

# NGIWAL STATE PROTECTED AREAS AND NATURAL RESOURCE MANAGEMENT PLAN



2010-2015

*Vision: The people of Ngiwal State want to improve their livelihood through sustainable developments (including promotion of eco-tourism) and conservation of its natural resources to ensure healthy communities and ecosystems for future generations.*

Prepared by The Nature Conservancy –Palau Field Office  
through Babeldaob Watershed Alliance

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## Acronyms

BWA	—	Babeldaob Watershed Alliance
PCS	—	Palau Conservation Society
PICRC	—	Palau International Coral Reef Center
BNM	—	Bureau of National Museum
BoA	—	Bureau of Agriculture
PALARIS	—	Palau Automated Land and Resource Information System
CAP	—	Conservation Action Planning
KAK	—	Kelulul a Kiuluul
KEDA	—	Kiuluul Economic Development Authority
MNRET	—	Ministry of Natural Resource Environment and Tourism
NSPLA	—	Ngiwal State Public Lands Authority
PAN	—	Protected Areas Network
SWOT	—	Strengths, Weaknesses, Opportunities, Threats
TNC	—	The Nature Conservancy
EQPB	—	Environmental Quality Protection Board

## Executive Summary

The Ngiwal State Protected Areas and Natural Resources Management Plan took almost a year to complete with active participation and consensus of Ngiwal Leadership and community members. The preparation of the plan involved comprehensive strategic planning and discussion of concepts for protected area and State wide natural resources management.

In 2008, the Kelulul a Kiuluul Legislature passed Bill No. 13-5-002 to authorize and mandating the Governor of Ngiwal State to protect the Olselkesol Watershed and Ngerbekuu Nature Reserve. The further mandated the Governor to prepare a management plan for the conservation and protection of the Watershed and Ngerbekuu River. The management planning process began when this designated Protected Area formally joined the Protected Areas Network in 2008. A Conservation Action Planning (CAP) workshop was conducted in June 2009 to help the people of Ngiwal to map out a road map for the management and conservation of their resources. The workshop identified key conservation targets, critical threats to the targets, and identified strategies to address their natural resource issues.

The preparation of the management plan began with Ngiwal people in July 2009, where they were advised to draft a Statewide natural resource management plan to address the concern raised in the CAP workshop. Simply focusing management of the Protected Area alone will not be sufficient to address their declining natural resources.

This five year management plan focus on (1) managing allowable activities within the Protected Areas (2) reducing the threat of overexploitation of Ngiwal natural resources through resource use zones, (3) developing an effective conservation enforcement program within Ngiwal State, (4) developing sustainable ventures in Ngiwal to improve the livelihood of its people, and (5) building a resilient Ngiwal community to potential impact of sea level rise by providing them with adequate information and guidelines to help plan the future of their coastal community.

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## **1 Introduction**

### **1.1 Need for a management plan**

In an effort to ensure sustainable use of Ngiwal State's natural resources and to maximize benefits to improve the livelihood of Ngiwal people, the Ngiwal State Government sees the need to actively manage its resources for present use and to ensure there are available resources for future generations. To this end, the Ngiwal State Legislature (KAK) has mandated the Governor of Ngiwal State to protect and conserve Oselkesol Waterfall and Ngerbekuu Nature Reserve through NSPL 13-2/KAK Bill no. 13-1S-002. In addition to this new terrestrial Protected Area, Ngiwal State has an existing marine Protected Area (Ngemai Conservation Area) that has been close since 1997 without active management. Ngiwal State has invested initial resources in this area and therefore active management is required to ensure that the initial investment by the State will achieve benefit for the people of Ngiwal. Ngiwal State has agreed to include the Ngemai Conservation Area under the Protected Areas Network. Furthermore, management of these specific areas alone is not sufficient to ensure healthy and sustainable natural resources for the people of Ngiwal and will require active management of activities in surrounding areas and for resources that are regularly exploited. A comprehensive natural resource management plan for Ngiwal State is required to ensure effective management of the existing protected areas and to manage use and exploitation of the State's natural resources.

### **1.2 Management authority**

The Palau's constitution identifies States as the exclusive owners of living and non-living marine resources, except highly migratory fish, from the coastline to 12 miles beyond the reef edge. All natural resources within state of Ngiwal and out to 12 miles of the shoreline are within state jurisdiction. In practice, the management of these resources/ areas lies within the Office of the Governor of Nigwal State. The Governor may create and/or assign state entities or employees to oversee and/or implement management

activities for State owned resources or within specific sites as necessary and in accordance with the relevant statutes of the State. NSPL No. 13-2/KAK Bill no. 13-1S-002, which established the Oselkesol Waterfall and Ngerbekuu Nature Reserve reaffirms this authority by delegating the management of the Reserve to the Governor and establishes the Oselkesol Waterfall and Ngerbekuu Nature Reserve Board to advise the Governor on management of these specific areas.

