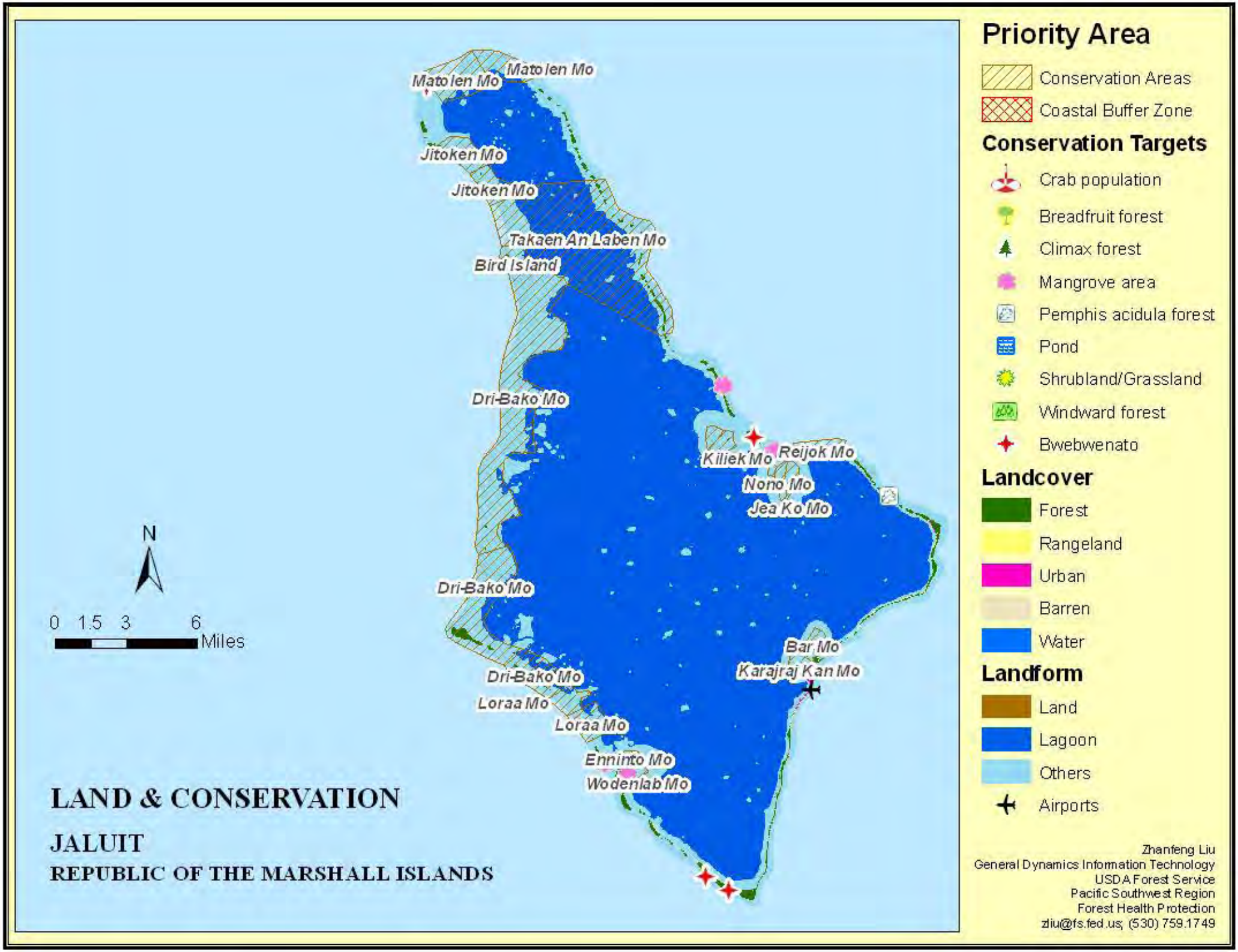
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Jitoken Mo
Takaen An Laben Mo
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Kiliek Mo
Reijok Mo
Nono Mo
Jea Ko Mo
Dri-Bako Mo
Bar Mo
Karajraj Kan Mo
Dri-Bako Mo
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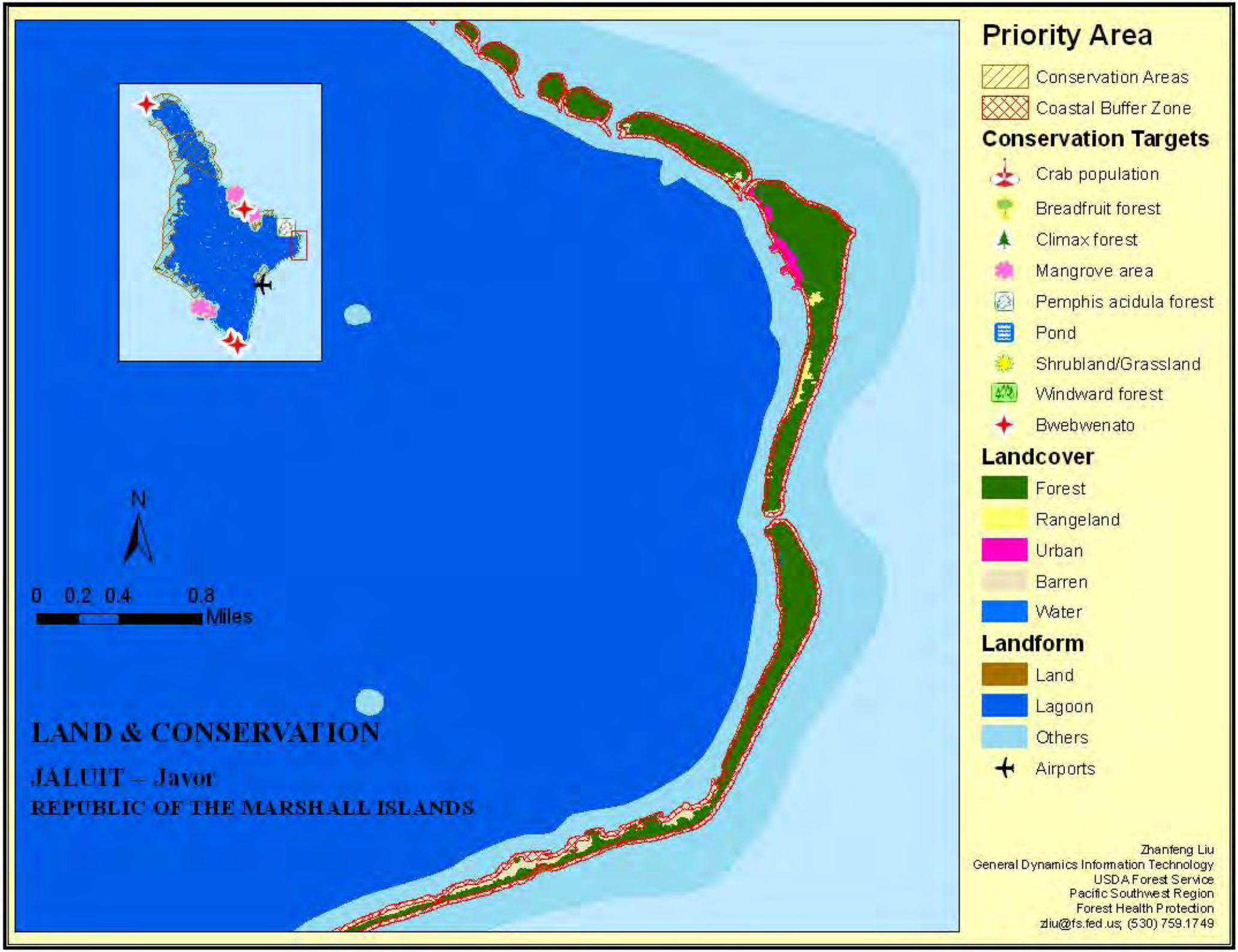
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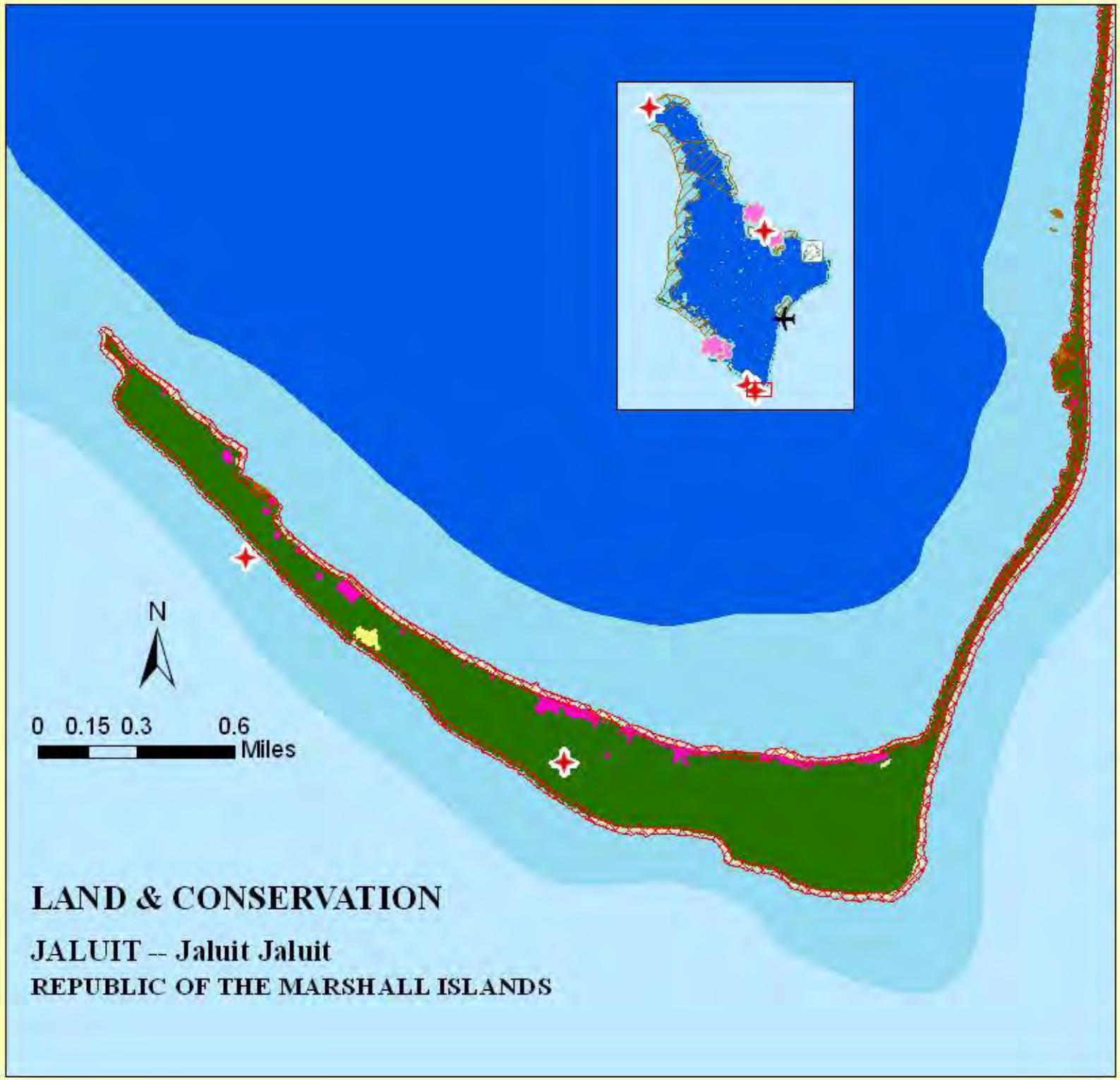

LAND & CONSERVATION

JALUIT -- Jaluit Jaluit

REPUBLIC OF THE MARSHALL ISLANDS

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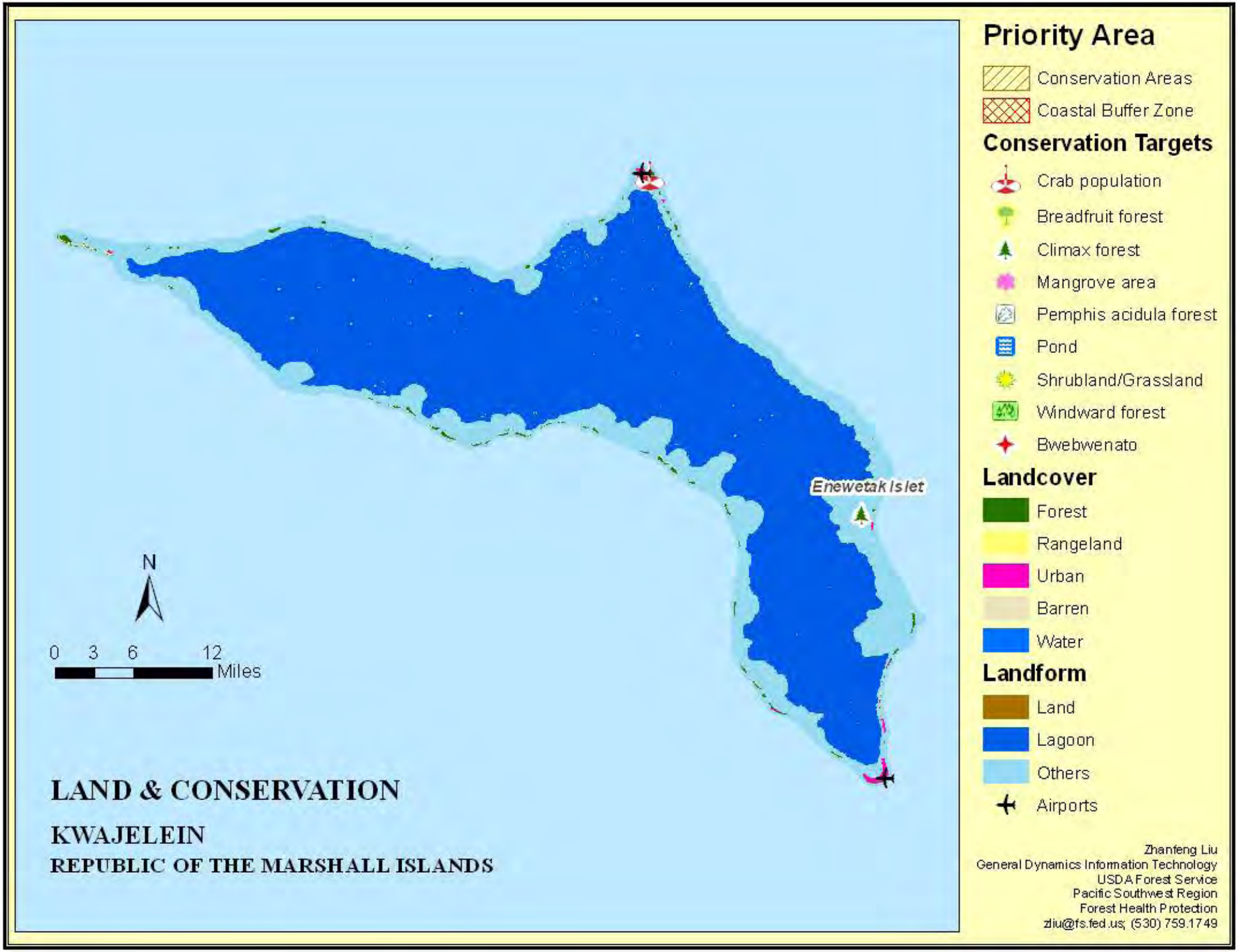

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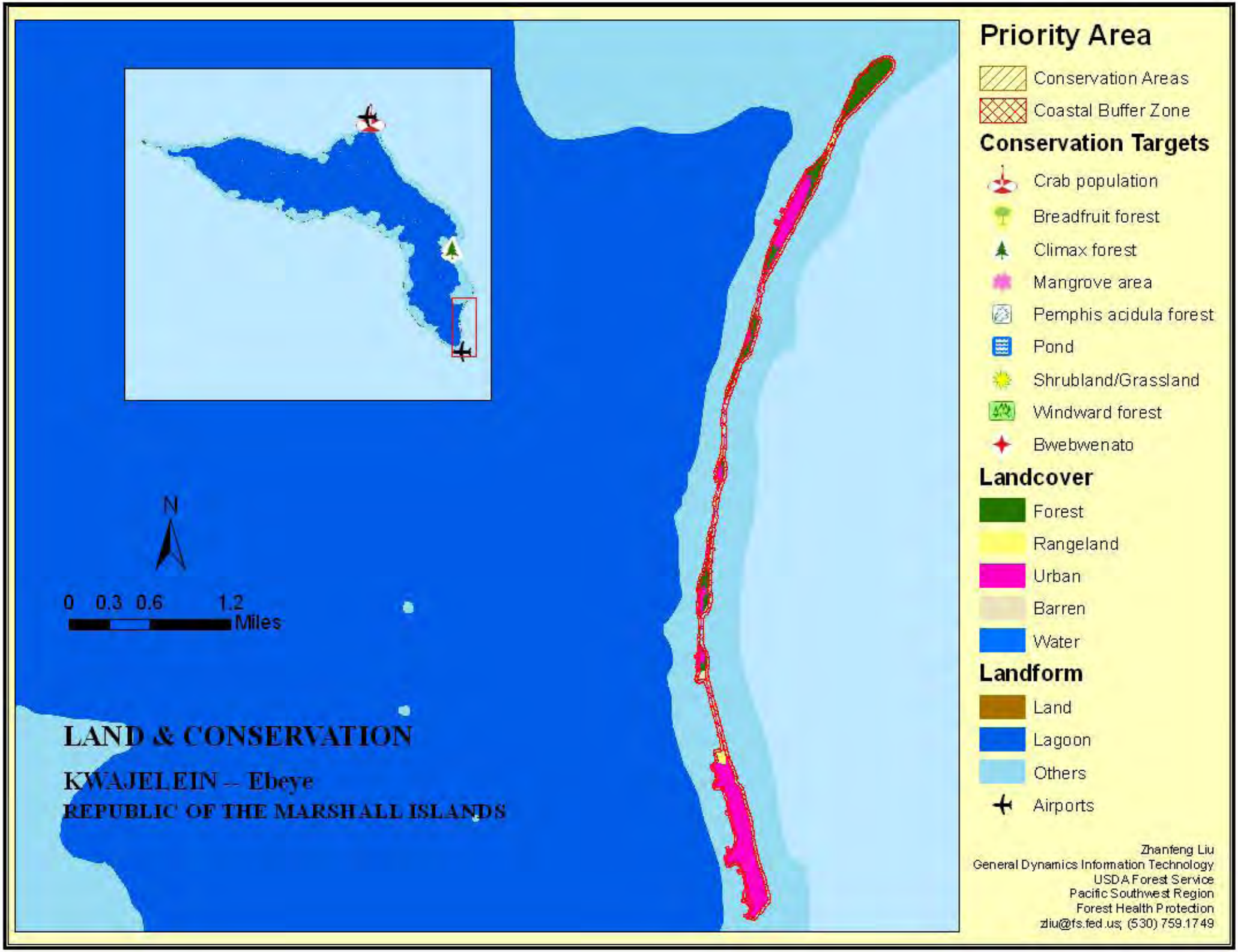
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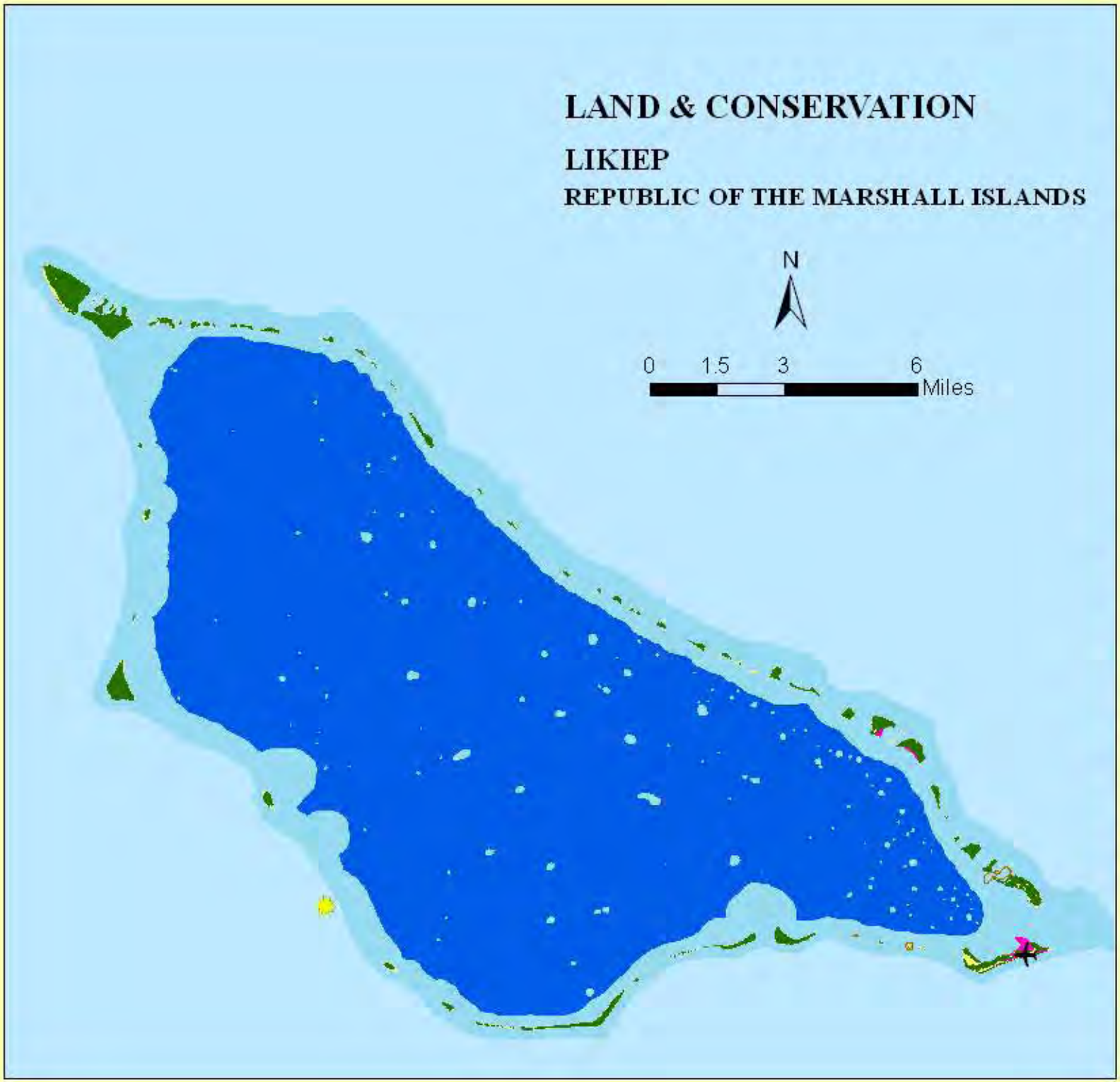
LIKIEP