### **1.3 Planning process**

This plan began after Ngiwal State went through a Conservation Action Planning (CAP) workshop in June 2009. The workshop involved active participation of Ngiwal Governor, traditional leaders, members of KAK, member of the Nature Reserve Board, and members from Ngiwal community. The workshop helped the people of Ngiwal to identify important conservation targets and critical threats to these targets. General strategies for addressing critical threats and to improve important conservation targets were also identified during this workshop.

Prior to the CAP workshop, Ngiwal has already nominated the Oselkesol Waterfall and Ngerbekuu Nature Reserve to the Protected Areas Network and was accepted in 2008. One of the requirements for PAN is a management plan for the conservation site. Ngiwal sought the assistance of BWA technical committee and the PAN Office for drafting of the plan.

The management planning process began with the review of the CAP workshop documents and discussions. Based on the overall concerns of Ngiwal people for decreasing natural resources and the conservation approach of protected area that Ngiwal has already undertaken by joining PAN, the technical committee through series of meeting with the Ngiwal team advised them to draft a statewide natural resource management plan with special focus on the PAN site. The rationale behind this approach was that the Ngiwal PAN site is small and does not address the major concerns facing Ngiwal resources raised in the CAP workshop. The State agreed and the planning

process continued with BWA technical committee providing recommendations for management approach which are agreed upon through a series of meetings with Ngiwal people to seek their consensus.

#### 1.4 SWOT Analysis

The following table is a strength/weakness—opportunities/threats (SWOT) analysis developed by the Ngiwal BWA Steering Committee members during a BWA work planning meeting held in April 2009 and was further refined during the review of the draft management plan meeting in December 2009.

		<i>Internal</i>	<i>External</i>
<b>Positive</b>	<b>Strengths</b>	<ul style="list-style-type: none"> <li>• Political will</li> <li>• Newly created protected areas</li> <li>• Active involvement of traditional leadership</li> </ul>	<b>Opportunities</b> <ul style="list-style-type: none"> <li>• Technical assistance from the BWA</li> <li>• Partner agencies who are willing to help</li> <li>• Potential for developing ecotourism</li> <li>• Access to PAN (“green Fee”)</li> <li>• Strong national conservation policy</li> <li>• National political will</li> </ul>
	<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>• Lack of funding</li> <li>• Lack of public infrastructure</li> <li>• Lack of trained human capacity for management</li> <li>• Improvement and implementation of master development plan</li> <li>• Lack of public awareness</li> <li>• Lack of enforcement</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• Unregulated development</li> <li>• Storms, droughts, bleaching events and other global impacts</li> <li>• Pollution</li> </ul>
<b>Negative</b>			

Table 1. SWOT Analysis for Ngiwal with regards to natural resource conservation.

## **1.5 Scope, adoption and revision of the plan**

This plan is intended to address all natural resource use within the State of Ngiwal with a specific management focus on existing legislated protected areas in the State. New regulations created through the development of this plan only apply to legislated protected areas. Management actions recommended through this plan for natural resources/areas outside of protected areas will be implemented only to the extent mandated by existing statutes of the state or new statutes to be established to support such actions.

This plan will have been formally adopted when it has been approved by the Keluluul a Kiuluul (Ngiwal State Legislature) through a resolution.

All aspects of this plan will be reviewed and revised, if necessary, within 5 years to meet improvement and requirements of the protected areas management in the State. However, as management of natural resources is an adaptive process and therefore Ngiwal State will review the plan annually to ensure that it is still up to date with the implementation of the plan.

## **1.6 Roles and responsibilities of relevant stakeholders**

1. Keluluul a Kiuluul – The Legislature will be responsible for conducting public hearing to address public concerns prior to approval of the plan through a resolution. The legislature is responsible for passage of required legislation to provide authority for specific management actions as provided by the plan, which has no existing legal authority within the State
2. Governor – Ngiwal State Governor will be responsible for implementation, review, necessary revisions, and conflicts arising from the plan.
3. Traditional leaders – The 10 rankings Chiefs of Ngiwal are members of the legislature and will exercise their authority through the legislative process. In addition, all traditional chiefs will be responsible for imposition of “bul”, where

necessary to support the management approach as recommended in the management plan.