REPUBLIC OF THE MARSHALL ISLANDS



Priority Area

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Conservation Targets

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- Breadfruit forest
- Climax forest
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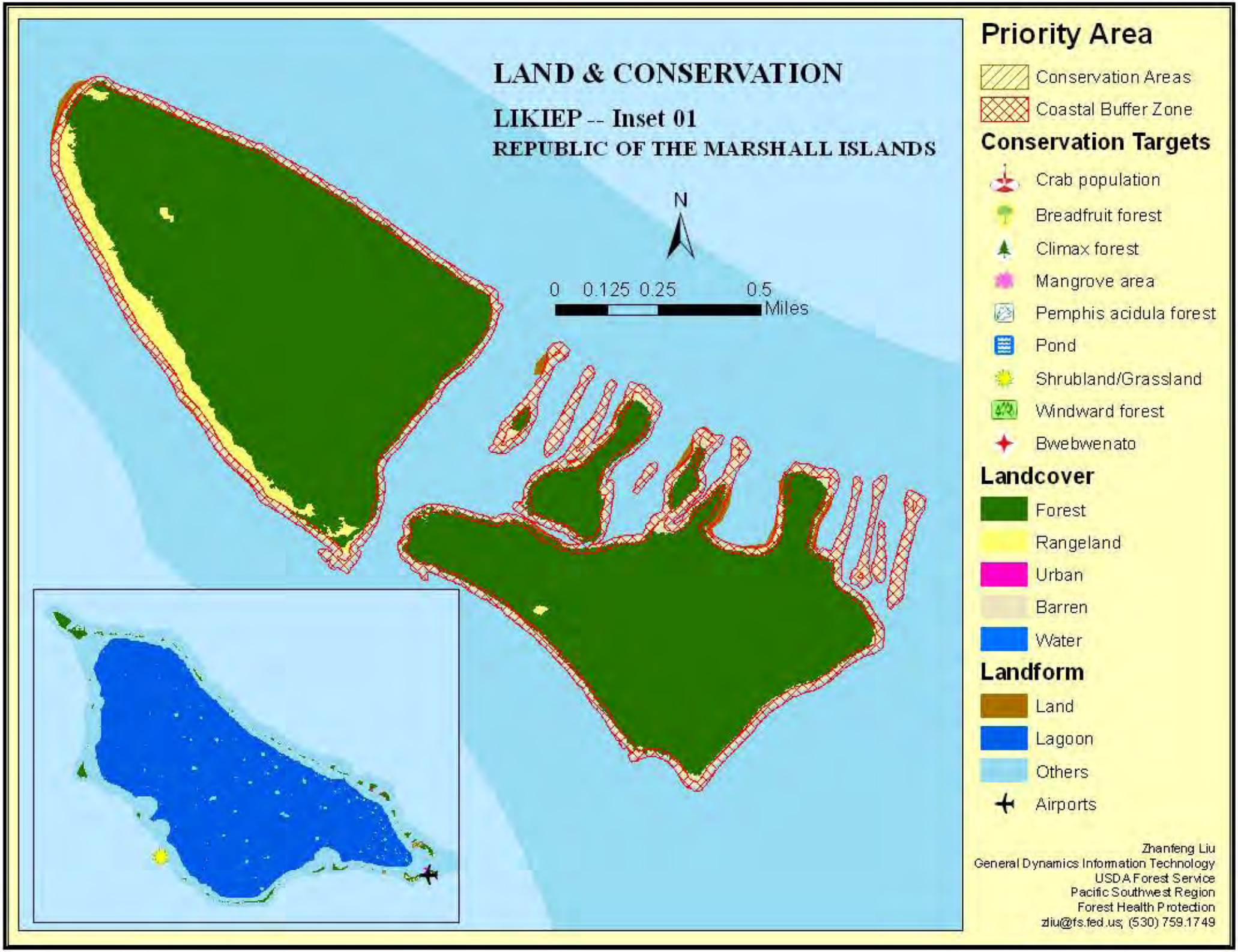
LAND & CONSERVATION
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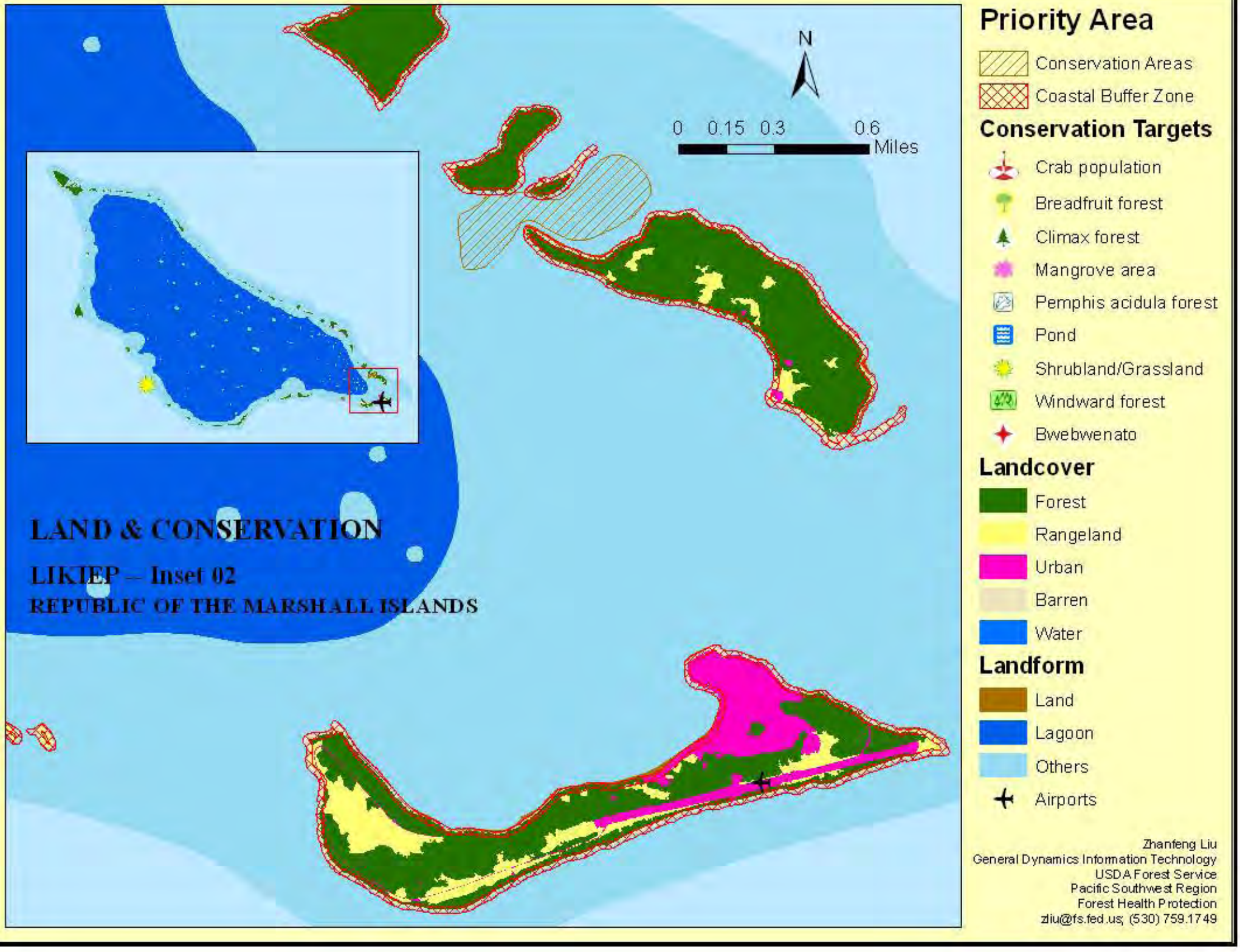

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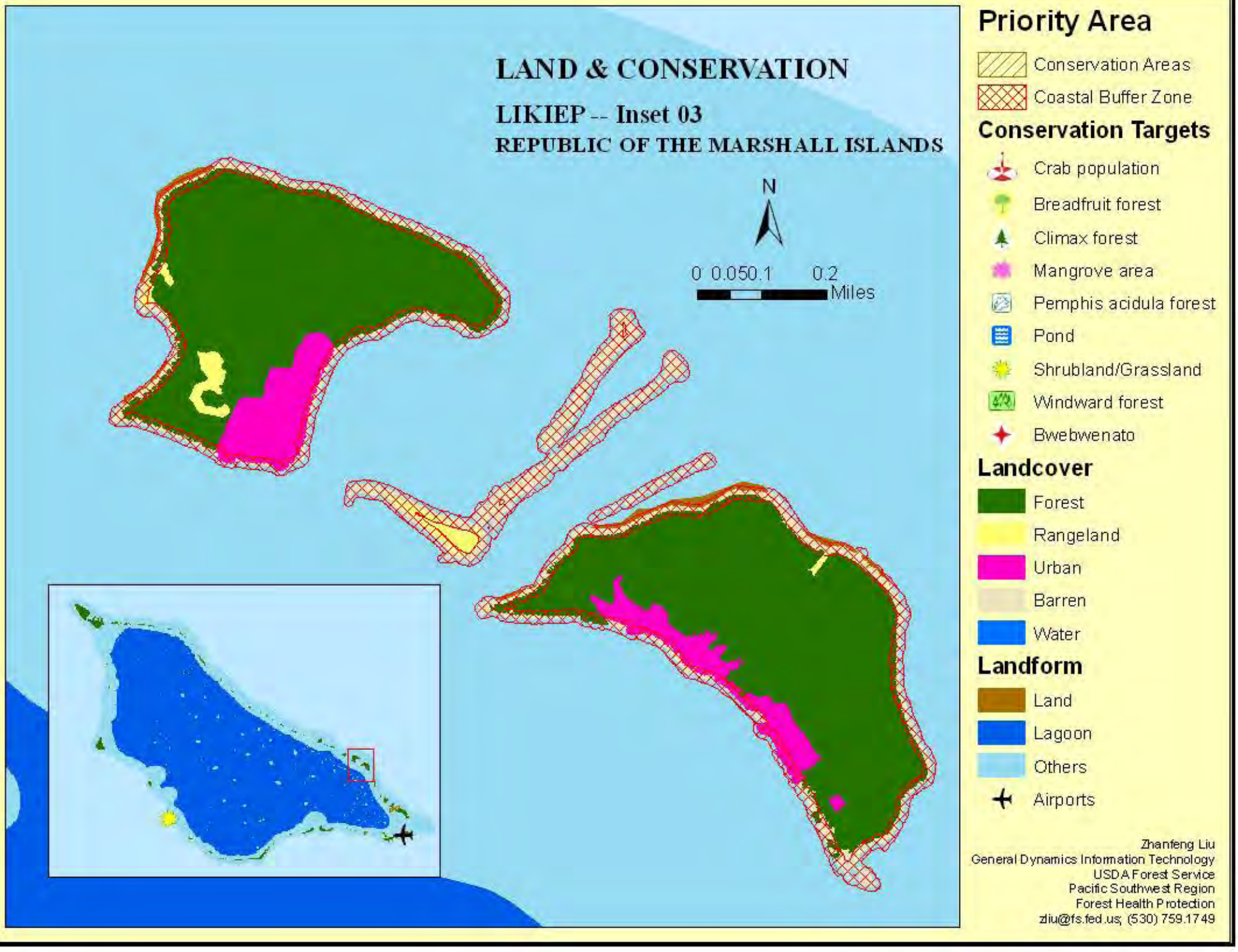
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LAND & CONSERVATION

MAJURO

REPUBLIC OF THE MARSHALL ISLANDS

Priority Area

- Conservation Areas
- Coastal Buffer Zone

Conservation Targets

- Crab population
- Breadfruit forest
- Climax forest
- Mangrove area
- Pemphis acidula forest
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Landcover

- Forest
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- Water

Landform

- Land
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LAND & CONSERVATION

MAJURO -- Laura

REPUBLIC OF THE MARSHALL ISLANDS

Priority Area

- Conservation Areas
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Conservation Targets

- Crab population
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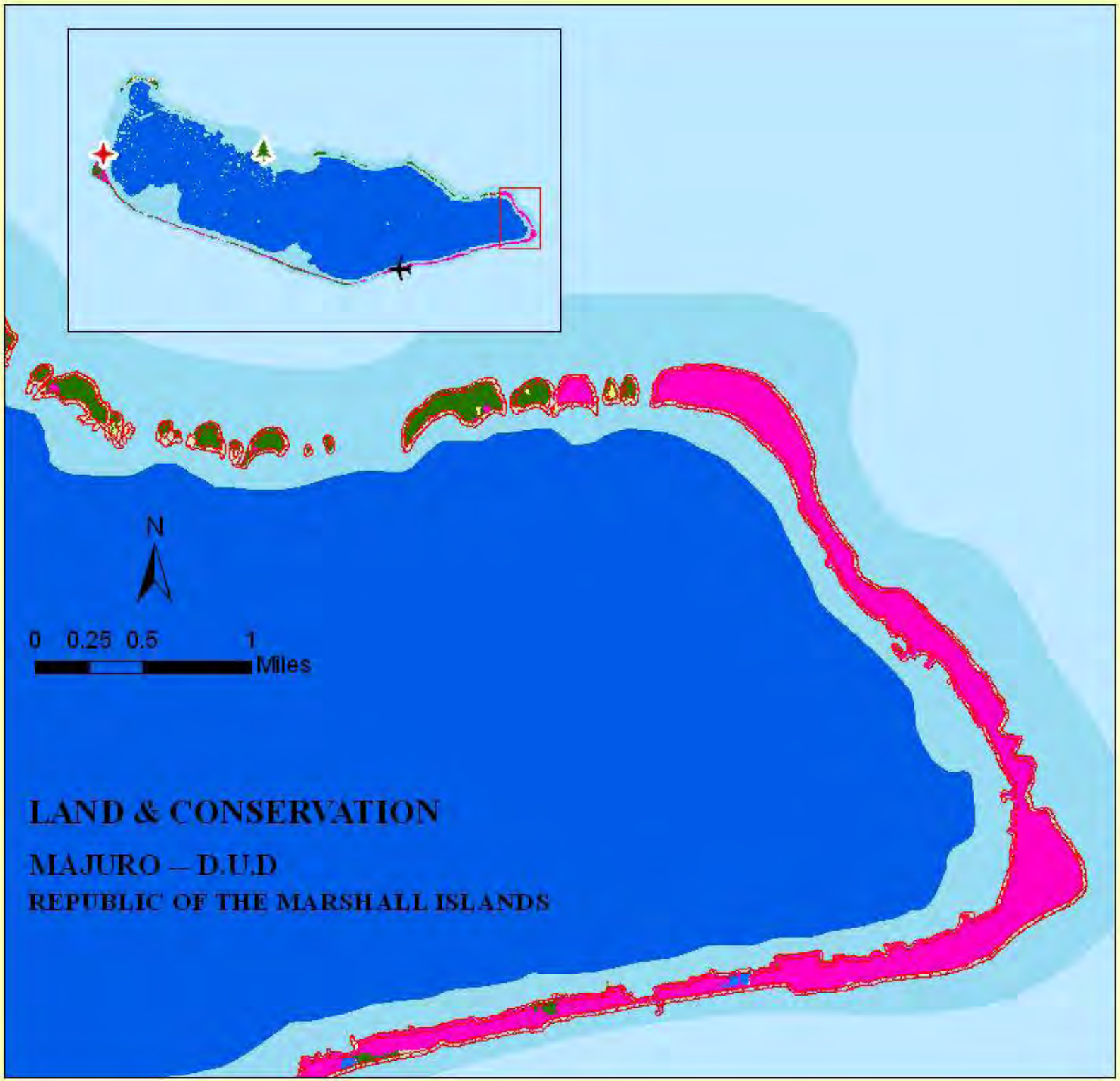

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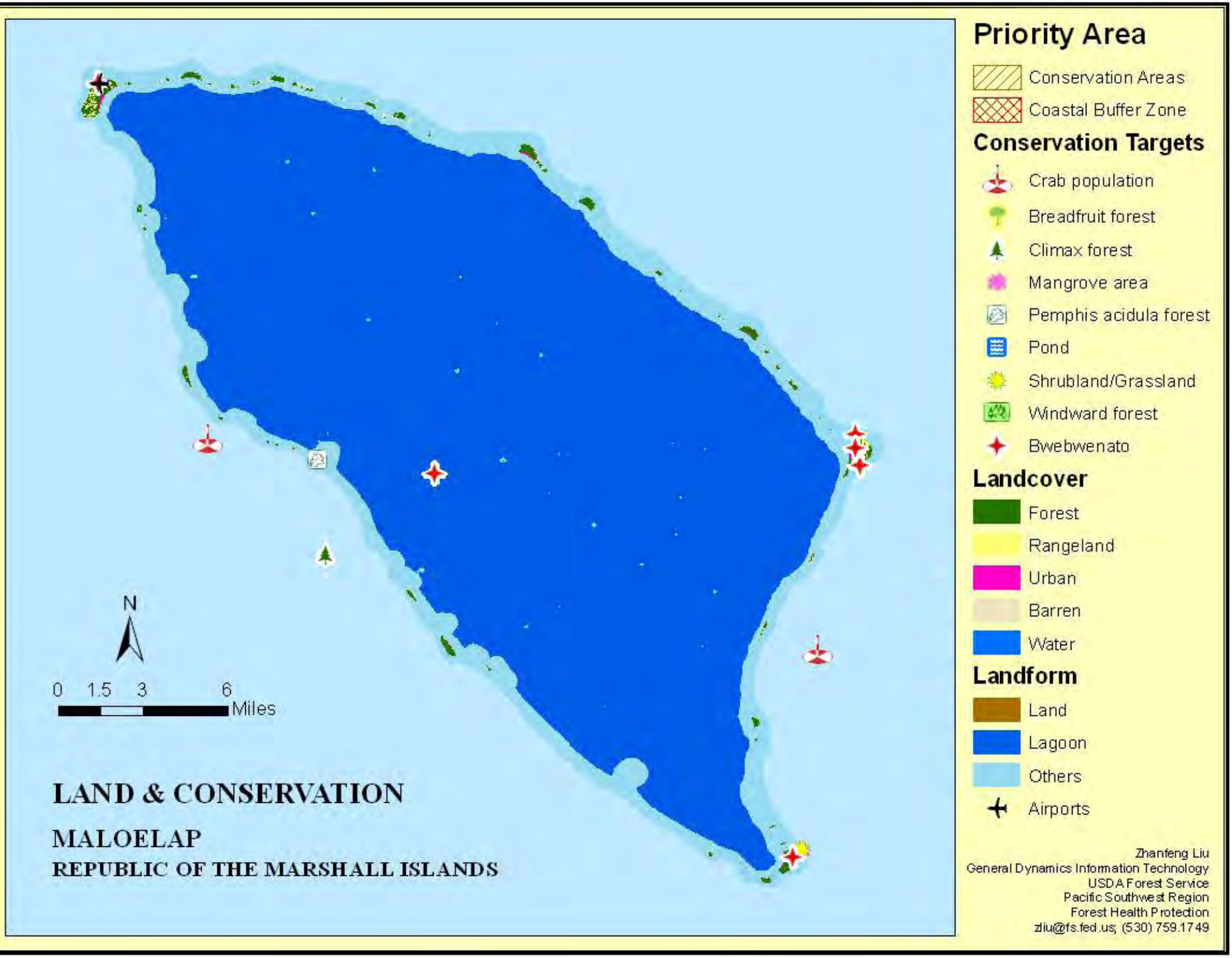
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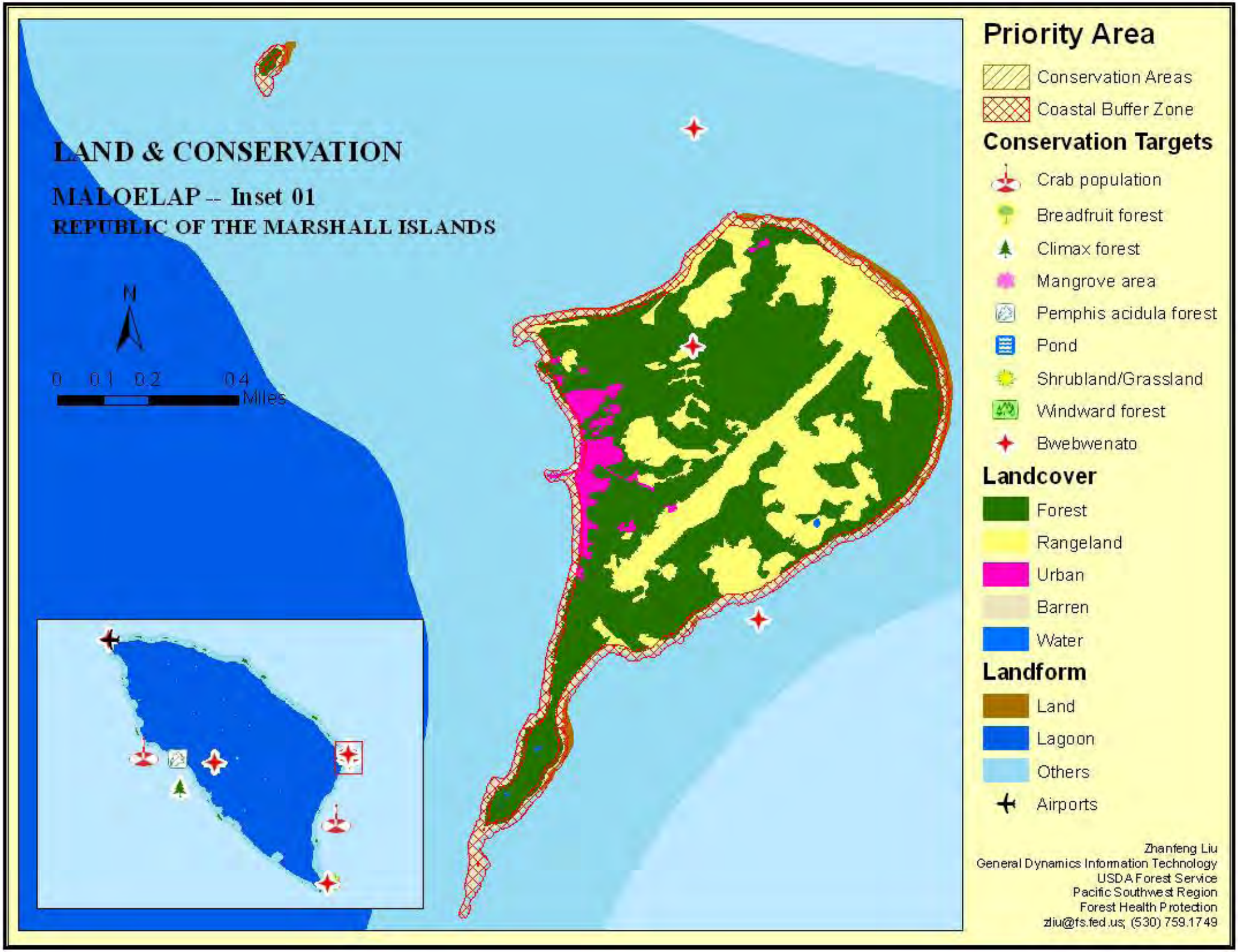
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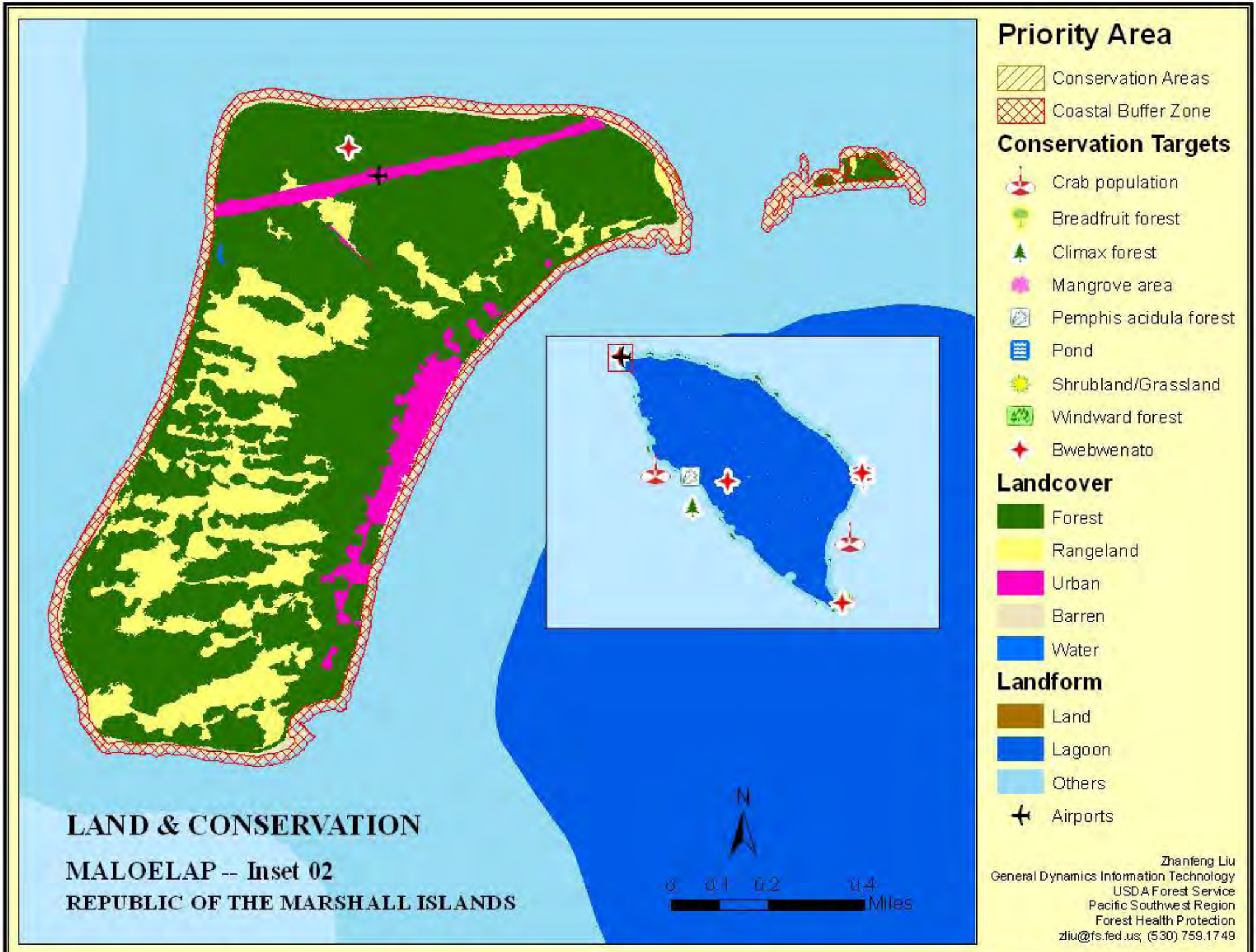
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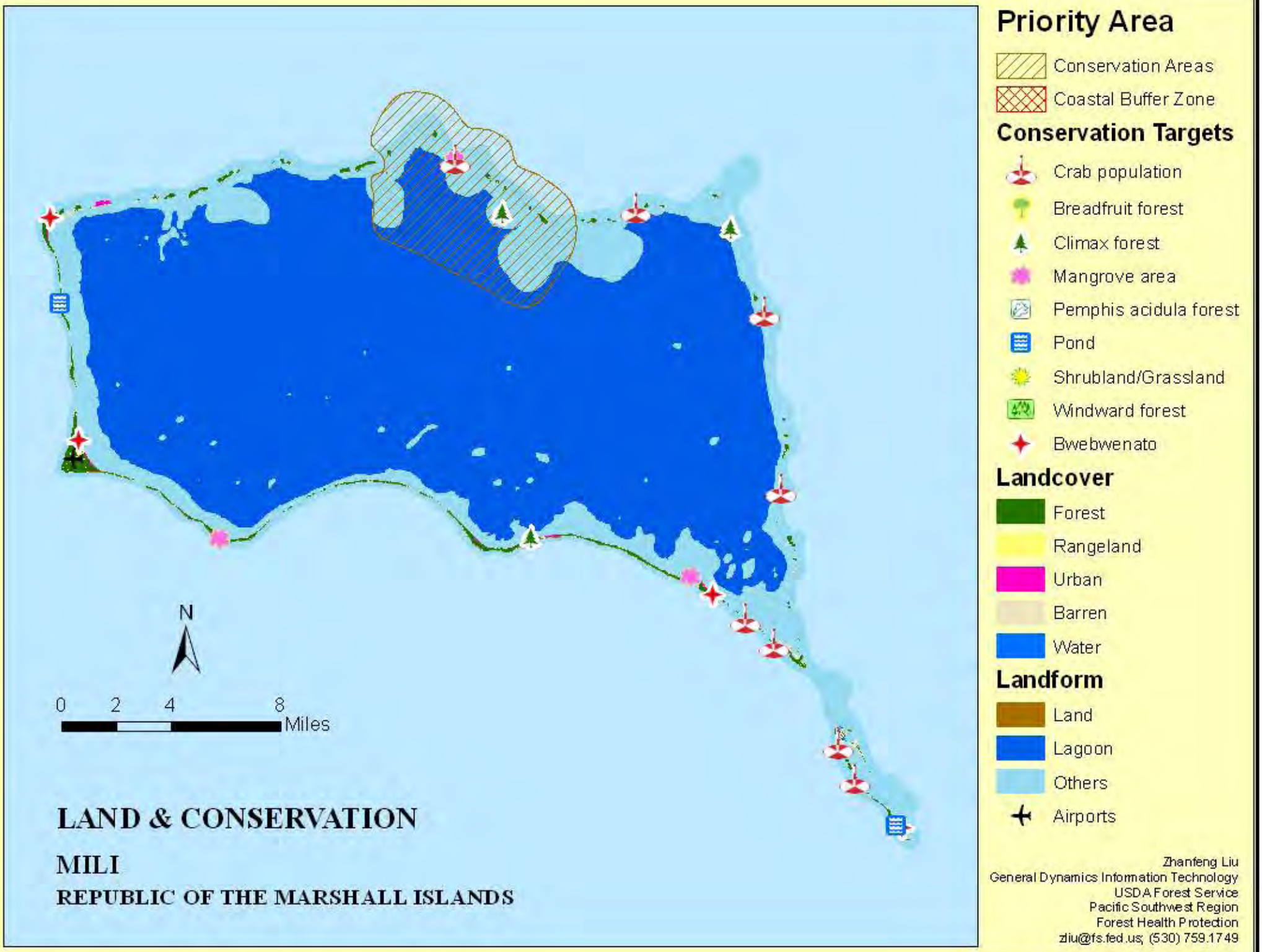
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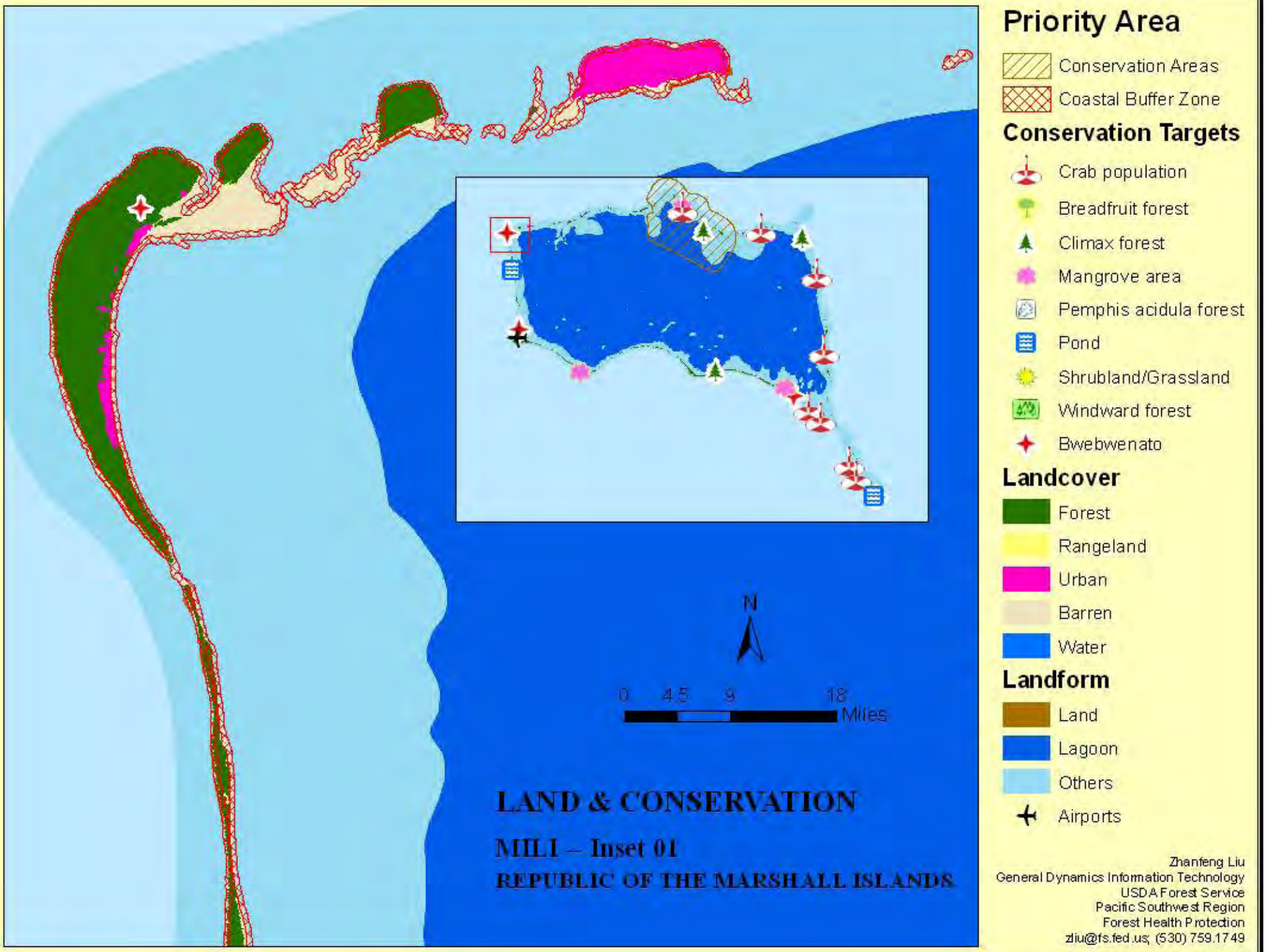
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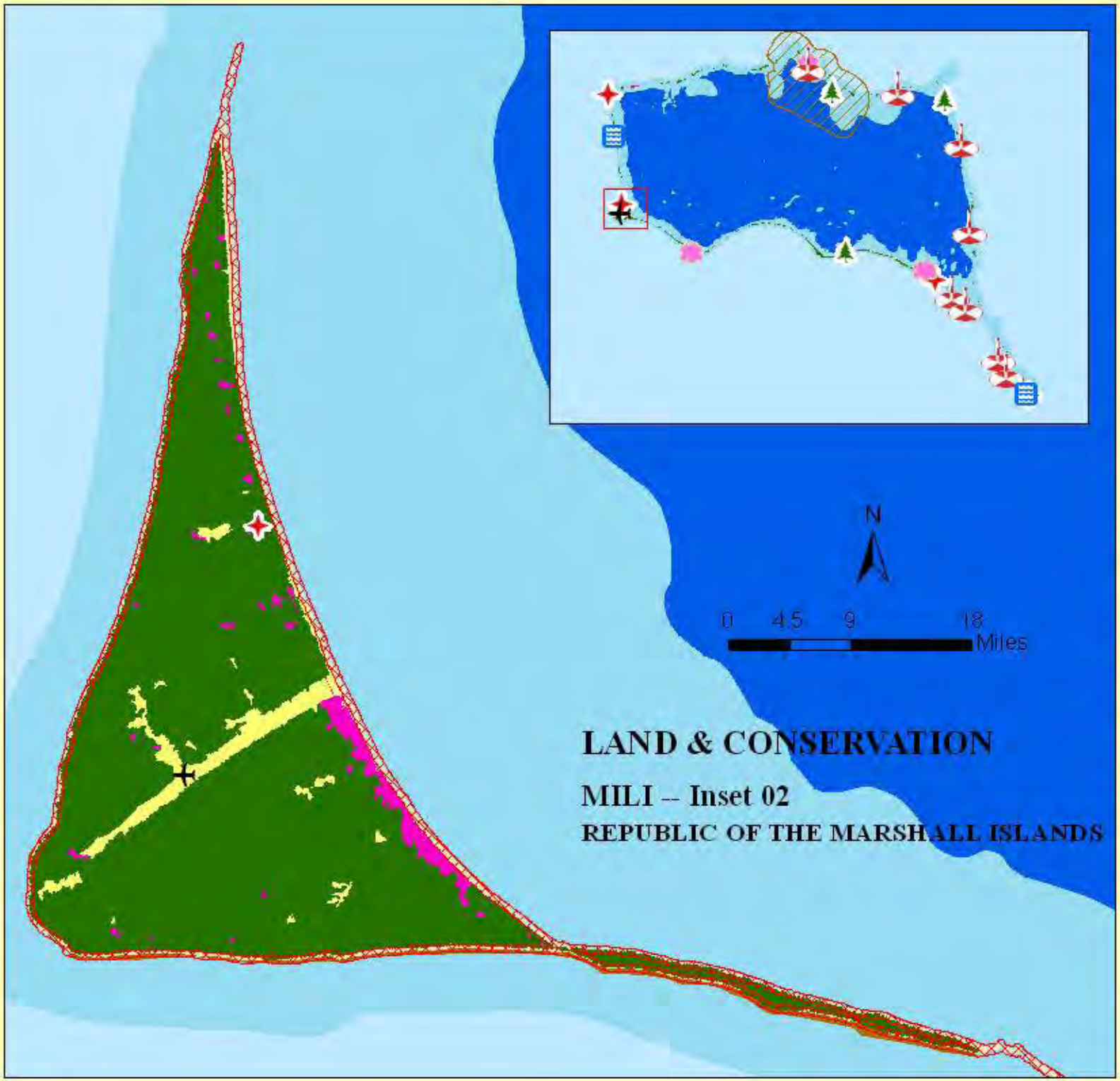

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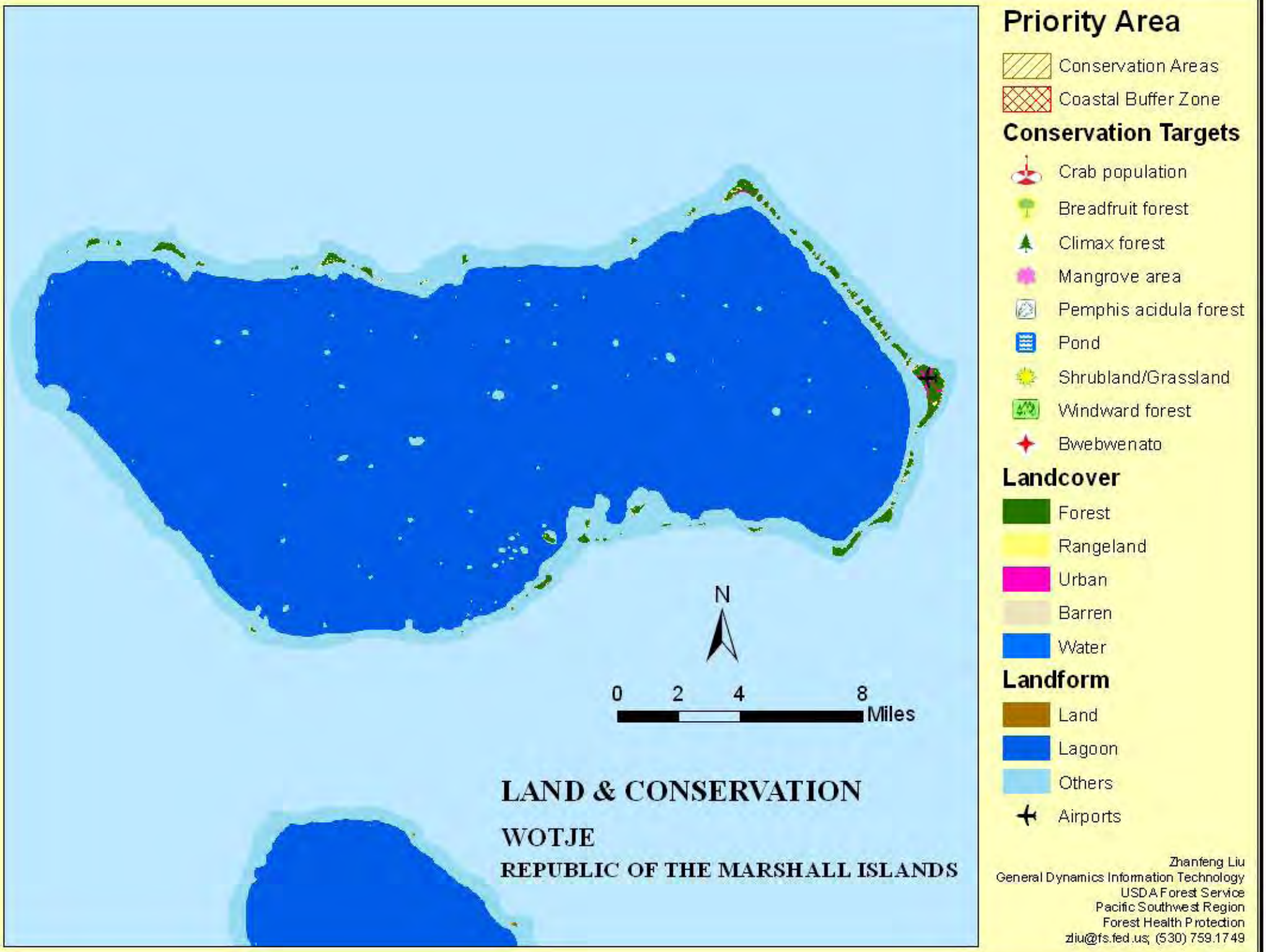
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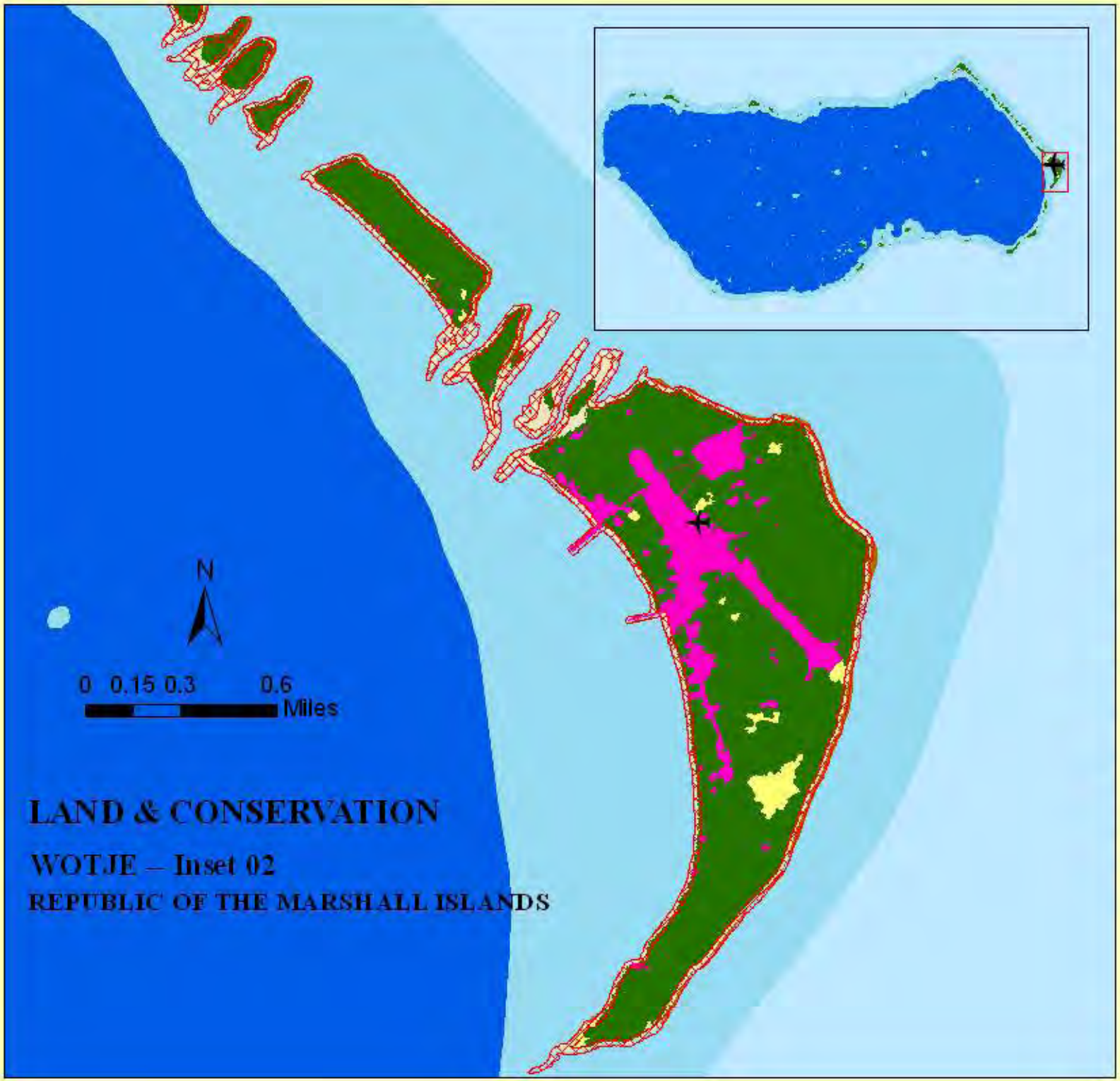

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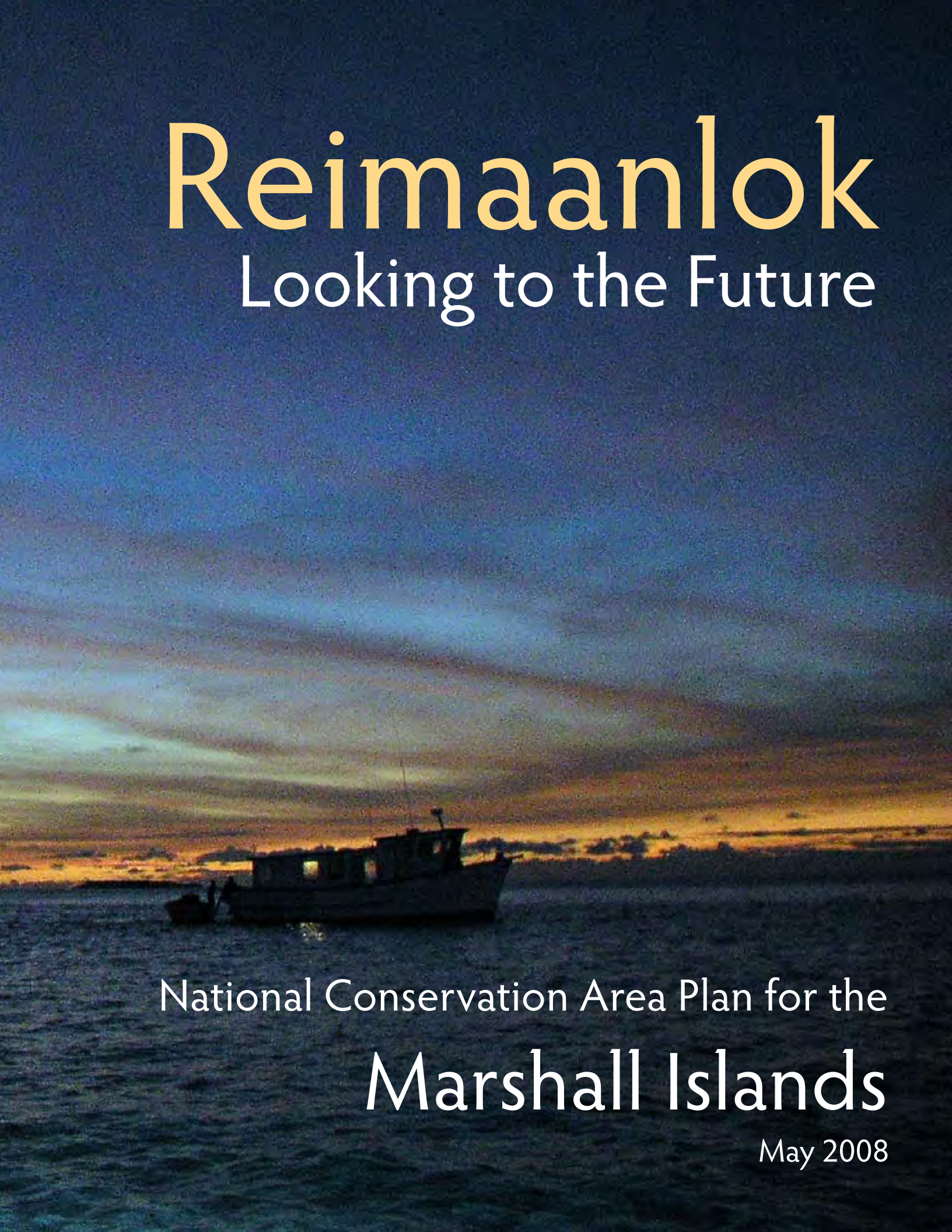

Reimaanlok

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, Water, Heritage and the Arts

Supported by...

Republic of the Marshall Islands
OFFICE OF ENVIRONMENTAL PLANNING AND POLICY COORDINATION

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AusAID

GEF

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Reimaan Team Leader
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Cover Photo: Photo: Jim Maragos, Ph.D., Reef ecologist. 2007

Table of Contents

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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Jeanine Almany (TNC) for thoughtful editing.

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.


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

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.**

opposite: juvenile brown-footed booby (Sula leucogaster) in flight

"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.

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*"[1]. 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[2], 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**[3] 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 ..."

Summary of Planning Process and Timeline

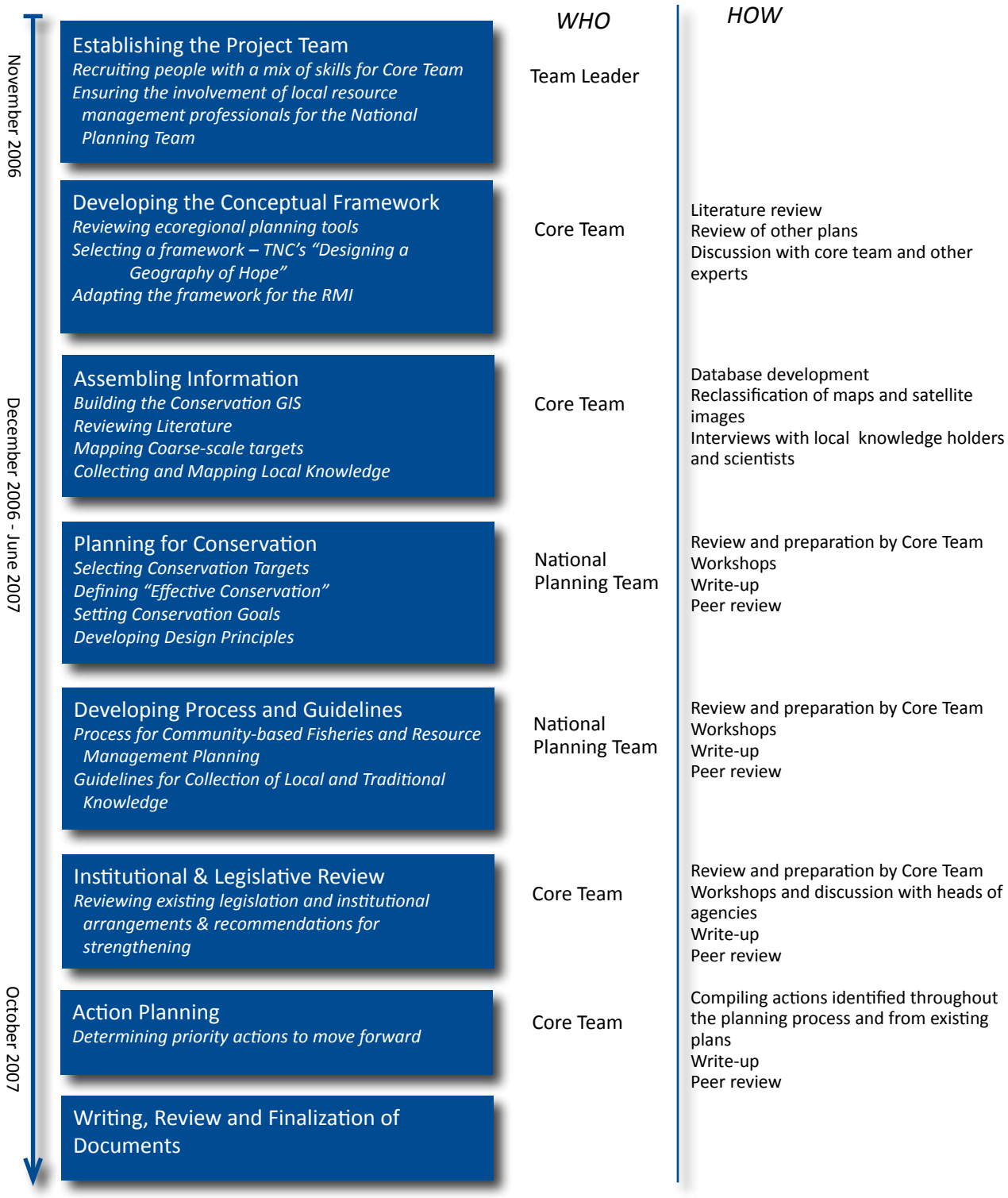


Figure 1: Summary of the Planning Process and Timeline

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)[4] of the Marshall Islands is over 2 million km^2 (770,000 sq. miles) and a mere fraction of that – less than 0.01% (183 km^2 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.