4. Ngiwal Community Groups (men and women). The Ngiwal community groups will be involved in the review and to provide inputs to the plan. The groups, where applicable will be involved in conservation programs that results from the management plan.
5. Oselkesol Waterfall and Ngerbekuu Nature Reserve Board. The board will be responsible for providing advise to the Governor on implementation of the management plan within the Nature Reserve. The Board will also be responsible for providing education and awareness for management of the Nature Reserve. *(It is recommended that this Board becomes the Ngiwal Conservation Board, which will be responsible for all conservation natural resource related policies and activities)*
6. Kiuluul Economic and Development Authority (KEDA). The authority has oversight on any sustainable development that will take place in the Nature Reserve.
7. Ngiwal Public Land Authority. The PLA will be responsible for identification and approval of additional areas for conservation to augment the management of natural resource in Ngiwal.
8. National Government Agencies. KAK Bill No. 13-1S-002 authorized the Ministry of Justice and Ministry of Natural Resource, Environment, and Tourism to enforce restrictions within the Oselkesol Waterfall and Ngerbekuu Nature Reserve. Protected Areas Network Office. The Office will have oversight on the implementation of funding from the PAN Office to support the management of the Nature Reserve as a PAN site. The Office will also be involved in evaluating effectiveness of the management of the Reserve.
9. BWA Technical Committee (PCS, EQPB, PICRC, BNM, BoA, PALARIS). The committee members may be involved in the evaluation and revision of the management plan at the request of Ngiwal State and providing technical assistance.

## **1.7 Conflict Resolution**

Conflicts that may arise from the implementation of this plan will be resolved by the Governor's Office in consultation with relevant entities/stakeholders through a mechanism that is deemed culturally and legally appropriate by all. Conflict arising from the incompatibility of the contents of this plan with any national or state plans will require a revision to the specific section/s of this plan. Such revisions will be similarly adopted and incorporated.

## **2 Site Description**

### **2.1 Physical description**

Ngiwal State is located along the north eastern shoreline of Babeldaob. The State has a relatively small flat land area of less than 30% slope, which accounts for only 30% of the whole State land area. Main residential areas are on this flat slope along the coastline in the villages of Ngercheluuk and Ngermechau. The main State's infrastructure (school, state office, and docks are located in the village of Ngermechau. The village of Ngercheluuk supports majority of subsistence agriculture activity within the State. Much of Ngiwal farmable land (69%) can support agroforestry while only 2% is suitable for agriculture.

Ngiwal's topography is mainly steep slope of greater than 30%, which accounts for 70% of the State land area. This steep land area forms much of Ngerbekuu Watershed, which also includes areas in the jurisdiction of Melekeok to the south and Ngaraard to the north of Ngiwal State. The watershed drains into the Ngerbekuu River System that flows into Ngemai Bay, a mangrove fringe bay at the south end of Ngiwal State.

A recently reconstructed causeway, part of the Compact Ring Road, connects the south end of Ngiwal, Imekang, to the north end of Melekeok State. The Compact Road cuts through eastern edges of the Ngerbekuu Watershed through the savannahs. The Ngiwal

State road connects the Compact Road at Imekang. The State road runs along the coastline, just a few meters from the high tidal water mark, and connects Imekang at the south through the main villages to Ongiil at the north, bordering Ngiwal and Ngararrd State. Like most States in Babeldaod, Ngiwal has a public water system that is operated by the State under the Public Works Bureau of the National Government. This public water is supplied from two ground water wells that is supplemented with stream diverted water. Many individual homes rely on rooftop water for drinking water.

Unlike Koror, the whole of Babeldaob Island has no wastewater treatment, with exception of Melekeok State, which now has a small wastewater treatment facility that serves that National Capitol and the State of Melekeok. Wastewater in Ngiwal are contained within individual septic systems for each household, where available. Otherwise, toilet pits are still used by some residents.

Ngiwal has a solid waste (landfill) that meet EQPB requirements and may be improved in the future using the Fukuoka Concept or Aerobic concept. The State collects household trash at least twice a week.

Electric power to Ngiwal State is supplied through the national power grid operated under the Palau Public Utilities Corporation. Land line telephone, mobile and cable services are provided by the Palau National Communications Corporation.

## 2.2 Ngiwal Protected Areas

Protected Area = Conservation Area = Managed Area: can be defined as area with regulated activities for purpose of ensuring healthy and productive resource for future use

Ngiwal has two existing protected areas. The Ngemai Conservation Area established in 1997 through KAK Bill No. 7-004 for the purpose of recovery of depleted fish and invertebrates. Ngemai Conservation Area is a patch reef at the south end of Ngiwal State. The reef is fringed by corals at the edges around the reef, on the ocean side and

the side along the channels on the north and south, except the landward side where it is fringed by a stand of mangrove forest. The reef is mainly sandy bottom with sparse and patchy seagrasses. The reef gets exposed during low tides. Ngemai is historically known for the its abundant lbuchel (*Tripneustus gratilla*). However, this species has been depleted from the area.