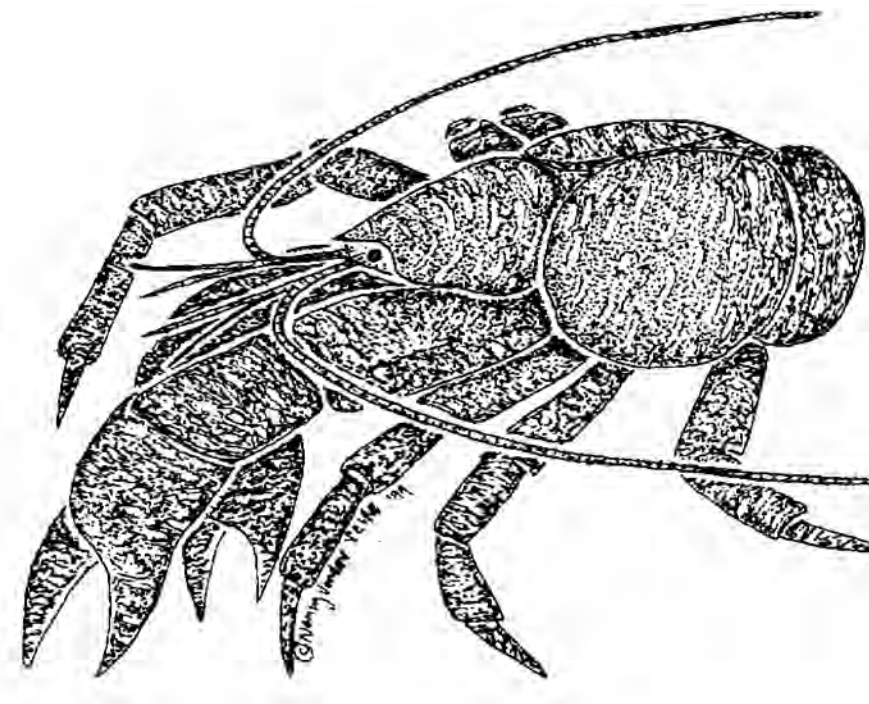
Part 2: Background and Context

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[5]. About 700 land animals have been identified, mostly insects, along with 80 indigenous vascular plants.[6]



Coconut crab (*Birgus latro*)

Our People, Our Land and Forests

With only 182km^2 (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.[7]

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.

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

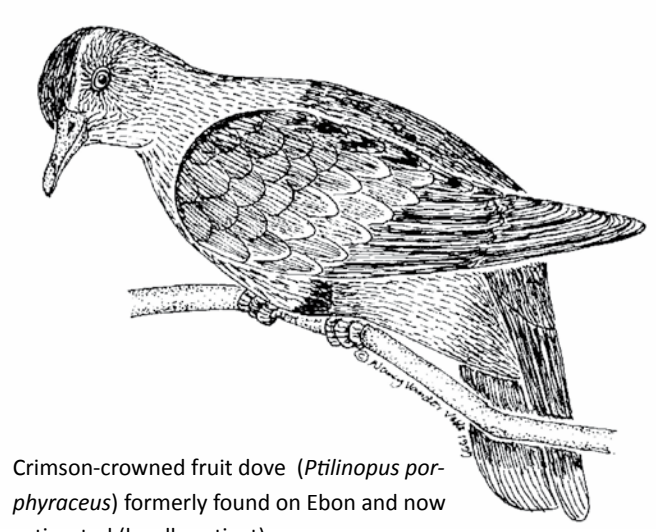
Overfishing is a threat to marine biodiversity everywhere and the Marshalls is no exception. With the decline of copra production and trade, many outer island communities are looking to other means of generating income and one key strategy for economic development is the establishment of commercial in-shore 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

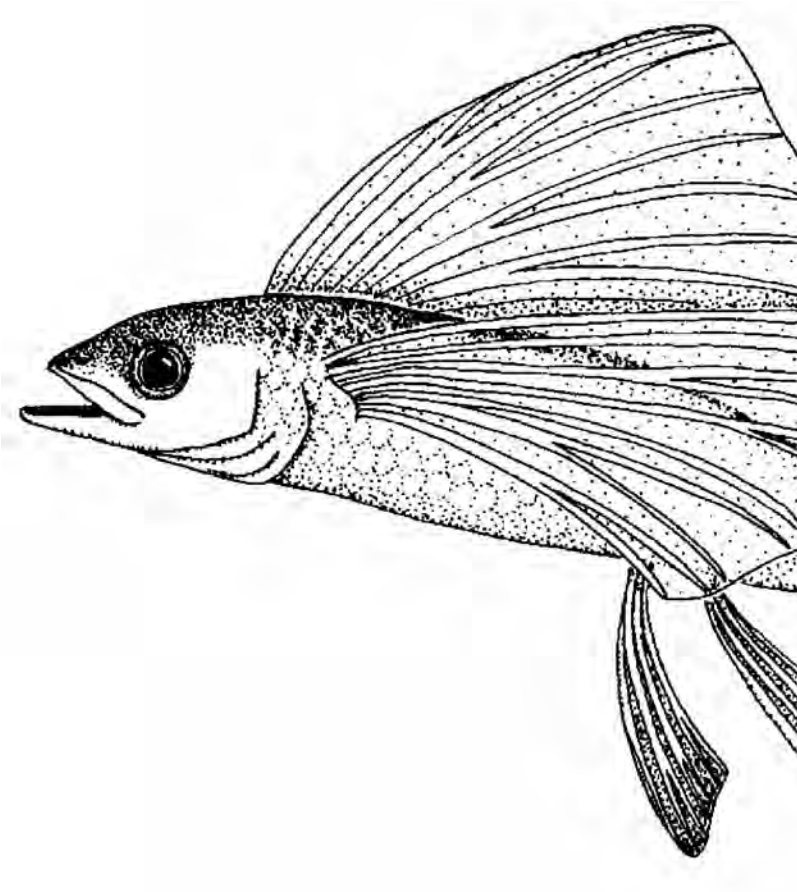
Nuclear History of the Marshall Islands

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.

2.3 A Brief History of Conservation in the Marshall Islands

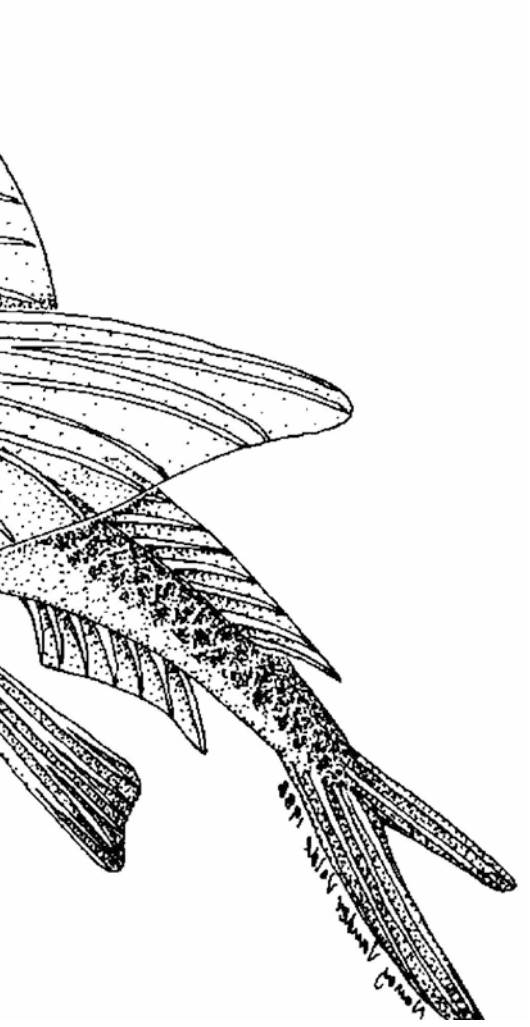
Traditional Environmental Management

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.[8]



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^2EIC [9] 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^2EIC 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^2 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^2 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.* [10]

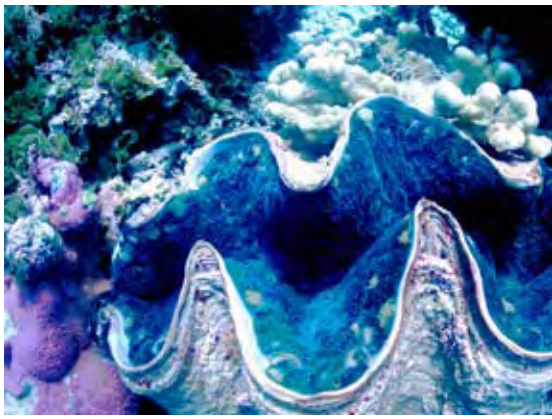
Conservation Targets are grouped into three types:

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

Table 1: Conservation Targets for the Marshall Islands

a. Coarse-scale Conservation Targets/ Environmental Units
Terrestrial
Agroforests
Indigenous broadleaf forests
Wetlands
Marine
Deep lagoon
Lagoon pinnacles
Lagoon slope
Ocean leeward reef *liklal*
Ocean Reef
Ocean Seabed
Ocean windward reef
Pelagic system
Reef flat
Reef pass and channel

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

c. Species Conservation Targets
Terrestrial
Aquatic shrimp
Arno skink
Horticultural species *bōb (Pandanus tectorius* clones), *iaraj* (taro)
Land crabs *atuñ, baru wan, barulep*
Avifauna
Bristle-thighed curlew *kuk-kuk/ kewak*
Great Frigatebird *toulōñ (f), ak (m)*
Micronesian pigeon (including the Ratak sub-species) *mule*
Short-eared owl
Short-tailed albatross
Marine
Bigeye tuna *bwebwe*
Black-lipped pearl oyster *di*
Bumphead parrotfish *mem*
Cetaceans
Cowries and other shells *libuke*
Fisheries target species
Game fishes
Giant clams
Giant grouper *kidriej*
Green sea turtle *wōn / jebake*
Other turtles *wōn*
Hawksbill turtle *jebake*
Lobster *wōr*
Manta ray *borañ*
Napoleon wrasse *lappo*
Rare coral species
Sea cucumber *jibenben*
Sharks *bako*
Spotted eagle ray *imel*
Three-banded anenome fish *banij*
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[11]), 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

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? [12]

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 Marshalls 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[13] committed to have at least 10% of the world's ecological regions "effectively conserved" by 2012[14]. 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% [15] works best for fisheries enhancement, while it is suggested that more than 30%[16] 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".[17]

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

a. Coarse-scale Conservation Targets/ Environmental Units	Type I Goal	Type II Goal
Terrestrial		
Agroforests	50%	-
Indigenous broadleaf forests	20%	10%
Wetlands	80%	-
Marine		
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
Terrestrial		
Bird Island	100%	50%
Breadfruit forest mā	100%	0%
Climax forest communities: *kañal (Pisonia grandis)* and *kōjbar (Neisosperma oppositifolium)* forests	20%	10%
Mangrove area *joñ, bulabol* and *kimeme*	90%	-
Pemphis acidula forest *kōñe*	100%	50%
Pond *pat*	60-80%	-
Shrubland and grassland	100%	50%
Turtle nesting beach	100%	100%
Windward forest *jāñar*	100%	-
Marine		
Clam site	50%	30%
Fish spawning aggregation area (SPAG)	100%	-
Point with extended ocean reef *bōke*	30%	-
Reef hole *nam*	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.

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^2)	Existing or Planned Conservation Areas (km^2)	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%
Total Nearshore Marine[18]	14066.6	2554.7	**18%**	**30%**[19]
Land	181.9	28.9	**16%**	**20%**[20]
Total	14248.8	2583.7	**18%**	-

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	**41%**	**100%**
Mangrove area	16	4	**25%**	**90%**
Turtle nesting beach	51	14	**27%**	**100%**

Current Status of Management on Different Atolls

Table 6, below, summarises the current status of management for atolls with conservation areas.

Table 6: Current Status of Conservation Areas in the Marshall Islands.

Atoll	Type of Protection and Management	Current Status
Ailinginae	Type II	Currently protected by ordinance. Management plan in preparation by local government and landowners for nomination to World Heritage list.
Ailuk	Type I	Management plan in preparation as part of MIMRA's community-based fisheries management.
Arno	Type I	Management plan developed and local government ordinances drafted. Not yet fully implemented.
Bikini	Type II	Currently protected by ordinance. Management plan in preparation for nomination to World Heritage list.
Jaluit	Type I and II	Management plan developed and local government ordinances drafted. Not yet fully implemented.
Likiep	Type I	Management plan developed and local government ordinances drafted. Not yet fully implemented.
Mili	Type II	Management plan drafted but not yet implemented.
Rongelap	Type I	Currently protected by ordinance.
Rongerik	Type I	Currently protected by ordinance.

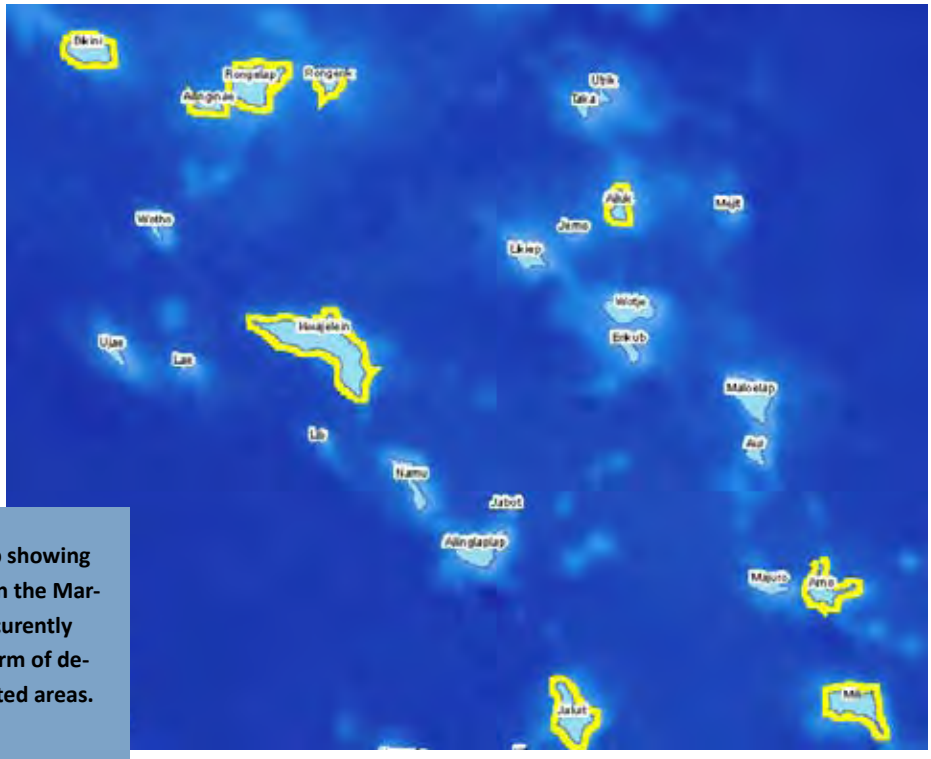


Figure 4: Map showing which atolls in the Marshall Islands curently have some form of declared protected areas.

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[21,22], Palau's Protected Area Network[23], Kimbe Bay[24] 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^2 but Napoleon wrasse needs a

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.

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[25], and some were visited in 1992[26] 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 identifyi appropriate sites for protection and management.

Data on Terrestrial Coarse Scale Targets

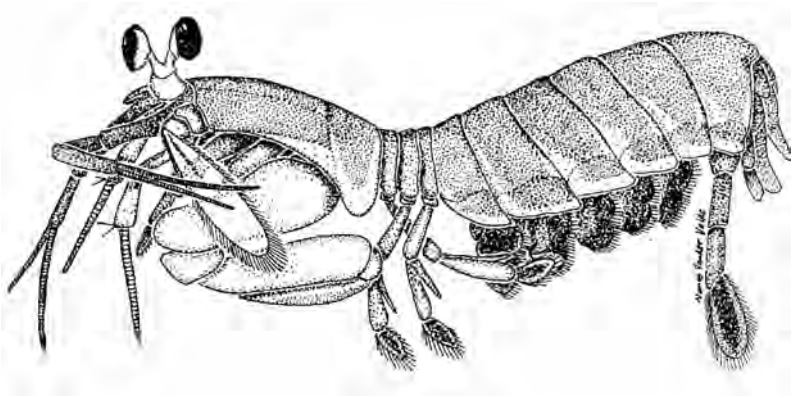
While data on marine coarse-scale targets was obtained from reclassified satellite imagery, there are no recent terrestrial vegetation maps of the Marshall Islands. It would, however, be possible to obtain the extent and occurrence of coarse-scale terrestrial targets from a manual reclassification of 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[27, 28]. 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[29]. 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

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).

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**

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[30];
- 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.

Tranquil beauty of Ailinglaplap Atoll.

National Resource Management and Conservation Organizations

Marshall Islands Marine Resources Authority (MIMRA)

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

Republic of the Marshall Islands Environment Protection Authority (RMIEPA)

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

College of the Marshall Islands (CMI)

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

Marshall Islands Visitors Authority (MIVA)

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

Office of Environmental Policy and Planning Coordination (OEPPC)

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

Marshall Islands Conservation Society (MICS)

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

Ministry of Resources & Development (R&D)

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

Natural Resources Assessments Surveys Marshall Islands (NRAS)

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

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

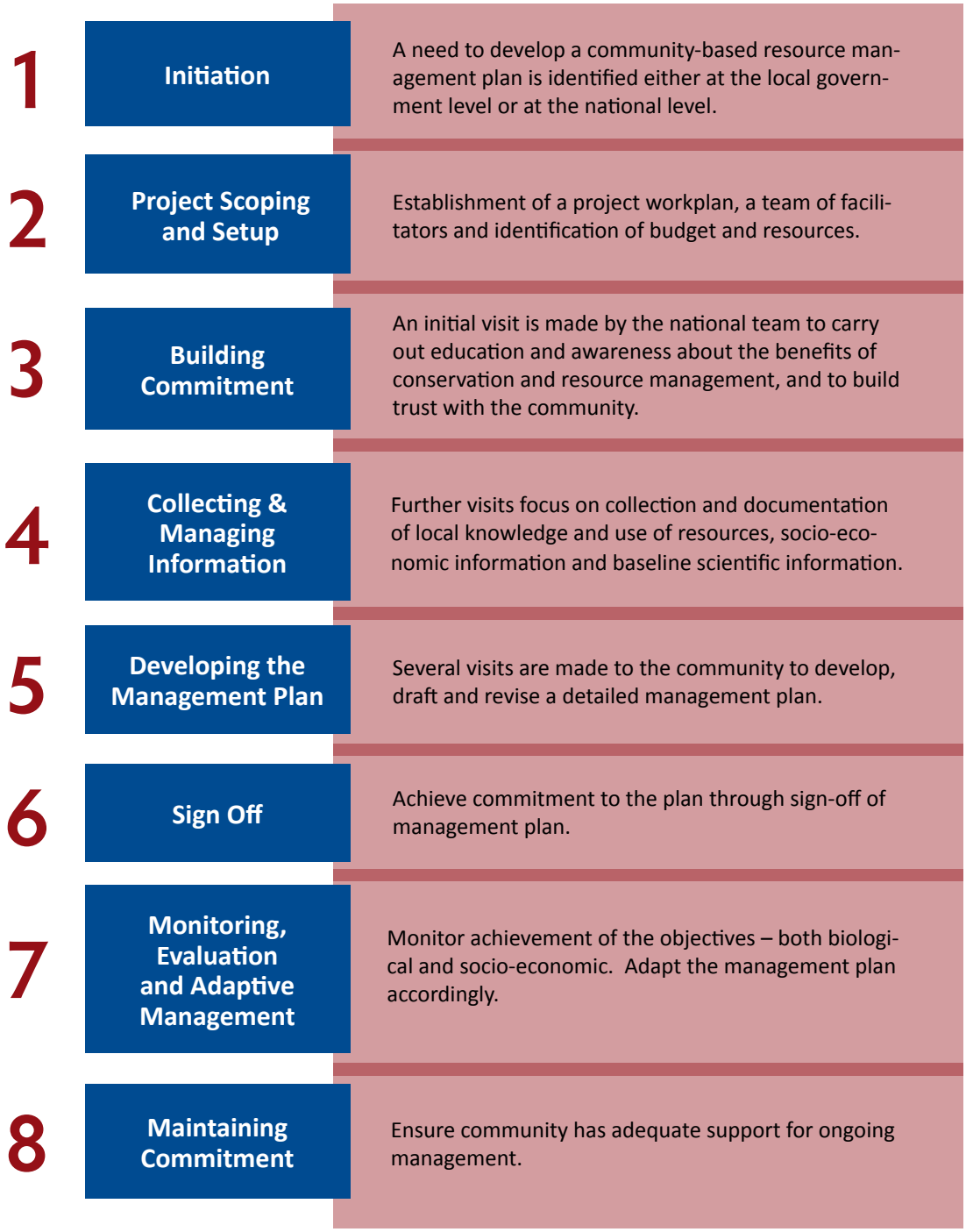


Figure 5: Summary of the Process for Community-Based Fisheries and Resource Management Planning

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 *[under development]*

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.

Organizational Arrangements

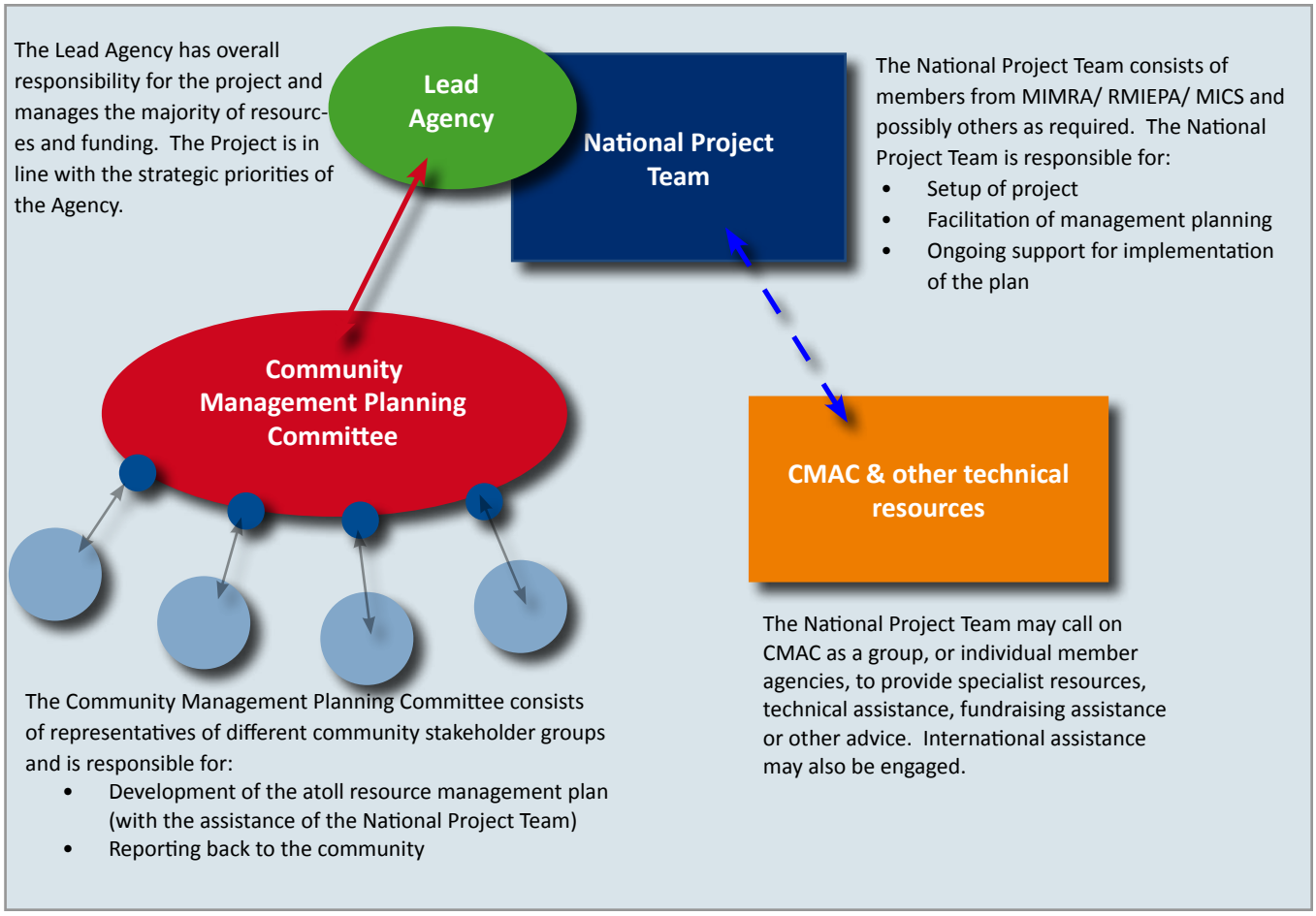


Figure 6: Organizational Arrangements for Developing a Community-Based Management Plan

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:

Activity	***Suggested Tools/ Resources***
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 *bwebwenato* 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. *[under development]*
Survey questionnaire to assess level of understanding and commitment	Standard Survey- [*under development]*

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

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	*Guidelines for Collection of Local and Traditional Knowledge and mo in the Marshall Islands*

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	*SEM-Pacifika socio-economic monitoring toolkit. SPC socio-economic survey method .*

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)	*There is a need to develop tools/ methods to assist with this.*
Quantitative** survey by external experts / volunteer scientists and staff of National Project Team combined with local knowledge.	*NRAS survey methods* or other standardized international survey protocols for marine and terrestrial resource assessments.

* 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 is 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:

Activity	***Suggested Tools/ Resources***
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"	*Guidelines for Collection of Local and Traditional Knowledge and mo in the Marshall Islands* (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	*Marshall Islands Conservation Area Design Principles* Utilize voluntary advice from conservation planners via email or Skype.
Determine authority and responsibility	*There is a need to develop tools/ methods to assist with this.*
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 *[to be developed]*
Present draft ordinances	Template for ordinances *[to be developed]*

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:

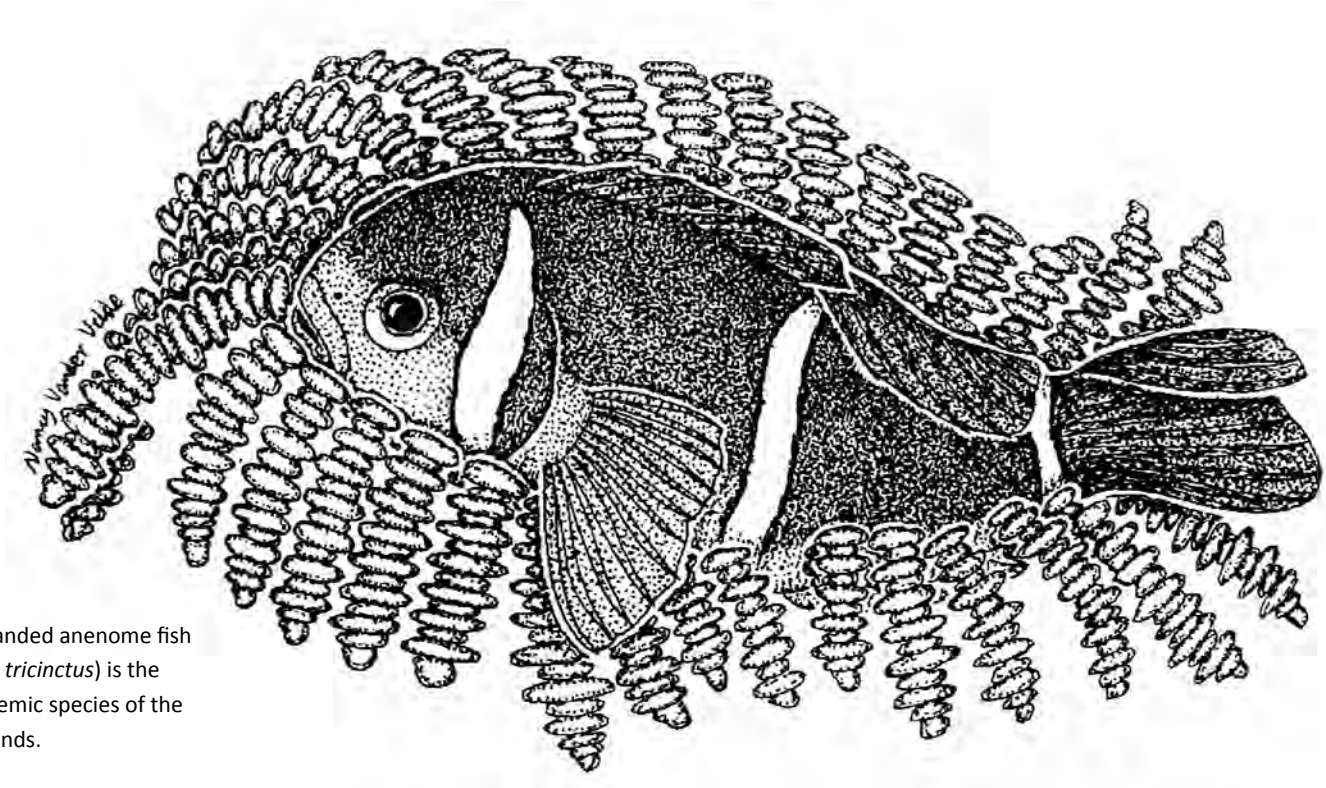
- Maps and datasheets of natural resource and conservation targets and uses
- Draft management plan

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 thier intent to implement management strategies while developing local laws to be implemented at a later date.



The three-banded anenome 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.

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[31]. 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[32].

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."[33] 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

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

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

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.

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.

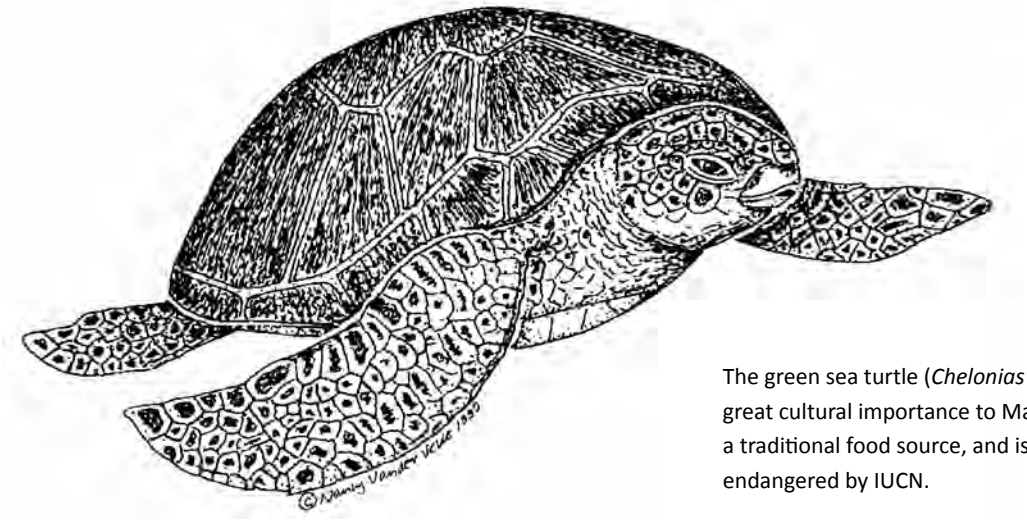
In the medium to long term, however, it will be useful to review the entire conservation-related national legislation and institutional responsibilities. This would allow some overlapping jurisdictions to be clarified, and could institutionalize inter-agency cooperation arrangements that are, as yet, 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 (*Chelonias 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[32].
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.
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 .
23. TNC. 2006.
24. TNC. 2007.
25. Thomas et al. 1989.
26. Puleloa et al. 1992.
27. Antartic and Southern Ocean Coalition. 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 I: Record of Formal Meetings and Workshops

		Project Meetings	Inception Meeting	Local and Traditional Knowledge 1	Local and Traditional Knowledge 2	Steering Committee 1	Selecting Conservation Targets	Conservation Objectives Discussion	Lessons Learned Workshop	Zoning Workshop	Conservation Planning Workshop	Final Workshop- GIS, Legislative Review
		Date	27/11/2006	1/12/2006	6/12/2006	8/12/2006	12/12/2006	15/12/2006	28/02/2007	6/03/2007	26/04/2007	17/05/2007
ICEM	Nicole Baker		1	1	1	1	1	1	1	1	1	1
	Caleb McClennen		1	1			1	1	1	1	1	1
	Graham Baines				1	1	1	1				
	Maria Beger		1								1	1
	Joy Kawakami		1	1			1	1	1	1	1	1
	Moriana Phillip				1		1	1				
MIMRA	Glen Joseph		1	1		1			1			
	Albon Ishoda			1			1	1	1	1	1	1
	Terry Keju		1	1								
	Florence Edwards		1	1	1				1	1	1	1
	Melba White								1			1
	Emma Kabua							1	1		1	1
OEPPC	Deborah Barker		1	1		1						
	Ned Lobwij		1	1	1		1	1				
	Jeffrey Zebedy		1	1			1					
RMIEPA	John Bungitak					1			1	1		1
	Andrew Finlay								1	1	1	1
	Miram Ankeid										1	
	Riyad Mistry								1	1		
R&D	Karness Kusto										1	1
MIVA	Emelyn Simon								1	1	1	1
	Neiar Kabua		1	1	1		1	1		1	1	1
MICS	Elai Isaia									1	1	1
	Candice Guavis								1	1	1	1
	Steve Why									1		1
CMI	Don Hess		1				1		1	1		1
	Dean Jacobsen		1				1		1	1		1
	Frankie Harriss						1	1				
	Nancy Vandervelde						1					1
	Brian Vandervelde						1					1

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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. 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
Terrestrial				
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%		
Marine				
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. *Acropora rongelapensis* 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 passand 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
Terrestrial					
Bird Island		Description: Areas where birds congregate to roost, rest and/or nest. Importance: 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	*mā*	Description: An agroforest dominated by breadfruit (*Artocarpus* sp.). Importance: food security, cultural significance, often a nesting area for endangered Micronesian pigeon, *Ducula oceanica* including ssp. *ratakensis*.	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: *Pisonia grandis* and *Neisosperma oppositifolium* forests	*kañal (Pisonia) kōjbar (Neisosperma)*	Description: These forest types, now rare on Pacific atolls, was once widespread and is now found only where traditional *mo* prohibitions have prevented damage or clearance. Importance: rarity, preferred habitat for the nesting of certain birds, usually associated with *mo.*	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	*joñ, bulabol* and *kimeme*	Description: 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 *joñ (Bruguiera gymnorrhiza), bulabol (Sonneratia alba)* and *kimeme (Lumnitzera littorea)*. Importance: They are locally important as fisheries habitat, dye, canoe building and traditional garlands.	90%	-	
Pemphis acidula forest	*kōñe*	Description: 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. Importance: erosion control, rarity, wood source for firewood and building.	100%	50%	Large specimens of *Pemphis acidula* should all be protected

Target	Marshallese name	Description & Importance for conservation	Type I Goal	Type II Goal	Special issues
Pond	*pat*	Description: 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. Importance: 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		Description: Species of low stature (*Boehavia spp., Portulaca* spp.*, Sida fallax, Lepturus repens, Cyperus* spp. etc.) – primarily on northern atolls. Importance: important unique habitat, seabirds nesting habitat, includes endemic grass species on Bokak *(Lepturus gasparricensis).*	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		Description: Nesting beaches for green sea turtle *(Chelonia mydas)* and hawksbill turtle *(Eretmochelys imbricate).* Importance: 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	*jāñar*	Description: A mixed forest of windward shores. Typically contains the species *Scaevola, Tournefortia,* wild *Pandanus, Guettarda, Suriana* (northern atolls). *Scaevola taccada i*s often the most seaward and its labyrinth like drooping branches can effectively dissipate wave action. Importance: 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 *Pandanus.*	100%	-	Important to maintain the function of this forest for coastal protection.
Marine					
Clam site		Description: Areas with an unusual abundance of *Tridacna* spp. and/or *Hippopus hippopus* clams. Importance: as source population for surrounding areas.	50%	30%	Non-actively farmed sites protected as source for surrounding areas.
Fish spawning aggregation area (SPAG)		Description: Places where fish of a species occasionally aggregate to spawn. Importance: 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	*bōke*	Description: 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. Importance: fish aggregation sites, high biodiversity.	30%	-	
Reef hole	*nam*	Description: A deep biodiversity rich body of salt water partly or completely surrounded by reefs. Best area for night fishing for reef fishes and turtles. Importance: traditional and biological value.	30%	-	Protect from blasting/ dredging for boat channels.
Seagrass meadow		Description: Area with seagrasses, usually in the lagoon. *Thalassia hemprichii, Cymodocea rotundata* and *Halophila minor* have been recorded. Importance: 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.
Traditional Special Areas					
Traditional reserve	*mo*	Description: Areas subject to a traditional chiefly taboo. Importance: 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 *mo* 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	*bwebwenato*	Description: 1. Areas and/or features associated with legends (*bwebwenato*); 2. Areas where traditional medicine is cultivated, harvested and/or administered; 3. graveyards (*wuliej lap*, for chiefs). Other sites? Importance: 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	*lōb*	Description: Shallow body of water being partially bordered by an exposed coral reef during low tide. Much smaller and shallower than a Nam. Importance: traditional and biological value.	-	-	need to check if there is any traditional management
	kolla	Description: Shallow corals spots in the lagoon where turtles use for resting and sleeping at noon. Best hunting area for turtles. Importance: traditional and biological value			
	wōd in ekonak	Description: Certain lagoon pinnacles designated for fishing rainbow runners using traditional methods to catch the fish. Rich also with Tridacna giant clams. Importance: 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
Terrestrial		
Aquatic shrimp		Several species/ variants found in wetlands on Jaluit - possibly endemic to a single island or marsh area.
Arno skink		*Emoia arnoensis arnoensis.* Endemic / restricted range (endemic to Micronesia).
Horticultural species	*bōb (Pandanus tectorius* clones*), iaraj (taro)*	A number of varieties of *Pandanus tectorius (bōb)* are part of the Marshallese biodiversity heritage, many being endemic clones which were aboriginally developed. They cannot be maintained through seed but only though cuttings, hence are at risk of dying out. The giant swamp taro *(iaraj) (Cyrtosperma chamissonis)* is one of the most important traditional stabile but is falling into disuse through the westernization of foodstuffs.
Land crabs	*atuñ, baru wan, barulep*	Three species are harvested; a *Cardisoma* species *(atuñ), Geographus crinipes (baru wan)* and the coconut crab*, Birgus latro (barulep).*
Avifauna		
Bristle-thighed curlew	*kuk-kuk/ kewak*	*Numenius tahitiensis:* Vulnerable-IUCN.
Great Frigatebird	*toulōñ (f), ak (m)*	*Fregata minor:* of cultural importance to Marshallese.
Micronesian pigeon (including the Ratak subspecies)	*mule*	*Ducula oceanica:* Near Threatened - IUCN. and *D. oceanica ratakensis:* Endangered species RMI law, Species of Concern, USFWS, Restricted range known only in eastern Micronesia.
Short-eared owl		*Asio flammeus:* the whole species is IUCN (BirdLife International) Lower Risk/least concern; if it is the subspecies *ponapensis,* it would be regionally endemic and considered to be Candidate for Listing by the USFWS.
Short-tailed albatross		*Phoebastria albatrus:* Vulnerable-IUCN.
Marine		
Bigeye tuna	*bwebwe*	*Thunnus obesus:* Vulnerable IUCN
Black-lipped pearl oyster	*di*	*Pinctada margaritfera* Commercially important to RMI black pearl industry. (currently has a closed season under MIMRA Act MIRC Title 51 Para 217)
Bumphead parrotfish	*mem*	*Bolbometopon muricatum:* 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 - *Stenella attenuata* (and subspecies/ forms); Long-snouted spinner dolphin - *S. longirostris* (and subspecies/ forms); Common dolphin - *Delphinus delphis;* Striped dolphin - *S. coeruleoalba.* 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	*libuke*	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?

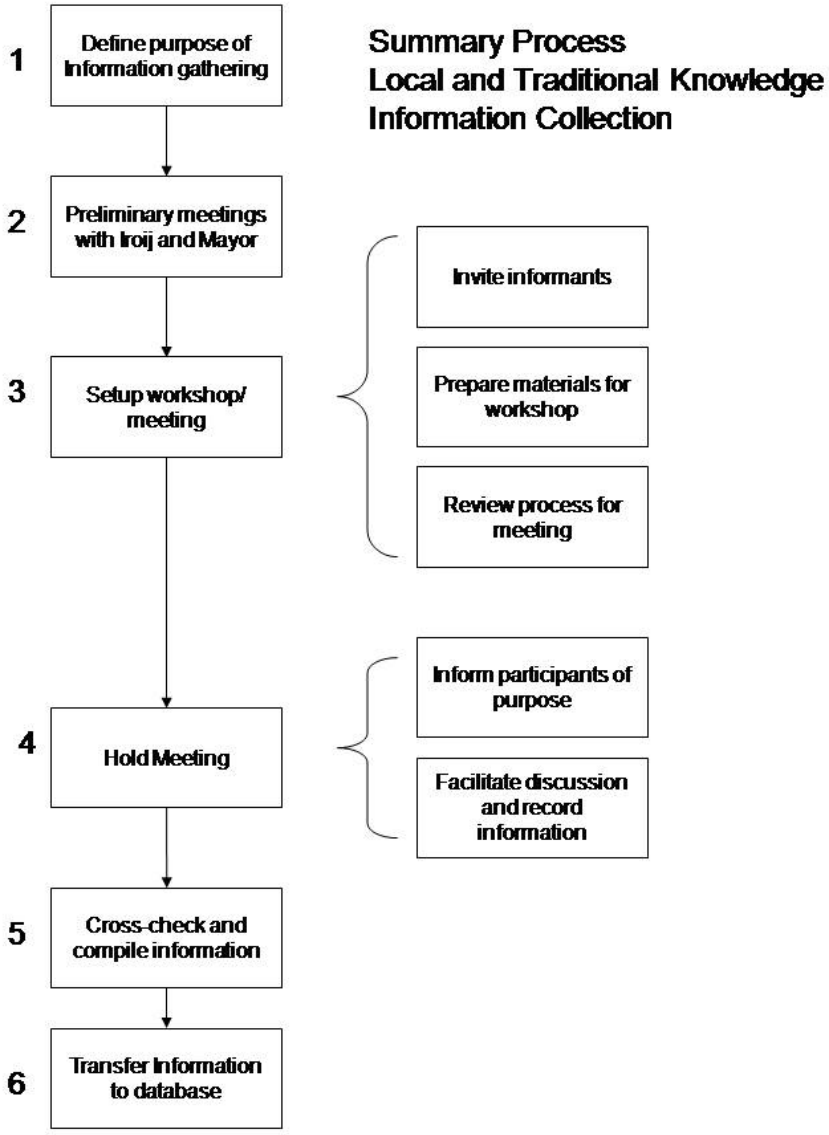
Target	Marshallese Name	Conservation significance
Game fishes		Marlin, Mahi mahi, wahoo, tuna etc. Migratory species. Important for tourism and sportfishing. (Currently protected under the MIRC Title 33 Ch.3 within a radius of Majuro and Kwajalein)
Giant clams		*Tridacna gigas (kabwōr):* Vulnerable-IUCN,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

Notes:
Status of species according to the IUCN Red List: IUCN 2006. 2006 IUCN Red List of Threatened Species. <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**
    - *Open questions* to invite detailed responses
    - *Closed questions* to confirm
    - 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.

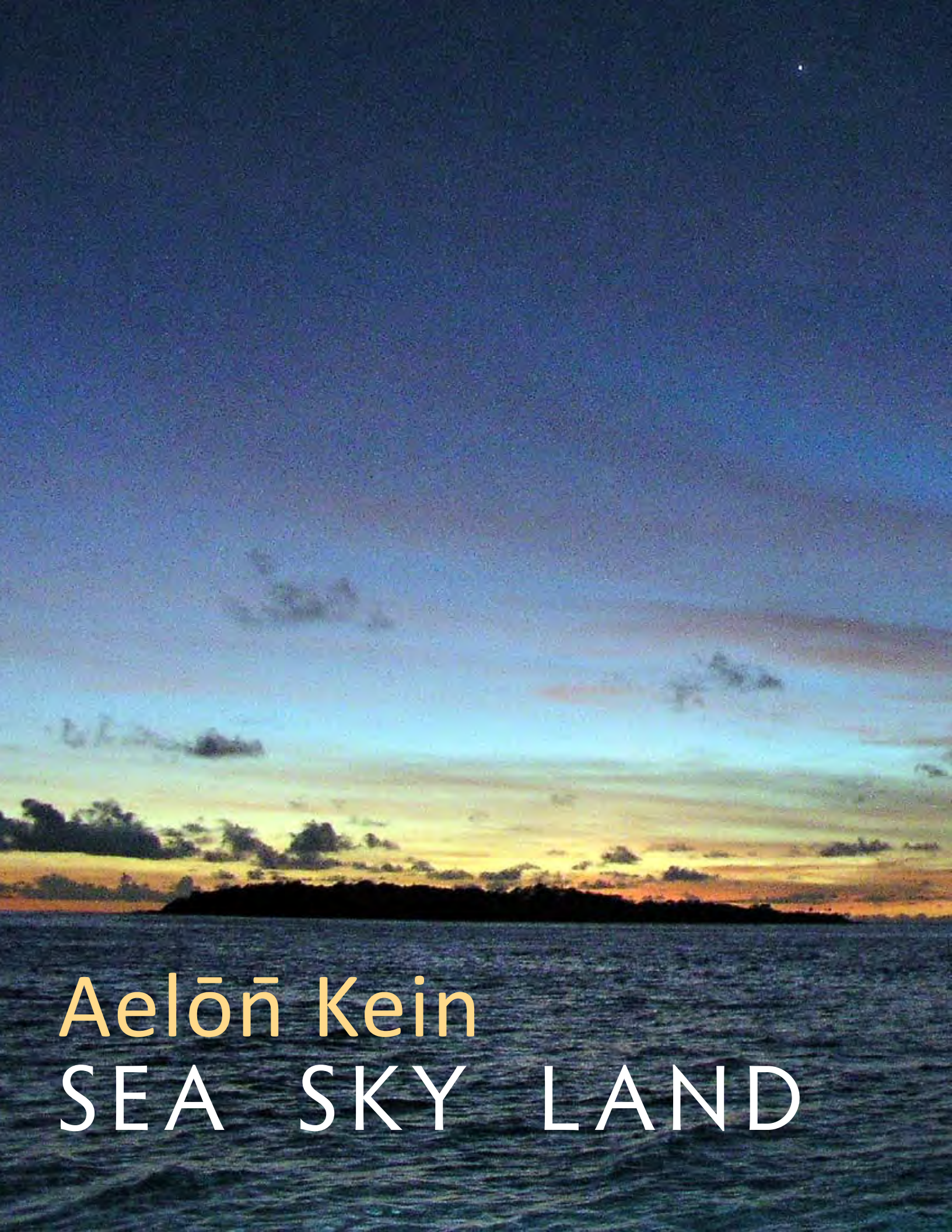
Special/ sacred places, mo (taboo)

- 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.


Aelōn̄ Kein
SEA SKY LAND

Republic of the Marshall Islands

Ministry of Resources and Development

Strategy and Action Plan
2005-2010

[Foreword from the Minister and/or Secretary needs to be inserted here]

Table of Contents

Abbreviations Used

ADB	Asian Development Bank
AG	Office of the Attorney General (RMI)
APCC	Asia Pacific Coconut Community
CMI	College of the Marshall Islands
DSAP	Development of Sustainable Agriculture in the Pacific (SPC)
RMIEPA	Environment Protection Authority (RMI)
EPPSO	Office of Economics, Policy, Planning and Statistics (RMI)
EU	European Union
FAO	United Nations Food and Agriculture Organization
FIAS	Foreign Investment Advisory Service (Australia)
HACCP	Hazard Analysis Critical Control Points
IA	Ministry of Internal Affairs (RMI)
JEMFAC	Joint Economic Management and Fiscal Administration Committee
KALGov	Kwajalein Atoll Local Government
MEC	Marshalls Energy Company
MIDA	Marshall Islands Development Authority
MIDB	Marshall Islands Development Bank
MIMRA	Marshall Islands Marine Resources Authority
MIVA	Marshall Islands Visitors Authority
OEPPC	Office of Environmental Policy and Planning Coordination (RMI)
PIC	Pacific Islands Center
PISBDCN	Pacific Islands Small Business Development Center Network
PITIC	Pacific Islands Trade and Investment Commission
R&D	Ministry of Resources and Development (RMI)
RMI	Republic of the Marshall Islands
SBA	Small Business Administration (US)
SBDC	Small Business Development Center (RMI)
SOPAC	South Pacific Applied Geoscience Commission
SPC	Secretariat of the Pacific Communities
SSC	South South Cooperation (FAO)
T&C	Ministry of Transport and Communications (RMI)
UH	University of Hawaii
UNDP	United Nations Development Program
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNIDO	United Nations Industrial Development Organization
USAKA	United States Army Kwajalein Atoll
USDA	United States Department of Agriculture
WAM	Waan Aelon in Majol
WTO	World Trade Organization
WUTMI	Women United Together in the Marshall Islands

Who We Are

Our Mission

As the primary government organization responsible for Agriculture, Energy, Trade and Investment in the Marshall Islands, the Ministry of Resources and Development will promote and assist the development of these sectors in a sustainable and productive manner, through activities which foster sustainable food production, provide alternative energy resources and income-generating opportunities for the people of the Marshall Islands. Respect for the environment will be a top priority and special focus will be given to the outer-island communities in developing their agricultural, energy and economic sectors.

Our Vision

We envision a future where:

- Modern development and urbanization co-exists with the environment and our traditional lifestyles ;
- Physically active people eat locally grown and processed, healthy foods and we have secure supplies of food;
- There are business and job opportunities for our people;
- Each outer-island household has access to electricity;
- Our beautiful islands are safeguarded from pests and disease;
- Our unique Marshallese products are being successfully exported around the world; and
- Our traditions are alive, and we are economically self-reliant.

Our Core Values

Team-work and Cooperation

We happily work together towards common goals, through talking to each other, sharing ideas, listening, and by doing the tasks that we need to do.

Trust

When a supervisor gives a staff member a task to do, there is trust in that delegation. At the same time, the staff member does what is expected in order to retain that trust.

"Honesty is the Best Policy"

We commit to do our tasks and we try our best to complete these tasks. However, when we encounter a problem or delay, or when we make mistakes, we ask for help.

Communication and Sharing Information

We have regular meetings and regularly report on our activities to all parts of the organization. We are engaged in questioning and listening to others, because by sharing information we will achieve our goals.

Organized

We work together towards the common goals we have developed through planning. To help us do this effectively we have detailed work plans with clear schedules and responsibilities and regular reporting. We have good collaboration through meetings and written plans, and responsibilities are made clear in our organizational structure and job descriptions.

Respect and Leadership

We are all leaders at one time or another. We show respect to ourselves and others by being on time, getting our tasks done and by being role models. We give praise and encouragement to recognize the efforts of others by saying "Good job" or "Thank you," but also give constructive feedback to help each other to improve. This type of encouragement and feedback occurs from supervisor to staff, between colleagues and from staff to supervisor.

"Nobody is perfect… we are all learning!"

Background and Context of the Ministry of R&D

History:

The Ministry of Resources and Development was established in 1979 under the Constitution of the Marshall Islands. The portfolio of the Ministry has undergone several changes during its history. Primarily responsible for development of the economy through promoting agriculture, investment and trade and energy development, the Ministry has also been responsible for fisheries, tourism and public works in the past. In 1997 The Marshall Islands Marine Resources Authority was established by an Act and mandated with the management of all marine resources in the RMI. In 1997 The Marshall Islands Visitors Authority was created to focus on development of the tourism industry in the Marshalls. While these remain the two greatest opportunities for economic development and export, the sectors within the Ministry remain critical for economic development of the young nation of the Marshall Islands. In 1997 through the ADB-led public sector reform program, the Ministry of Public Works was incorporated into the Ministry of R&D. It was subsequently separated out again in 2000.

Lands and survey, planning and zoning functions and labor functions were also part of the Ministry in the past. The Ministry has evolved over the years to its current set of responsibilities.

Legislative Framework:

There are several key pieces of legislation relating to the Ministry of Resources and Development.

The following references have all been taken from the Marshall Islands Revised Code, 2004 Edition.

Title 8, Chapter 1: Quarantine Restrictions - "Animal and Plant Inspection Act" requires the Chief of Agriculture (within the Ministry of R&D) to issue regulations pertaining to quarantine, and to monitor and enforce those regulations and the Act. This describes the core function of the Animal and Plant Protection Unit within the Ministry. Quarantine Regulations exist subsidiary to this law.

Title 8, Chapter 2: "Export Meat Inspection Act" requires the Chief of Agriculture to inspect all meat for export.

Title 8, Chapter 3: "Endangered Species Act" requires the Secretary of Resources and Development to promulgate, monitor and enforce regulations regarding endangered species in the RMI. Again, no such regulations are in existence. Consideration should be given to coordinating with other agencies, in particular the Environment Protection Authority to amend and/or implement the Act as required. The implementation of this act is critical to the conservation of the Marshall Islands' biodiversity.

Title 35, Chapter 3: "Alternative Energy Fund Act of 1989" provides for a revolving fund for the development, marketing and operation of alternative energy systems, and as such is to be utilized by the Energy Services unit of the Ministry (although the fund itself is administered by the Ministry of Finance).

Title 11, Chapter 14: "Agricultural Supplies Account Act 1979" provides for a fund for the purchase of Agricultural supplies, to be administered by the Minister and Ministry of Resources and Development.

Many other business related laws are relevant to the Ministry, in that the Ministry provides guidance to investors on how to comply with those laws. The staff in the Ministry needs to become familiar with the relevant business and investment-related laws and regulations.

Current Situation

Physical Infrastructure

Facilities: The Ministry of R&D works out of four facilities in Majuro, one in Ebeye and one in Arno.

On Majuro, most of the divisions are located in a building shared with MIMRA in Delap. The Small Business Development Center offices are located at the Marshall Islands Development Bank (MIDB) building.

The Quarantine division has an office on Ebeye located on the 1st floor of the Kwajalein Atoll Local Government (KALGOV) building.

R&D has two extension/demonstration facilities in Laura Village on Majuro; both are managed through a technical assistance program funded by the Republic of China (Taiwan).

Office Space: There appears to be adequate office space for all of the staff at R&D. The staff has expressed interest in establishing an information center and library to house all R&D materials. These would be accessible to R&D staff and to the general public.

Transport: The Ministry has four double cab trucks and one car which is used exclusively by the Quarantine division.

The Ministry formerly owned an inter island landing craft. It was transferred to the Ministry of Transportation & Communications two years ago. The lack of access to an inter island vessel such as the landing craft has made it more difficult to move equipment such as agricultural tools, and has had a negative impact on outer island outreach programs.

Heavy Equipment: The Agriculture Services division has in its possession various heavy equipment, including a tractor and backhoe loader. It also has shredding equipment and other types of equipment. Most of the equipment is located at the main R&D compound in Delap.

Lab Equipment: The Agriculture Services division has lab equipment, but all of it is in storage or has been given to the CMI/ LandGrant program at Arrak. Today, R&D collaborates with CMI LandGrant and relies on their research.

Information Technology: There is a computer network in the main offices in Delap, but not everyone has access to the network and it is slow and in need of an upgrade. The network is hooked up to the internet. Almost all of the offices have a desktop computer. However, reports, announcements and so forth are not always posted on the network.

Financial Resources

Budget Summary:

The bulk of the Ministry's total budget comes from international agencies. The Ministry receives:

$645,842 From the RMI General Fund for use across the range of programs;

$141,362 From the Compact fund for private sector development;

$326,147 From UN FAO for Food Security, South South Cooperation (technical assistance) and other special projects such as the Banana project;

$41,000 From US Federal Grants; and

$50,000 annually for SPC Development of Sustainable Agriculture in the Pacific (DSAP).

The Ministry also administers grants from the EU for implementing energy policy.

These numbers are dictated by fiscal year budgets and are subject to change on an annual basis.

Human Resources

Quantitative:

The Ministry employs about 26 staff; 13 in Agriculture and Quarantine Services, 5 in Trade, Investment and Business Services, 2 in Energy Services and 6 in Management and Administration.

Capacity Building Needs:

There needs to be a strategic approach to Human Resource Development and Capacity-building within the Ministry. In the future, it will be important to have degree-qualified people working in the technical areas of Agriculture, Trade and Investment and in Energy.

Professional needs:

- Agriculturists;
- Economist / International Trade/ Business Management;
- Public Policy and Planning;
- Human Resource Management; and
- Access to highly specialized professions such as entomologists and veterinarians.

Additionally, because of the Ministry's key role in intermediary capacity building, there will need to be professional level people in Agriculture Extension who are well-versed in participatory techniques.

In response to the ongoing needs for Capacity Building and Human Resource Development, the Ministry has developed a Strategic Program to address Human Resource Issues in a consistent manner, with an eye on recruiting and retaining a higher level of skill and competence. See *Program E1: Human Resource Management.*

Core Processes

Service Provider: The Ministry describes itself as a Service Provider, primarily delivering services of *Facilitation* and *Information*. In order to emphasize the role of service to the community and the people of the Marshall Islands, the Ministry has named the most relevant programs as "Services."

Facilitator: The Ministry describes its role as a Facilitator as:

We "listen" to the needs and wants of our key stakeholders and target groups

Through meetings, consultation, surveys and observation,

We process this information

And respond by

Organizing, planning, and acting as the liaison between stakeholders.

Information Manager: The Ministry describes its role as an Information Manager as the following:

We collect, manage and disseminate relevant information

To enable the Ministry and our customers and stakeholders to make informed decisions.

Information is collected and stored in hard copy or electronic form,

Is processed to make it more meaningful, through translation or publication,

And then disseminated to our customers and stakeholders through a variety of mechanisms.

Key Customers

Farmers:

Several programs need to focus on providing services to farmers with an emphasis on development of skills in agriculture and in basic business planning and marketing of produce- including identifying what types of crops to grow, post-harvest handling and food safety. Another major issue is providing this customer group with access to credit for tools, seeds etc. All programs will rely heavily on the Agriculture Extension trips, leveraging these Outer-island visits to provide a broader range of services.

Special Program: Farmers' Markets

A1: Agriculture Production Services

C1: Microfinance

C2: SBDC

Outer-Island Communities:

A focus of the Ministry's mission is the development of Outer-island communities. The distances and difficulties of accessing the Outer Islands means that R&D will have to prioritize islands for development and for Extension activities. All programs will rely heavily on the Agriculture Extension trips, leveraging these Outer Island visits to provide a broader range of services.

A challenge for R&D will be to extend the range of services to Outer-island communities.

Special Program: Coconut "Tree of Life"

A1: Agriculture Production Services

B1: Product Development Services

C1: Microfinance

C2: SBDC

D1: Outer Island Electrification

Business Community and Investors:

Private sector development is one of the most important development strategies of the RMI government. The Ministry provides a range of services to potential and established businesses and investors, including:

- Information and guidelines on establishing a business and investing in the RMI;
- Contact information;
- Assistance in business planning for small businesses;
- Export facilitation (assisting businesses to meet export requirements);
- Facilitation of access to domestic and international markets; and
- Assistance in product development.

B1: Product Development Services

B2: Domestic Marketing Services

B3: International Marketing Services

B4: Trade Facilitation Services

C2: Small to Medium Business Services

C3: Investment Information and Facilitation Services

There are many other stakeholders and customers for the Ministry, however, the groups listed above remain the *primary focus* of Ministry service delivery.

Policy and Planning Committees

Resources and Development Task Force

Over the years, as statutory authorities were established for the important industries of tourism and fisheries, these agencies split away along with the functions of planning for economic development. The Resource and Development Task Force was established in 2000 in order to provide a forum for the coordination and sharing of economic development plans and policies. The R&D Task Force has been dormant and the Ministry intends to revive the Task Force to improve planning coordination. Key members of the Task Force are the *Marshall Islands Visitors Authority (MIVA), Marshall Islands Marine Resources Authority (MIMRA), the Economics, Policy, Planning and Statistics Office (EPPSO), the Marshall Islands Development Bank (MIDB) and Tobolar.*

Food and Nutrition Task Force

The Food and Nutrition Task Force is a multi-agency committee that was established in 1996 with a basic mandate to decrease the incidence of lifestyle diseases in the RMI and increase the consumption of local foods of higher nutritional value. In that year, the task force developed and approved the "RMI Food and Nutrition Policies." Since 2000, however, the task force has been dormant. The Ministry intends to revive the committee, consisting of representatives from the *Ministries of Health and Education, MIMRA, the Environment Protection Authority (RMIEPA) and the private sector* to provide guidance and policy direction on a range of issues including:

- Promoting healthy eating and Marshallese produce;
- Codex Alimentarius compliance and food safety;
- Health of imported goods (for example, turkey tails);
- Providing input on the activities of the SPC Development of Sustainable Agriculture in the Pacific and the FAO Food Security programs; and
- Other activities regarding food and nutrition where stakeholder input is required.

Program Overview Table

Special Programs

1: Coconut "Tree of Life" (Outcome 1)

2: Farmers' Markets (Outcome 2)

Program Area A	Program Area B	Program Area C	Program Area D
(Outcome 1)	**(Outcome 2)**	**(Outcome 3)**	**(Outcome 4)**
Primary Production Agriculture	**Product and Market Development**	**Investment and Business Development**	**Energy Services**
A1: Agriculture Production Services	B1: Product Development Services	C1: Micro-finance Services	D1: Outer Island Electrification
A2: Plant and Animal Protection Services	B2: Domestic Marketing Services	C2: Small to Medium Business Services (SBDC)	D2: Other Energy Services
A3: Agriculture Policy and Planning	B3: International Marketing Services	C3: Investment Information and Facilitation Services	
	B4: Trade Facilitation Services	C4:Trade and Investment Policy	

Program Area E : (Outcome 5)
Management and Administration

E1: Human Resource Management

E2: Planning, Measurement and Reporting

E3: Information Management

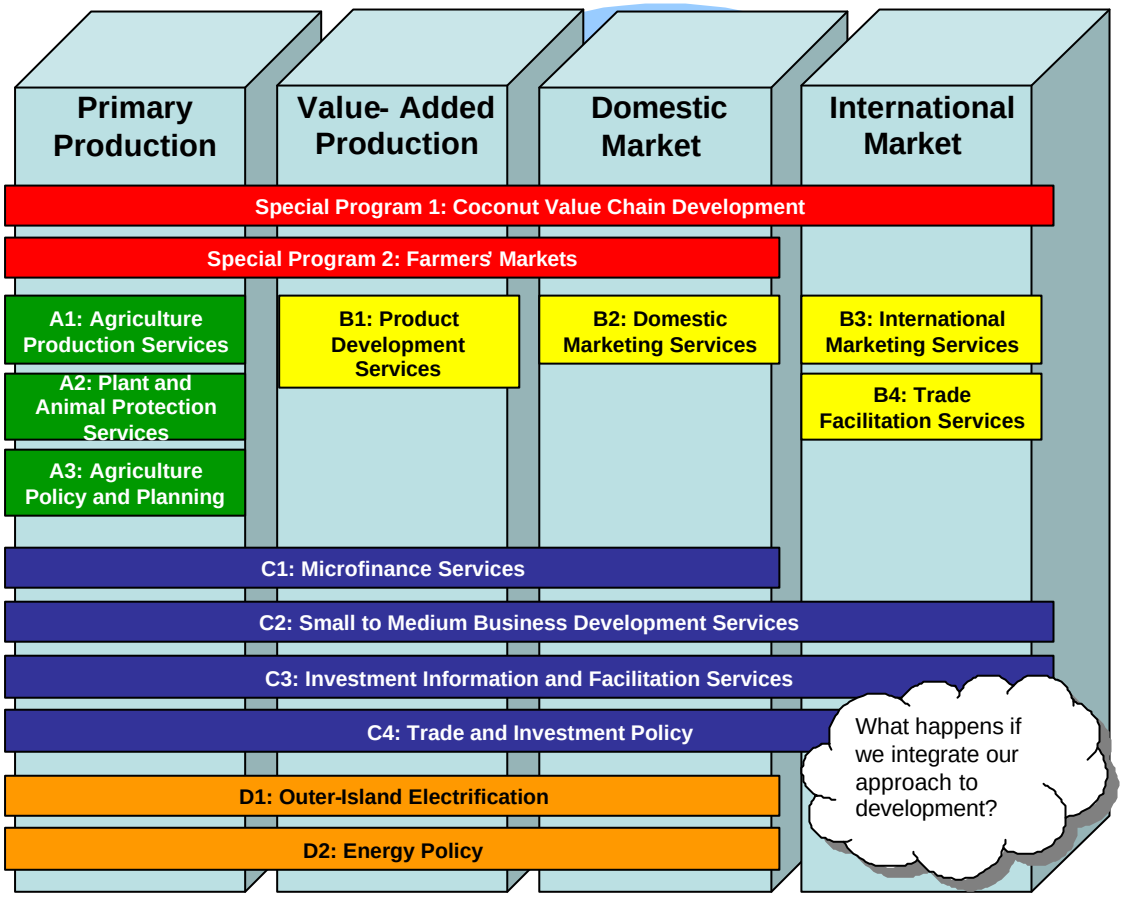
An Approach to Resource Development- the Value Chain

The Ministry of Resources and Development has taken a strategic approach to consider the questions…

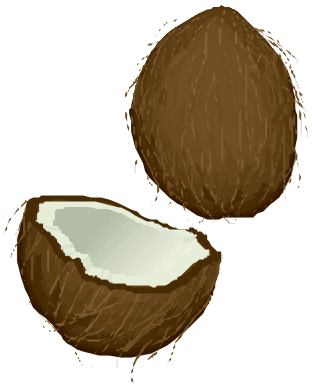
What are the ***Resources*** of the Marshall Islands?

What are the opportunities for the ***Development*** of these resources?

As a result of this, the Ministry has used a "Value Chain" model looking at primary production, value-added production and market development for products. The diagram below indicates how R&D's programs support the development of the resource value chain.



Special Programs



Special Programs are programs to be implemented by the Ministry of Resources and Development, which are broad in scope and cut across not only the departments within the Ministry, but will also require committed involvement from a range of other stakeholders. We think these are projects that have the potential to create sustainable change and real economic development and are worthy of our special focus. With our limited resources, these are the areas in which we are optimistic that we can make a difference.

"Farmers Markets" on Majuro and Ebeye

Coconut "Tree of Life" Development

Special Program: "Farmers Markets" on Majuro and Ebeye

Objectives

Established Farmers' Markets in the urban centers of Majuro and Ebeye to encourage production and sale of locally grown and processed food and goods.

Measures

- ✓ Markets are established;
- ✓ Number of producers participating in the market;
- ✓ Number of consumers participating in the market; and
- ✓ Value of goods exchanged in the market.

Background

A "farmers' market" is a place where local people can come together and sell their local produce - fruit and vegetables, and also fresh fish and locally processed foods such as preserved Pandanus, roasted breadfruit and fish jerky. It can also be a place to sell handicrafts or clothes. For the consumers in the local community, the market will be a place to buy local, fresh and healthy foods, and would serve as a gathering and meeting place.

Creating such markets will help achieve several development objectives for the Marshall Islands, including import replacement, healthier diets, increased self-reliance and income-generating opportunities for the community.

Previous attempts have been made to establish such a market. A building was established several years ago near the Ministry building but was subsequently appropriated for other uses. The Ministry of R&D has highlighted this "Farmers' Market " program as a special focus area. Its cross-cutting nature requires that resources be allocated from various departments in the Ministry, and also requires that the Ministry work in close cooperation with Farmers' Associations, Local Governments and the private sector to establish a sustainable activity.

Strategies

- Facilitate the establishment of a fixed location for the market, with access to shelter, tables, water for cleaning and administration of market fees;
- Encourage private sector involvement in the market in terms of ownership or management;
- Facilitate the participation of existing and new local producers;
- Facilitate access to transport and local agents for outer-islands producers to sell their produce or goods at the market;
- Cooperate with MIMRA to include sale of fish at the market; and
- Ensure post-harvest handling is done in accordance with food safety principles.

Key Stakeholders and Partners

Farmers, manufacturers, producers
Laura Farmers Association
Handicrafts Association
MIMRA
Majuro and Kwajalein Local Governments
Private sector investors, owners and/or managers

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Carry out research to understand why the previous attempt at a market did not work	MalGov MIMRA	Yr 1 Q1	Trade Promotion Officer	Report describing "Lessons Learned" and recommendations
	Develop a detailed work plan for facilitating a monthly farmers market on Majuro		Yr 1 Q1	Trade Promotion Officer Chief, Agriculture	Detailed work plan with commitment
	Facilitate a monthly farmers market on Majuro until permanent market can be established	MalGov Laura Farmers' Asn.	Yr 1 Q1	Trade Promotion Officer Chief, Agriculture	Monthly farmers' market held
	Establish permanent Farmers' Market on Majuro		Yr 1 Q4	Deputy Secretary	Market established and held weekly
	Establish Farmers' Market on Ebeye		Yr 2 Q4	Deputy Secretary	Market established and held weekly or bi-weekly
	Encourage agricultural production on Majuro and select outer islands to supply farmers market	As part of Agriculture Production Services See Program A1.		Chief, Agriculture	Increased produce and goods being sold from outer islands
	Provide training to farmers in post-harvest handling	FAO/ SPC	Yr 1 Q4	Chief, Agriculture	# Farmers trained in post-harvest handling
	Advise farmers on which crops to grow		Yr 1 Q4	Trade Promotion Officer	
	Facilitate transport from outer islands to urban centers by negotiating with transport operators	Ministry of T&C Private operators	Yr 1 Ongoing	Deputy Secretary	# of visits of merchant/ supply boats to each outer island

Possible Issues/ Constraints

This program requires cooperation and coordination with a range of stakeholders and will require engagement of a party (not the Ministry) to establish and manage permanent market sites.

Special Program: Coconut "Tree of Life" Development

Objectives

Increase the value of coconuts and coconut products to the Marshall Islands.

Reduce dependence of outer islands on imported fuel and copra subsidies.

Develop value-added coconut products for export.

Measures

- ✓ Increase in real value of coconuts and coconut products to the Marshall Islands (economic assessment);
- ✓ Increase in use of coconut products on-island;
- ✓ Increase in income or equivalent income for outer island communities (for example, if fuel costs are reduced, this can be considered equivalent income); and
- ✓ Decrease in subsidy payments from the government.

Background

Since the 1850's the Marshall Islands have been involved in Copra production, and the atolls are widely planted with coconut trees. This is one of the most underutilized resources and an integrated approach to the development of coconut resources in the RMI has the potential to have a positive impact on the living standards of outer islanders while reducing the reliance on government subsidies for copra.

The extraction of coconut oil can be decentralized and carried out on outer islands at relatively low cost. The oil can then be used to run electricity generators (at significantly lower cost than solar power), diesel vehicles and outboard motors. Electricity from the generator can be used to drive high-power machines such as refrigerators, irrigation pumps and power tools, thus opening up a range of income-generating opportunities. This is a particularly exciting possibility for Outer Island Electrification using a renewable energy source. (See *Program D1: Outer-Island Electrification*).

All of this provides opportunity to increase subsistence and surplus production of fisheries and agricultural products.

Coconut oil can also be used directly for cooking, or to develop value-added products such as beauty creams and oils.

While parts of the coconut tree are already used for handicrafts, there are other parts whose economic value can be explored, such as the timber from the large population of senile trees (at the end of their productive life), and high-quality, high-value charcoal production from the coconut shell.

The Ministry of R&D highlights the "Coconut Value Chain Development" as a high-priority program with the potential to have a real impact on the quality of life in the outer islands. It is a cross-cutting program which requires allocation of resources from all departments in the Ministry; Agriculture, Trade and Business Development and Energy, as well as strong partnerships with many other stakeholders.

Strategies	▪ Establishment of a Multi-Agency Project Team; ▪ Rehabilitation and replanting of coconut trees; ▪ Value-added production and use of coconut products on outer islands, therefore reducing costs and losses from inter-island transport; ▪ Refocus the coconut industry from copra-export to value added products and local use in fuel, cooking oil, livestock feed, and other uses; ▪ Complete assessment of economic value chain to pinpoint development areas of focus; ▪ Facilitation of access to small-scale processing equipment and access to credit for purchase of equipment; ▪ Examination of different value-added products for export potential; and ▪ Focus on development of coconut value-chain on outer islands.
Key Stakeholders and Partners	All divisions of R&D; Agriculture Services, Trade, Investment and Business Services and Energy Services Tobolar, PII SOPAC WAM (for possible uses of timber) FAO SPC APCC USDA Forestry Service

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Establish a "Coconut Value Chain" project team	As above	Yr 1 Q1	Secretary	Team established and Terms of Reference written
	Project plan developed		Yr 1 Q2	Secretary	Published project plan
	Collect and compile information on possible uses of coconut products and by-products		Yr 1 Q2	TBD	Information Compiled and made available
	Carry out economic assessment of possible uses of coconut in the Marshalls		Yr 1 Q2	TBD	Economic assessment published
	Select outer islands for pilot project		Yr 1 Q2	Secretary	Outer islands selected
	Establish replanting and rehabilitation program		Yr 1 Q2	Chief, Agriculture	Plan developed and revised based on coconut census data (below)
	Coconut tree census	CMI/ LandGrant	Y1 Q2	Chief, Agriculture	Data showing quantity and ages (relative productivity) of coconut trees across the RMI

Note: This outline of activities, and their timing and responsibility may change substantially based on the project design, however, the project team should include theses activities as a minimum guide to what needs to be achieved.

This program is strongly linked to *Program D1: Outer-Island Electrification*.

Possible Issues/ Constraints

These activities require cooperation and coordination of a range of stakeholders and will also require strong political support to maintain the focus.

Program Area A: Agriculture

A1: Agriculture Production Services

A2: Plant and Animal Protection Services

A3: Agriculture Policy and Planning

Program A1: Agriculture Production Services

Objectives	Increase domestic food production. Ensure adequate production of raw materials for handicrafts, medicine, coconut products and other non-food production.
Measures	✓ Increase in agricultural production across the Marshall Islands ; and ✓ Corresponding decrease in consumption of imported goods .
Background	Agriculture Production Services essentially provides extension support for agriculture in the RMI. Of key relevance here is the Agriculture Sector Development Strategy and Action Plan for the RMI, developed with assistance from the ADB in 1997. This document outlines particular approaches to developing agriculture for the RMI and should be referred to while developing detailed action plans from this 5-year plan.
Strategies	▪ Improving the technical skill of farmers through extension services including hands-on demonstrations, access to training courses and "how-to" publications; ▪ Increasing community participation in farming through demonstration plots, school gardens and by demonstrating the income generating potential of farming; ▪ Increase the participation of women in farming; ▪ Implement sustainable farming systems ; ▪ Composting (link composting to business opportunity and solid waste management); ▪ Increased intensive production through integrating introduced crops to an existing farming system ; ▪ Promotion of livestock farming; ▪ Increase domestic/ local trade in agricultural products; ▪ Sustainable management of agro-forest resources, including replanting and rehabilitation, particularly of senile coconut trees; ▪ Focus on development of agriculture in outer islands ; and ▪ Establish and maintain nurseries for preservation of genetic resources and as a supply for farmers.
Key Stakeholders and Partners	FAO, SSC, SPC Farmers, NGOs, Women's Groups, Churches, Schools, Farmers' Associations .

Activity	Partners	Timing	Responsibility	Outputs/ Measures
Develop extension manual, including procedures for data collection	SPC-DSAP project	Yr 1Q4	Chief, Agriculture Services	Clear and effective extension manual
Develop plans for outer-island visits		Yr 1 Q2	Chief, Agriculture Services	Written plans for each outer-island visit
Recruit and train local counterpart on selected atolls	Local Government	Yr 1 and Ongoing	Chief, Agriculture Services	Counterparts recruited and trained
Carry out visits to outer islands		Yr 1 Q1 and Ongoing	Extension Agents	# of visits carried out and reports of activities produced
Nursery Program	USDA Forestry Service FAO SPC-DSAP		Chief, Agriculture Services	
Expand nursery on Majuro				# of species maintained # of plants distributed
Establish satellite nurseries on outer-islands		Ongoing		1 nursery established on each of the 5 target atolls # of plants in satellite nurseries
Establish Livestock Breeding Program	FAO/ SPC	Yr 3-5	Chief, Agriculture Services	TBD
Operate Demonstration Farms	TBD	TBD	Chief, Agriculture Services	TBD
Develop "micro-gardening" in urban centers through awareness programs and demonstrations		Yr 2 onwards	Chief, Agriculture Services	# of people with "micro-gardens"

Possible Issues/ Constraints

Low capacity in agriculture and extension in terms of skill;
Lack of inter-island transport by boat; and
Degree of commitment of local governments and communities.

Plans for outer-island visits will include:

- Which atoll and islands are to be visited, when, by who and the specific objectives of the visit.

Objectives will include:

- Developing a local on-island counterpart;
- Collecting information on agricultural activities and needs, soil samples etc;
- Providing hands on training, information and awareness in the areas of:
  - Crop production
  - Agroforestry
  - Livestock production
  - Pest and Disease control
- Providing information about other services offered by R&D especially:
  - Business planning and training
  - Facilitating access to credit
  - Product development services
  - Energy/ electrification services.

Program A2: Plant and Animal Protection Services

Objectives	Prevent the introduction and further spread of injurious pests and diseases into and within the Marshall Islands. Safeguard agriculture, livestock and the Marshalls' natural biodiversity.
Measures	✓ Incidence of injurious pests and diseases in the Marshall Islands (from survey).
Background	The activities in Plant and Animal Protection Services are critical to the ongoing health of the Marshalls' extraordinary natural biodiversity and agricultural activities, as well as current and future export and trade activities. Plant and Animal Protection Services carry out quarantine inspections and law enforcement on all incoming aircraft and vessels to the Marshall Islands. In addition, the division will conduct surveys and monitoring of pests. It is essential that the Ministry of R&D maintains an internationally acceptable level and quality of activity.
Strategies	▪ Inspections according to regulations; ▪ Eradication and control programs; ▪ Public education and awareness to comply with quarantine laws: – Increase awareness of bringing in pests and disease from overseas; – Increase awareness on the spread of pests and disease between islands; – Provide information on eradication and control procedures; ▪ Monitoring and surveillance of fruit flies, mealy bug, coconut scale; ▪ Capacity-building; improve the identification of species the quarantine officers do not know; and ▪ Develop response plans.
Key Stakeholders and Partners	SPC Plant Protection Micronesia Project FAO Pest Net RMI Ports Authority Airlines Importers and Exporters Ministry of Health Environment Protection Authority Community

Activity	Partners	Timing	Responsibility	Outputs/ Measures
Review quarantine manual	SPC	Yr 1 Q4	Head Quarantine Officer	Updated quarantine manual
Review quarantine regulations	AG	Yr 1 Q4	Head Quarantine Officer	Updated quarantine regulations
Develop response plans for pest and disease outbreaks	Chief Secretary's Office, Ministry of Health, Ports Authority, RMIEPA, SPC	Yr 2	Head Quarantine Officer	Mitigation plans in place
Carry out enforcement of quarantine law (Ports inspections on Majuro and Kwajalein)		Ongoing	Quarantine Officers	# and type of inspections # and type of confiscations
Carry out extension activities - show people how to identify and eradicate pests and disease	R&D Extension Officers	Ongoing	Head Quarantine Officer	#, type and location of extension activities
Produce and maintain brochures for public awareness	SPC	Ongoing	Head Quarantine Officer	# of brochures distributed
Public Awareness campaign on quarantine and pests		Ongoing	Head Quarantine Officer	# of radio announcements, pamphlets, conferences etc.
Regular surveillance and monitoring (*esp. fruit flies, mealy bug and coconut scale*)	SPC	Ongoing	Head Quarantine Officer	Frequency and type of surveys Results of surveys
Identification of previously unknown species	CMI LandGrant, SPC, FAO PestNet	Ongoing	Head Quarantine Officer	# of species identified
Carry out control/ eradication activities - Scheduled and Responsive		Ongoing (Scheduled Quarterly)	Head Quarantine Officer	# and type of scheduled/ responsive control activities Measure effectiveness through results of surveys
Respond to requirements of Cartagena Protocol as required	OEPPC	As needed	Secretary	Regulations and manual updated to reflect compliance
Establish an animal health/ para-veterinary service		Yr 3	Secretary	Service established
Develop a coordinated approach to plant and animal protection with USAKA (includes quarantine inspections on incoming military planes and vessels, control and eradication, incineration of confiscated goods etc.)	USAKA	Yr 1 Q4	Secretary	Agreement made between RMI Government and USAKA on quarantine of military vessels

Possible Issues/ Constraints

Difficulty in accessing convenient transport for quarantine officers between Ebeye and Kwajalein for ports inspections.

Program A3: Agriculture Policy and Planning

Objectives	Develop policy and plans for the effective development of agriculture in the Marshall Islands.
Measures	✓ Agriculture development plan for RMI produced; ✓ Atoll-based development plans produced; ✓ Agricultural information available; and ✓ Long-term: Socio-economic impact on the population of the RMI.
Background	An agriculture policy was developed in 1996 with the assistance of the Asian Development Bank. There is a need to develop capacity for agriculture planning, and to develop plans that are based on information. This program focuses on gathering information, developing national and local agriculture plans and ensuring that the institutional framework is conducive to agriculture development. There is also a need to improve work planning and data gathering within the agriculture division to increase the effectiveness of the Ministry's activities in this area.
Strategies	▪ Improve agriculture information collection and management; ▪ Develop a national plan, and detailed plans for agriculture development on atolls based on the information; ▪ Build capacity in agriculture policy and planning; and ▪ Ensure legislation and government policy is conducive to the development of agriculture.
Key Stakeholders and Partners	FAO SPC EPPSO Lands and Survey (Ministry of Internal Affairs), MEC

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Conduct agriculture census	FAO Consultant	Yr 1 Q3	Chief, Agriculture Services	Completed report of results of agriculture census
	Create Agriculture Development Plan			Chief, Agriculture Services	
	National	FAO, SPC	Yr 2		National Agriculture Development Plan
	Atoll-based		As req'd		Atoll-specific agriculture development plans
	Establish GIS System for Agriculture Planning	SPC RMIEPA, MIMRA, Lands and Survey (IA), MEC	Yr 3	Chief, Agriculture Services	GIS System with agriculture information in place
	Collect and maintain agricultural information/ census information during extension activities	FAO, SPC	Yr 1 Q4	Chief, Agriculture Services	Data submitted from all outer-island visits
	Select 5 target atolls for each year		Yr 1 Q1 and annually	Secretary	5 atolls selected for focus each year
	Develop Agriculture Program for Majuro and Kwajalein		Yr 2	Chief, Agriculture Services	Written Plan for Agriculture on Majuro and Kwajalein
	Review government policy and legislation and make recommendations to facilitate agriculture development	FAO, SPC	As required	Secretary	Recommendations to cabinet/ revised legislation

Possible Issues/ Constraints

A major constraint is the current capacity for agriculture policy and planning within the Ministry.

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Program Area B: Product and Market Development

B1: Product Development Services

B2: Domestic Marketing Services

B3: International Marketing Services

B4: Trade Facilitation Services

Program B1: Product Development Services

Objectives

Improve quality and increase quantity of manufactured products;

Develop new products (Increase the number and type of manufactured products);

Ensure the safety of products especially products for consumption;

Ensure manufacturing of products for export meets all export requirements; and

Improve packaging and labeling to be more attractive, and to meet requirements of importing countries.

Measures

- ✓ Number of different local products available for local consumption; and
- ✓ Number of local products that meet export standards for quality and reliability.

Background

As part of an overall strategy to provide income-generating opportunities for the people of the Marshall Islands, the Ministry will provide support for the development of manufactured and processed products for local consumption and for export.

The efforts will be focused on providing training, workshops and other information to encourage the development of new products, and to improve the production of existing products, especially for cottage-scale operations.

Products to be developed may include handicrafts, processed foods such as preserved fish and pandanus, traditional medicine such as the Noni juice and other products made from local raw materials.

This program is one part of the Ministry's overall strategy to increase consumption of domestic products, thus decreasing dependence on imports and increasing the self-reliance of Marshallese families and communities.

Strategies

- Business development; encourage small and medium enterprises in manufacturing/ value-added production;
- Facilitate access to training in manufacturing technology, food production, product development, HACCP and packaging and labeling;
- Target training for small cottage-scale production;
- Have a food technologist/ HACCP expert in house;
- Identify local products that can replace imports for product development;
- Develop a showcase of Marshallese and Pacific Island Products;
- Ensure products meet labeling requirements of importing countries.

Key Stakeholders and Partners

Handicrafts Association
Noni Juice/ Arno Oil company
Tobolar
MIMRA
WAM
WUTMI
Farmers' Associations
FAO

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Identify specific business opportunities in manufacturing and feed into SBDC		Yr 1 Q1 Ongoing	Trade Promotion Officer	Descriptions of suggested business opportunities and basis for inclusion
	Identify quality and labeling requirements for importing countries and develop appropriate training material	FAO		Trade Promotion Officer	
	Identify specific types of products on which to focus development each year		Yr 1 Q1 & Annually	Trade Promotion Officer	List of product development focus each year
	Develop a list of specific training needs and identify local trainers, if available		Yr 1 Q1	Trade Promotion Officer	List of specific training needs
	Apply to regional or international agencies for assistance in training		Yr 1 Q2 Ongoing	Trade Promotion Officer	Written requests for assistance to appropriate agencies
	Schedule training sessions to coincide with conferences		Yr 1 Q4	Trade Promotion Officer	Schedule of training
	Advertise training sessions on radio, in paper and through meetings of interest groups		Yr 2	Trade Promotion Officer	Advertisements and brochures
	Organize and host training sessions		Yr 2	Trade Promotion Officer	# and type of training sessions annually # of people trained

Note: This program will leverage agriculture extension visits to outer islands as a way to disseminate information about services and training offered.

Possible Issues/ Constraints

Previous attempts to develop new products have tended to focus on too many products at one time. A lesson learned is to focus on a small number of product types and to develop skills in that area.

Local trainers are preferred, but are often not experienced in product development and high-quality presentation.

Program B2: Domestic Marketing Services

Objective	Increase domestic consumption of local products.
Measures	✓ Value of domestic products sold domestically.
Background	Development of a domestic market is essentially increasing the demand from domestic consumers for locally produced goods and services. The development of a domestic market for local products will help achieve several development objectives for the Marshall Islands including providing income for producers and manufacturers of local goods, reducing the dependence on imports, and improving the health of the community through the consumption of locally-grown healthy foods. There are various strategies for the development of the domestic market. It is important to ensure that the production and availability of local products grows alongside the demand that this program will generate. This means increasing agricultural production and also value-added products, and importantly, ensuring that these products have transport to bring them from their place of origin to the market, which will *primarily* be in the urban centers of Majuro and Ebeye.
Strategies	***Facilitating Access to Market*** ▪ Facilitate the establishment of local Farmers' Markets on Majuro and Ebeye (*see Special Program: Farmers' Markets);* ▪ Encourage investment in transportation; and ▪ Facilitate transportation from outer islands to urban centers through negotiation with transport companies. ***Market Research*** ▪ Understand the local market through market research; find out why people prefer imported products and respond to that. ***Active Promotions*** ▪ Hold local "Made in the Marshalls" trade fairs ; ▪ Promote "Be Marshallese…. Buy Marshallese" / " Juon Ri-Majol…. Wia Menin Majol"; ▪ Have all information on products available; and ▪ Be a role model- have coconuts, local produce featured in all R&D functions . ***Trade Policy*** ▪ Develop policy and recommendations on pricing of local products ; and ▪ Utilize allowances for "infant industries" and "negative lists" under the Pacific Island Countries Trade Agreement (PICTA) to encourage local industry.
Key Stakeholders and Partners	Local business/ retailers Farmers, manufacturers, producers Laura Farmers' Association Handicrafts Association Transport operators, AMI, Ministry of T&C Chambers of Commerce Forum Secretariat, PIC, PITIC (Aus, NZ)

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Establish data collection for domestic products sold	EPPSO		Trade Promotion Officer	Collected data on value of domestic products sold
	Carry out economic assessment of transporting produce from outer islands to urban markets and provide investors with information to facilitate development of transport infrastructure	EPPSO UNESCAP	Yr 1	Trade and Investment Policy Officer	Information provided to transport operators on economics of transport
	Design and carry out basic market research to understand consumer preferences		Yr 1 & as required	Trade Promotion Officer	Market research report on selected products
	Develop and run "Be Marshallese… Buy Marshallese" Campaign			Trade Promotion Officer	Campaign outputs such as brochures, newspaper ads, radio ads and programs, T-shirts, events.
	Develop and maintain catalogue or product info sheets of all Marshallese products		Yr 1 & ongoing	Trade Promotion Officer	Up-to-date Catalogue/ Product Info Sheets
	Develop and maintain Website with product info as above		Yr 2 & ongoing	Trade Promotion Officer	Up-to-date Website
	Develop handicrafts catalogue	UNDP Livelihoods Program	Yr 1 Q1	Trade Promotion Officer	Handicrafts Catalogue
	Hold local "Made in the Marshalls" Trade Fair for domestic market		Yr 1 & annually	Deputy Secretary	Fair held annually Satisfaction survey of participants
	Establish calendar of international and local conferences to coordinate with marketing events		Yr 1 Q1 & update as required	Trade Promotion Officer	

Possible Issues/ Constraints

Lack of experience in market research and survey design.

Capacity for policy development and economic assessment is limited within the Ministry.

Program B3: International Marketing Service

Objective	Increase exports of niche/ value-added products.
Measures	✓ Number and type of products being exported; ✓ Quantity and value of products being exported; and ✓ Profitability of products being exported.
Background	While the development of an export market for Marshallese products has been a priority for R&D, this strategic planning process allowed us to rethink its strategic importance to the Marshall Islands. As a result, the overall emphasis of this plan is on domestic product and market development, and import substitution. However, it remains that the Marshalls has some unique and important products that require the development of a niche international market. These products currently include handicrafts and Noni juice (and other products made from Noni) and may also include other products over time. The Marshall's primary exports currently are copra oil and processed fish. The strategic plan for R&D does not focus on fish, leaving fish as the primary responsibility of MIMRA. Copra oil prices have been consistently low and it has not been profitable recently as an export product (once subsidy is taken into account), therefore R&D are redirecting efforts on Copra to maximize value domestically (*see Special Program: Coconut Value Chain Development*).
Strategies	***Market Research*** ▪ Identify Markets; ▪ Contact Management – ensure that regular and professional contact is maintained with international buyers or potential buyers; and ▪ Understand the market through market research; find out what the market requires in terms of quality, quantity and type of product. ***Active Promotions*** ▪ Attend international trade fairs; and ▪ Have all information on products available.
Key Stakeholders and Partners	Local business/ retailers Manufacturers, producers Handicrafts Association Pacific Business Center, UH Honolulu Key contacts (for example Mary Lou Foley) Forum Secretariat, PIC, PITIC (Aus, NZ)

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Establish and maintain a database of international buyers or potential buyers		Yr 1 Q1 & Ongoing	Trade Promotion Officer	Database of buyers
	Maintain regular communication with international buyers about products via email		Ongoing	Trade Promotion Officer	# of communications to buyers
	Develop and maintain catalogue or product info sheets of all Marshallese products		Yr 1 & ongoing	Trade Promotion Officer	Up-to-date Catalogue/ Product Info Sheets
	Develop and maintain Website with product info as above		Yr 2 & ongoing	Trade Promotion Officer	Up-to-date Website
	Develop handicrafts catalogue	UNDP Livelihoods Program	Yr 1 Q1	Trade Promotion Officer	Handicrafts Catalogue
	Attend international trade fairs as appropriate		Ongoing	As appropriate	# of events attended # of enquiries/ contacts added to database

Possible Issues/ Constraints

Export of products, particularly food stuffs and products for consumption, will only be possible if the RMI meets requirements in terms of food safety, quality assurance and labeling requirements.

Program B4: Trade Facilitation Services

Objectives	Ensure export products meet international requirements; Have smooth and efficient export permit processes ; and Facilitate trade by ensuring RMI meets import and export standards .
Measures	✓ # and type of products that meet export requirements.
Background	Trade Facilitation Services will essentially provide support to manufacturers and exporters in meeting import / export requirements. This will include compliance of manufactured products with international safety standards (Codex Alimentarius and HACCP), issuance of certificates of origin and streamlining of import and export documentation processes.
Strategies	▪ Export certificate of origin (Ensure pest list is updated); ▪ Recruitment or development of a sufficiently skilled person; ▪ Become a member of Codex Alimentarius ; ▪ Utilize membership of Codex Alimentarius to gain access to training; ▪ HACCP and Codex Alimentarius training to manufacturers ; ▪ Improve trade documentation, issuing import/ export certificates, certificates of origin; and ▪ Ensure all necessary information about products is documented. Plans to develop some processed food and medicine products means the Quarantine service will need to develop capacity in HACCP certification to ensure the quality and safety of exported food products .
Key Stakeholders and Partners	Food and Nutrition Task Force (Ministry of Health) Customs Transport Operators MIMRA FAO Codex Alimentarius WHO USDA Importers/ Exporters WTO

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Harmonize quarantine regulations with FSM and Palau	FAO and partners in Palau and FSM	Yr 2	Secretary	Quarantine regulations
	Recommend to Cabinet that RMI become a member of the Codex Alimentarius	Food & Nutrition Task Force	Yr 1 Q3	Secretary	Recommendation to Cabinet
	Develop a national approach to HACCP and Codex Alimentarius compliance for export	Food & Nutrition Task Force	Yr 2	Secretary	Documented national approach outlining roles and responsibilities of different agencies
	Ensure pest list is up-to-date (refer also to Program A2)	SPC USDA	Yr 1 Q4	Head Quarantine Officer	Updated Pest List maintained
	Create and maintain registry of importers and exporters		Yr 1 Q3	Trade Promotion Officer	Registry of importers and exporters
	Improve process of issuing certificates of origin and import/ export permits		Yr 2	Head Quarantine Officer	Clear documented procedures for the issuance of these

Possible Issues/ Constraints

This program will need highly qualified people skilled in food safety and quality assurance. The recruitment of such a person may take several years. (See *Program E1: Human Resource Management*).

Program Area C: Investment and Business Development

C1: Micro-Finance Services

C2: Small to Medium Business Services

C3: Investment Information and Facilitation Services

C4: Trade and Investment Policy

Program C1: Micro-Finance Services

Objective

Encourage economic growth through providing access to small loans and credit, particularly for those in the community who have difficulty accessing current credit facilities.

Measures

- ✓ Number of small loans provided to individuals and credits;
- ✓ Default rate on loans;
- ✓ Total value of loans provided; and
- ✓ Economic development on outer islands linked to access to credit.

Background

A key obstacle to the development of income-generating opportunities and small-scale businesses, particularly on the outer islands, is a lack of access to credit. Access to micro-finance can enable individuals or families to purchase basic tools and equipment to then generate income, such as tools for farming, small boats for fishing or tools and other equipment.

Various examples of the success of these programs in economic development can be seen around the world, including the famous Grameen bank in Bangladesh.

This program requires considerable attention from the Ministry to facilitate the establishment of a micro-finance facility in the Marshall Islands, that can provide access to outer- island communities in particular.

Strategies

- Investigate possible institutional arrangements for a micro-finance service; and
- Work with key stakeholders to develop an approach to microfinancing.

Key Stakeholders and Partners

Marshall Islands Development Bank (MIDB)
United States Department of Agriculture (USDA)
Small Business Administration (SBA-US)

Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
Investigate and facilitate the establishment of micro-credit facilities in the RMI	MIDB USDA SBA	Yr 2	Secretary R&D	Micro-credit facility established
Facilitate the MIDB to provide commercial loans (i.e. not secured by allotments)	MIDB	Yr 2	Secretary R&D	MIDB provided loans unsecured by salary allotments

Possible Issues/ Constraints

The establishment of a micro-finance facility can not be done directly within the existing institutional structure of the Ministry of R&D, thus the success of this program depends very much on the degree of participation of other stakeholders, including the MIDB.

Program C2: Small to Medium Business Development

Objectives	Enhance employment growth in the private sector through business creation/ expansion; Encourage economic growth through sustainable business development; and Start to promote export-oriented growth through expansion/ diversification of the markets.
Measures	✓ Number of jobs created and sustained as a result of SBDC activities; ✓ Number, type and size of businesses established or developed through SBDC activities; and ✓ Impact on outer island, low-income or disadvantaged communities.
Background	The Small Business Development Center has been established under a technical assistance program from the US Small Business Administration.
Strategies	▪ Provide high-quality one-on-one counseling sessions to deliver management and technical assistance to existing and prospective businesses; ▪ Provide workshops that cover the basics of starting and running a business; ▪ Identifying business opportunities in the RMI including the areas of: o Agriculture o Aquaculture and fisheries o Tourism o Small-scale manufacturing o Handicrafts o Retail outlets o Service industries ▪ Identify and facilitate access to sources of capital and credit including the MIDB and other banks, and also private investors or business partners- to focus on outer islands or similarly disadvantaged communities; ▪ Actively network in the business community through the Chamber of Commerce and other business-oriented associations; and ▪ Leverage agriculture extension visits to outer islands as a way to deliver information about services.
Key Stakeholders and Partners	Small Business Administration (SBA-US) Pacific Island Small Business Development Center Network (PISBDCN) Majuro Chamber of Commerce Ebeye Chamber of Commerce Marshall Islands Development Bank Pacific Business Center, UH Honolulu

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Develop and maintain a list of business opportunities or areas of market demand		Yr 1 Q2	Director, SBDC	List produced
	Assist businesses in obtaining financing through preparation of business plans and loan applications	MIDB	Ongoing	Director, SBDC	# and type of business plans
	Develop and distribute calendar of events		Yr 1 Q1	Director, SBDC	Calendar produced
	Advertise and promote services and workshops through radio, press, associations and directly to clients		Ongoing	Director, SBDC	# of radio announcements # of newspaper articles and announcements
	Deliver one-on-one management and technical counseling		Ongoing	Director, SBDC	# of clients # of counseling sessions
	Sponsor or deliver training workshops in business		Ongoing	Director, SBDC	# of workshops
	Provide the Young Entrepreneur Training Course		Twice annually	Director, SBDC	Workshops run
	Seek funding from external sources and retain government funding		Ongoing	Director, SBDC	Amount of funding
	Establish and maintain information center		Yr 1 Q2	Director, SBDC	Information center established

Possible Issues/ Constraints

The main constraint for the SBDC is the access to micro-finance facility for our clients.

Another constraint is the access to the outer islands and their communities. This will require careful planning for travel and should link closely with visits by the Agriculture Extension Officers.

Program C3: Investment Information and Facilitation Services

Objectives	Increase foreign and domestic investment in the Marshall Islands; and Facilitate the administrative processes for investment
Measures	✓ Amount of foreign investment in the RMI, by business type; ✓ # of Foreign Investment Business License issued by type and amount; ✓ # of local business licenses issued (by atoll); ✓ # of jobs created locally; ✓ # of joint local/ foreign investment partnerships; and ✓ Increase in number of queries.
Background	This program is designed to facilitate and promote foreign and domestic investment in the Marshall Islands to achieve greater self-sufficiency, alleviation of poverty, increased employment opportunities and the other social benefits of greater economic activity, such as improved education and health systems. A focus of this program is to identify and reduce administrative barriers to investment.
Strategies	▪ Develop economic partnerships between foreign and local companies; ▪ Develop policies that encourage investment; ▪ Provide clear, succinct and up-to-date information to investors; ▪ Streamline investment-related administrative processes; ▪ Track investment activities through collection and management of information (Info Mgt Strategy); ▪ Actively promote the Marshall Islands' investment opportunities and investment climate to potential investors; ▪ Encourage *sustainable* development by assessing investments for their social, environmental and economic impact (coordinating with RMIEPA and EPPSO); ▪ Provide assistance in obtaining administrative approvals to investors on an ongoing basis; and ▪ Develop local awareness of foreign investment.
Key Stakeholders and Partners	EPPSO Attorney-General's Office Foreign Investment Advisory Service (FIAS - Australia, World Bank, Forum Secretariat)

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Identify local and foreign potential investors		Yr 1 Q2	Investment Promotion Officer	
	Establish and maintain a database or contact management system for potential foreign and local investors		Ongoing	Investment Promotion Officer	Database established
	Send information about changes in policy, investment environment or investment opportunities to contacts, as appropriate		Ongoing	Investment Promotion Officer	# and type of communications
	Develop clear and concise guidelines for establishing a foreign investment business or a local business	AG	Yr 1 Q2	Investment Promotion Officer	Process reviewed and improved and clear guidelines published
	Disseminate information on foreign investments, business license regulations, and other related information for foreign investors		Ongoing	Investment Promotion Officer	Information communicated
	Actively network in the business community through the Chambers of Commerce and other business-oriented associations	Chamber of Commerce	Ongoing	Investment Promotion Officer	# of Chamber events attended # of activities arising from networking (i.e. responses to queries)

Possible Issues/ Constraints

There needs to be improved collaboration with the AG's office to gather investment data.

Need to develop a good working relations hip with the Chambers of Commerce.

Program C4: Trade and Investment Policy

Objective	Develop Trade and Investment Policies to contribute to the economic development of the RMI.
Measures	✓ Increase in investment in the RMI.
Background	While Trade and Investment Policy is a critical part of private sector development in the RMI, there is limited capacity to carry out effective policy development. The Ministry will need to focus on recruiting, developing and retaining human resources to fill this role.
Strategies	▪ Solicit technical assistance for policy development from international agencies (listed here as stakeholders); ▪ Identify and remove barriers to investment; ▪ Identify opportunities to develop Marshallese industry using policy tools (such as trade tariffs) while still complying with necessary trade agreements; ▪ Carefully assess the costs and benefits of international trade agreements for the RMI.
Key Stakeholders and Partners	UNESCAP UNIDO WTO FIAS/ ADB Forum Secretariat Customs Quarantine

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Identify administrative barriers and develop actions to address these	FIAS (ADB) Attorney-General		Trade and Investment Policy Officer	Report identifying barriers and recommendations Barriers removed
	Establish an investment committee to discuss investment related issues	EPPSO AG Chambers Key Business People	Yr 1 Q4	Trade and Investment Policy Officer	Investment committee meets on a regular basis
	Revise and publish the National Investment Policy		Depending on policy changes	Trade and Investment Policy Officer	Revised policy document
	Establish a process for assessing the economic, social and environmental sustainability of investments	EPPSO RMIEPA	Yr 3-5	Trade and Investment Policy Officer	Process documented Process implemented
	Develop "negative list" and "Infant industries" list for the RMI and recommend policy options to protect these local products (i.e. tariffs)		Yr 1 Q1 & update as required	Trade and Investment Policy Officer	Policy recommendation on "negative" trade list
	Develop policy recommendations for pricing control for domestic products to increase their competitiveness	IA EPPSO		Trade and Investment Policy Officer	Recommendations made to Cabinet on pricing of local products

Possible Issues/ Constraints

At the time of writing, the position of Trade and Investment Policy Officer was vacant. There may be difficulty in recruiting a suitably qualified person for this role.

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Program Area D: Energy Services

D1: Outer-Island Electrification

D2: Other Energy Services

Program D1: Outer-Island Electrification

Objectives	Providing access to electricity in the outer islands in a way which contributes to real economic development of outer island communities.
Measures	✓ Number of outer island households with access to electricity; and ✓ Impact on quality of life (need measures here).
Background	Access to electricity is important for economic and social development in the Outer Islands of the RMI. This program will develop appropriate strategies for Outer-island electrification, and access to other sources of power such as fuel. The approach requires significant rethinking of electrification strategies up to this point, including the costs, benefits and lessons learned from solar electrification. The program is strongly supported by SOPAC under the Forum Secretariat. This program also links very strongly with *Special Program 1: Coconut Value Chain Development.*
Strategies	▪ Careful assessment of needs and uses of outer islands for electricity and development of appropriate electrification strategies; ▪ Integration with Coconut Value Chain Development Project; and ▪ Focus on developing fuel sources in the form of coconut oil processed on-island.
Key Stakeholders and Partners	SOPAC MEC Local Governments Private sector

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Capacity Building for Energy Planner - attachment to SOPAC, Professional Networking and understanding regional and international sources of assistance	SOPAC	Yr 1 Q2 & ongoing	Energy Planner	Individual has enhanced understanding of energy policy issues and has a network of people and resources regionally
	Economic assessment of Coconut Value Chain & comparison of rural electrification options	SOPAC	Yr 1 Q3	Energy Planner	Report containing economic assessment
	Review electrification work to-date on Namdrik and lessons learned- including the impact of the project on poverty alleviation	SOPAC Namdrik LG	Yr 1 Q3	Energy Planner	Report containing review, lessons learned, recommendations
	Develop of Outer-Island Electrification Strategy with renewed focus on poverty alleviation	SOPAC	Yr 1 Q4	Energy Planner	Outer-Island Electrification Strategy Document
	Establish and maintain inventory of electricity systems and projects on all outer islands	Ministry of Internal Affairs	Yr 1 Q2	Energy Planner	Database of outer-island electricity systems

Possible Issues/ Constraints

This program is highly dependent on technical and financial assistance from SOPAC.

It also involves a significant shift in policy away from solar energy and there may be parties with vested interests in this area.

Program D2: Other Energy Services

Objectives

Provide energy policy development and other energy services in a way that contributes to the social and economic development of the Marshall Islands.

Measures

- ✓ Production and dissemination of policy documents.

Background

RMI is heavily dependent on imported fuel for its energy supply. Currently, a gallon of gas costs $3 on island and $5-$7 in the outer islands. Preliminary figures show that power generated from copra oil costs around 40 cents/kWh, while solar electricity costs three times this amount, about $1.20/kWh.

There is a strong need to re-evaluate current fuel pricing policies and other related regulations in order to provide recommendations for policy development.

Strategies

- Policy development and implementation;
- Education and awareness campaigns; and
- Information management to assist in policy development.

Key Stakeholders and Partners

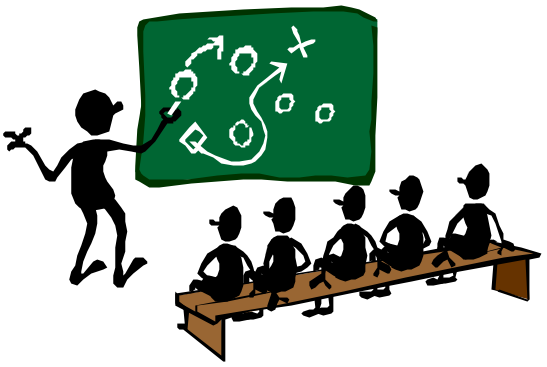
MEC
SOPAC
Local Governments
Private sector

#	*Activity*	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Public awareness campaigns on: – Energy Efficiency – Petroleum products safety	Ag Extension officers	Yr 1 for materials Yr 2 for dissemination	Energy Planner	Campaign materials such as brochures, radio spots,
	Investigate and develop policy on vehicle taxes/ duties covering fuel consumption and disposal levy	MoFinance	Yr 2	Energy Planner	Policy recommendation
	Monitor and maintain data on copra oil prices and landed diesel prices, usage statistics and other useful statistics.	Tobolar MEC Mobil EPPSO MoFinance	Yr 1 Q1	Energy Planner	Database of useful statistics, updated
	Develop Fuel Pricing Policy for Majuro and Outer Islands		Yr 2	Energy Planner	Fuel Pricing Policy recommendations to Cabinet
	Review of National Energy Policy		Yr 3	Energy Planner	Revised National Energy Policy

Possible Issues/ Constraints

None identified.

Program Area E: Management and Administration



Goal ***A motivated, happy and skilled team that develop well-planned activities and achieves its goals.***

E1: Human Resource Management

E2: Planning, Measurement and Reporting

E3: Information Management

Program E1: Human Resource Management

Objectives

Have a documented Staff Performance Management System that is used by all staff;

Personal performance plans and work plans are clearly linked to the Strategic Plan;

Staff and supervisors have skill and comfort in using the system- in developing plans and in giving and receiving feedback; and

A recruitment plan that will ensure the Ministry has the required skills and competencies in the future.

Measures

- ✓ Improved staff satisfaction with performance management system (as distinct from the current PSC evaluation system);
- ✓ Improved job satisfaction; and
- ✓ Decreased absenteeism.

Background

The Ministry of R & D recognizes that Capacity-building is about improving the skills and competence of Ministry staff, and that it is also about utilizing the current skills more fully through improved work planning and motivation.

Performance Management is a process by which staff members are able to clarify work objectives and learning is promoted. Skills are developed to contribute to the broader goals of the organization. The aim is to create a work environment that enables and supports employees.

Through explicit processes, negotiation and mutual agreement the organization's goals are more effectively met and staff members are enabled and involved. Individual staff members develop skills and knowledge in identified areas. They are supported in planning for personal and career aspirations.

In the near future the Ministry needs to recruit and retain staff with professional-level skills in Agriculture, Business, Economics and Trade, HACCP or Food Technology and Resource Management.

Strategies

Staff Performance Management System

- Performance management system that focuses on employee development and accountability;
- Development of management skills in coaching, motivating staff, and in managing underperformance; and
- Improving recognition and reward systems, including salaries, but also the supervisors' acknowledgement and praise of staff.

Strategic Recruitment

- Recruiting people with appropriate skills ;
- Recommending areas for study to the scholarship board and linking scholarships with internships and jobs upon completion of studies ; and
- Providing internships to undergraduate students .

Professional Development

- Screening for training courses ; and
- Strong commitment to ongoing professional development of staff through overseas attachments, long-term ex-patriate counterparts and formal study.

Key Stakeholders and Partners

All Ministry staff and management

Scholarship Board

CMI, high s chools, Ministry of Education

All regional and international organizations that can assist with Capacity-building

Activity	Partners	Timing	Responsibility	Outputs/ Measures
Develop guidelines for Performance Management and incorporate into policy		Yr 1 Q1	Secretary	Document describing policies and processes
Develop an Employee Performance Plan for each employee		Yr 1 Q2	Each Supervisor	Plans developed for all employees
Develop a Personal Development Plan for each employee		Yr 1 Q2	Each Supervisor	Personal Development plans developed for all employees
Link performance to salary increases in HR policy	PSC	Yr 2	Secretary	Policy linking performance to salary is documented
Carry out quarterly progress meetings with each employee		Yr 1 Q2 and Ongoing	Each Supervisor	Number of progress and review meetings carried out
Carry out annual review meetings with each employee		Yr 1 Q4 and annually	Each Supervisor	Review meetings for all employees
Review Performance Management System annually			Secretary	System reviewed
Establish appropriate filing system for personnel files- both hard copy and electronic copy		Yr 1 Q1	Chief, Administration	Filing System established and all supervisors trained in using the system
Establish internship and College Work-study program within the Ministry	CMI USP	Yr 1 Q2	Chief, Administration	1 College Work-study and 2 Summer Interns per year
Develop a list of required professional skills for the next 3-10 years, and arrange for scholarships in these areas	Scholarship Board	Yr 1 Q2	Secretary	List of professional skills and scholarships arranged
Visit schools to promote careers with the Ministry of R&D.	Ministry of Education/ Schools	TBD	TBD	# school visits and career days
Actively recruit young people for these scholarships through advertising	Scholarship Board	During scholarship cycle	Secretary	Young people studying the identified professional needs

Possible Issues/ Constraints

Human Resource management requires consistent, positive messages from the leadership and ongoing visible commitment.

Formalizing the salary structure depends on cooperation from PSC and is subject to government-wide policies, however, this is an important part of the motivation of employees.

Program E2: Planning, Measurement and Reporting

Objectives	Develop and maintain a working strategic plan for the Ministry of R&D, that is accepted by staff and stakeholders; Develop and maintain annual program plans and budgets that clearly correspond to the strategic plan; and Effectively report against the strategic and annual program plans to key stakeholders, including the requirements for Compact reporting.
Measures	✓ Strategic plan published and signed-off by all staff; ✓ Program/ operational plans developed for all activities in the current year; ✓ Increased focus and satisfaction of staff (qualitative by staff survey); and ✓ Written program plans that are reviewed and updated annually.
Background	Essential to effective operation of any organization is the development of shared goals and objectives, and the development of plans or "roadmaps" to help achieve those objectives. This document forms one output of the strategic planning process and will be supported by more detailed project and program plans. It is necessary for the Ministry of R&D to have an ongoing focus on the planning process, monitoring or progress against plans, and the review of plans.
Strategies	▪ Develop organization-wide skills in strategic and project/ program planning; ▪ Regular review of plans; ▪ Have consistent management and Ministerial focus upon the achievement of the plan; and ▪ Develop skills in performance-based budgeting.
Key Stakeholders and Partners	US Department of Interior/ JEMFAC (Performance-Based Budget) EPPSO Ministry of Finance (Budget Office)

Activity	Partners	Timing	Responsibility	Outputs/ Measures
Develop and sign-off on strategic plan	Consultant	Yr 1 Q1	Secretary	Strategic plan signed-off by all staff and Board members
Review and Sign-off on strategic plan		Yr 1 Q4 & Annually	Secretary	
Develop new strategic plan	Consultant	Year 3 to 5	Secretary	Strategic Plan Document
Develop and maintain annual work plans		Yr 1 Q1	Each Supervisor	Written plans for each department
Develop and maintain annual performance-based budget	Dept.of Interior Consultant	According to budget cycle	Secretary Chief, Administration	Performance-based budget submitted
Collect baseline data for each of the measures and targets in the strategic plan	Consultant	Yr 1 Q1	Chief, Administration	Baseline measures for appropriate areas
Review measures and monitoring mechanisms based on availability of data and ease of collection	Consultant	Yr 1 Q2	Secretary	Revised list of measures
Collect measures annually	Consultant	Annually	Chief, Administration	Measures collected and recorded
Report on measures against plan	Consultant	Annually	Chief, Administration	Report on achievements against the plan
Hold weekly department meetings for work planning- every Monday morning		Weekly	Each Supervisor	Weekly work plans and minutes

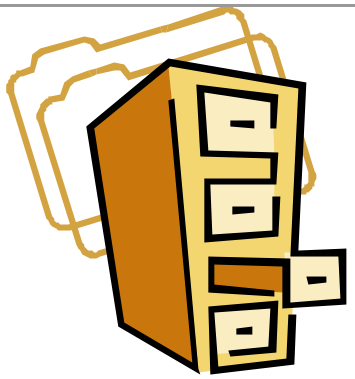
Possible Issues/ Constraints

The effectiveness of this program underlies all of the Ministry's work and will depend very much on the continued focus from and attention of the Secretary and the Minister, as well as ongoing support to develop staff planning skills.

As the measures are collected over the first couple of years, they will need to be reviewed as some will be inappropriate or too difficult to quantify.

The success of this program will depend on a shift in measurement focus from financial results towards outcomes and outputs.

Program E3: Information Management



Objective	Have information managed and easy to access for all employees and others.
Measures	✓ Staff satisfaction with information management (by survey)
Background	Information management is a core organizational process; that is, a basic function of an organization that allows it to achieve its objectives. Information and the management of information is an essential part of organizational capacity, along with Human Resources and Planning and Management. Information management will enable the Ministry and its customers to make informed, information-based decisions. The implementation of this strategy will involve establishing basic services such as a library and electronic and hard copy filing systems. Information management is the responsibility of all departments and employees.
Strategies	▪ Hold reference material and research to meet future needs in decisions and policy development; ▪ Electronic shared file system; ▪ Upgrading of computer network; and ▪ Catalogued library of hard-copy resources from all sources.
Key Stakeholders and Partners	Provider of IT services

	Activity	*Partners*	*Timing*	*Responsibility*	*Outputs/ Measures*
	Upgrade computer network	Contractor	Yr 1 Q2	Chief, Administration	Computer network in place and functioning
	Establish individual email addresses for employees and an internal mail system		Yr 1 Q2		
	Set up protocol for file sharing and a shared electronic file management system		Yr 1 Q1	Chief, Administration	File management and document control protocol in place and documented
	Set up protocol for hard-copy files, especially for personnel files		Yr 1 Q1	Chief, Administration	
	Create functional hard-copy library		Yr 1 Q4		All relevant hard copy publications and documents catalogued in library

Possible Issues/ Constraints

There is limited access to IT professionals and training on-island.
Funds may need to be reallocated to upgrade the network system.
Lack of maintenance of the network.

Overarching Objectives Impacting R&D

Compact of Free Association as amended

Private Sector Development

Title Two- Economic Relations

Article 1, Section 211 (a) (3) Private Sector Development. United States grant assistance shall be made available in accordance with the strategic framework described in subsection (f) of this section to support the efforts of the Republic of the Marshall Islands to attract foreign investment and increase indigenous business activity by vitalizing the commercial environment, ensuring fair and equitable application of the law, promoting adherence to core labor standards, maintaining progress toward privatization of state-owned and partially state-owned enterprises and engaging in other reforms.

Vision 2018

Vision 2018 is a 15 year strategic development plan for the Marshall Islands that was developed in a consultative process. The following Goals, Objectives and Strategies are those that the Ministry of R&D has identified as being the most relevant to its Mission. The Ministry has attempted to address these strategies where possible, and where they are not addressed this is due to constraints from resources and capacity in the next few years

Goal 2- Enhanced socio-economic self-reliance

Sub-Goal A: Macroeconomic Framework

Objective 1: Developing, diversifying and strengthening our economic base so as to generate maximum feasible self-sustaining level of national income and domestically generated Government revenues.

Strategy:

Enhancing and implementing policies and programs aimed at increasing productivity and efficiency at all levels of the economy including Public Sector, Private Sector, Rural Economy, NGOs and Households.

Objective 3: Achieving a more balanced structure in the economy with a greater reliance on foreign exchange earning/ import substitution sector.

Strategies:

Developing foreign exchange earning/ import substitution sector in the economy, including mainly agriculture, fisheries, tourism , manufacturing, IT industries, airspace and seabed potential;

Promoting Outer Island Development;

Provision of adequate infrastructure services, especially in the outer islands;

Creating a conducive environment for the Private Sector growth including foreign investment particularly aimed at promoting foreign exchange earning/ saving activities;

Promoting Human Resources Development; and

Adopting measures to ensure credit accessibility from the banking sector for small and medium businesses especially in the Outer Islands aimed at export earning/ import substitution production.

Objective 4: Ensuring optimal accessibility to opportunities to ensure wider participation of women in the self-reliant and sustainable development process in the country.

Objective 5: Ensuring an acceptable level of equity in the distribution of national income among different income groups, within families and among family members.

Strategies:

Strengthening and implementing policies aimed at raising the income of low-income groups; and

Strengthening and implementing policies and programs directed towards minimizing the level of unemployment in the economy.

Sub-Goal B: Food Security "To attain food security for all people at all times and to substitute imports to the best extent possible and develop exports"

Sub-Goal B Sector B1: Agriculture

Objective 1: Increase output of local foods and agricultural exports

Strategies

1) Establish Farmers Markets in Urban centers;

2) Education of people in regard to making healthy choices when purchasing imported food sold in stores and local food preparation;

3) Promote and encourage "Home Garden" concept and seedlings of plants and crops that currently grow only on certain atolls be made available at reasonable cost to Outer Island farmers and sharing of seed stock from our biodiversity be encouraged;

4) Establish a reliable marketing organizational structure;

5) Facilitate easy access by farmers to agricultural tools and extension and research services;

6) Review and if appropriate, replicate Enewetak agricultural development model to other Atolls;

7) Facilitate availability of credit to farmers;

8) Promote growth in agriculture based on comprehensive corporate plans for agricultural diversification and development with emphasis on Outer Islands;

9) Implement measures to increase value-added products based on coconut oil such as better quality soap;

10) Increase the distribution of goods or manufactured products at the copra processing plant;

11) Urge traditional leaders to promote and encourage communities to grow more traditional local foods and also request that they establish partnership with schools in order to revitalize land left idle as a means of encouraging higher production of local food;

12) Provide assistance to encourage preservation of traditional foods;

13) Diversify agriculture on Outer Islands to generate additional incomes;

14) Establish a "Kitok Maro Day" to encourage tree-planting especially those trees that bear fruits and which could also be used for commercial purposes such as handicrafts;

15) Assist in developing hydroponics; and

17) Assist people in eradicating pests and diseases that infest food crops.

Objective 2: Achieve healthy and balanced diets to minimize both malnutrition and obesity

Objective 3: Increase output of locally processed foods and supplements

Strategies:

1) Increase agricultural surplus available for processing;

2) Education in food processing technology;

3) Encourage small business in food processing;

4) Fostering commercial small-agri business at household level;

5) Review "Grameen Bank" model and identify its merits for application in the Marshall Islands; and

6) Extend the required agriculture infrastructure to Outer Islands.

Objective 4: Increase utilization of idle land

Strategies:

1) Rehabilitate and replant coconut plantations;

2) Review and grow [appropriate] trees around atolls to keep salt spray out;

3) Replant commercially valuable trees and crops needed for handicrafts; and

4) Consult with traditional leaders and landowners to identify lands for replanting.

Objective 5: Decrease the adverse impact of natural disasters

Strategies:

1) Promote crop and livestock management system, which will help alleviate and reduce the adverse impact of, and at the same time facilitate early response; and
2) Develop of on emergency response plan and training program to control and eradicate pest and disease outbreaks.

Sector B3: Manufacturing

Objective 1: Enhancing the production and processing of local food and other products for domestic consumption and export.

Strategies:

1) Identify markets both domestic and overseas for local products that have the potential;

3) To facilitate and promote foreign and domestic involvement in the development of our economy through partnership between foreign and local companies;

4) Establish a Product Development Unit within the Ministry of Resources and Development which would focus on the development of product oriented business activities;

5) Ensure availability of infrastructure services such as transport, energy, water and communication to facilitate manufacturing especially in selected development sites in the outer islands;

6) Ensure availability of skilled labor through appropriate training programs;

7) Establish a handicrafts manufacturing center using skilled and renown handicraft producers; and

8) Review and increase import duties on those goods that could be produced nationally as an incentive to develop and produce those goods domestically.

Objective 2: Creating an enabling environment for manufacturing activities.

Objective 3: To identify and promote new products.

Goal 3- An Educated People

Establishing a knowledge-based economy by equipping Marshallese citizens with internationally competitive skills, qualities and a positive attitude to work and society.

Goal 5- A Productive People

Enabling Marshallese within their capacity and capability to develop a sense of purpose, take initiative, participate and contribute in the sustainable development of our nation.

Goal 9- Respecting our culture and traditions

Preserve, strengthen and promote our language, traditional skills, knowledge, values and customs to maintain the cultural identity of all Marshallese people.

Strategy:

4) Strengthen and preserve our traditional skills especially in agriculture, environmental conservation, and fishing and fisheries management as reinforcements of our identity as Marshallese.

Goal 10: Environmental Sustainability

Objective 2: To develop and have in place a contingency/ adaptation plan to counter the emerging threats resulting from the adverse effects of Climate Change.

Strategy:

3) Promote planting of all types of trees to counteract the emerging threats of Global Warming and Sea Level rise.

Organizational Chart

Ministry of Resources and Development

November 2004