***(Ngemai is considered as category 1a under IUCN, because it is strictly closed with limited visitation).***

The Oselkesol Waterfall and Ngerbekuu Nature Reserve established in 2008 through KAK Bill No. 13-1S-002 for the purpose of protecting the forest and to reduce soil erosion to ensure clean water for the people of Ngiwal. The watershed has an area of 1,056,890 m<sup>2</sup>. It is the smallest of the five major watershed in Babeldaob Island and is still relatively in pristine conditions.

***(The Nature Reserve is considered as category II under IUCN, because while it is a protected area there will be allowed permitted visitation and there are plans to provide necessary recreational infrastructures).***

### 2.3 Biophysical setting

Ngiwal's terrestrial area is still relatively intact. Upland forest accounts for 57% of the terrestrial area. The Ngerbekuu Watershed is still relatively forested, which account for majority of this upland forest, along the Babledoab middle ridge. Some patches of upland forest are found in the central area of Ngiwal with a sizable continuous patch on the north end of the State bordering the State of Ngaraard. Upland forest are not only important for reducing soil erosion and ensuring healthy rivers and streams but are also critical habitats for fauna that are associated with upland forest. One of the threatened bird species, the Micronesia pigeon, can be found in Ngiwal's upland forest.

Ngerbekuu River is an important freshwater source that has not been tapped into by the State, although the State has now tapped into one of its tributaries. The river is an important habitat for aquatic species.

Swamp forest accounts for the second largest vegetation type (15%) in Ngiwal. Swamp forest are found on the low lying areas of the Ngerbekuu watershed to the south of Ngiwal State and along the Ngerbekuu River. There are swamp areas that are found along the low lying areas of the State with close proximity to the shoreline. These are the swamp areas that are farmed as taro patch. Ngiwal's giant taro is regarded as one of the best in Palau.

Swamp forests are important habitats for birds, animals and plants. Swamp forests are also important areas for controlling river floods from damaging villages and for filtering sediment that results from soil erosion from degrading adjacent aquatic and marine habitats.

Mangrove forest plays similar role as swamp forest in filtering sediments from affecting coastal marine habitats. However, mangrove can only traps so much sediment and excessive soil erosion may affect ability of mangrove to trap sediment from affecting the marine habitats.

Mangroves in Ngiwal account for 9% of vegetation. They are important nursery area as well as habitat for mangrove crabs and mud crabs. People in Ngiwal market these two species to supplement their income.

Ngiwal has a small shallow marine habitats due to its location on the narrowest strip of fringing reef on the eastern reef system. Ngiwal has a lagoon area of 12.1 km<sup>2</sup>. Much of the lagoon is shallow and gets exposed during low tide. The lagoon area has seagrass beds that are important spawning area for rabbit fish and sea urchins. Ngemai reef is traditionally known for its abundance of sea urchin. However, harvesting activity caused drastic decline of this species which led the State to close the reef in 1997 in hopes of increasing sea urchin abundance. While sea urchins did not increase dramatically, fish

abundance did increase. However, in 2002 the fishing restrictions as called for in KAK Bill No. 7-004 lapsed due to failure to draft a management plan resulting in fishing pressure that has caused a decline in fish abundance.

Ngiwal has a very small and narrow fringing reef system that is only 5.6 km<sup>2</sup>. The reef is mainly barren at shallow depth above 5 m due to strong wave exposure generated by the prevailing easterly winds. While the reef is small, it still supports a good abundance of fish, such as chum, teboteb, etc. that the community relies on for subsistence as well as artisanal fishery. However, due to increase and unregulated use, the fish abundance is continually decreasing.

#### **2.4 Socioeconomic setting**

Ngiwal has a population base of only 209 people (2005 Census). It has a land area of just over 4,000 acres of which 70% has a slope of greater than 30%. Only 2% of Ngiwal's land is suitable for agriculture, while 69% can support agroforestry. Ngiwal has a relatively small reef area that support artisanal fishery.

Historically, people depended on their surrounding for daily living. With the introduction of cash economy after the WWII, people are now dependent on the cash economy for daily living. Government was the main employer and people migrated from Ngiwal to Koror for employment prior to the daily commute as a result of the completion of the compact Road. Many families established their residences in Koror and occasionally travelled back to tend to their properties, and as a result many taro patches and agroforest were abandoned. However, as world economy worsened driving the prices of goods and services up, people began to depend on the natural resource again to supplement their income. Because of limited time to tend to their properties, many people began to utilize foreign laborers for farming and fishing. This practice introduced new ways of farming and many traditional farming practices has been abandoned. This has created both social, economic, and environmental issues.

Today, there is still very limited employment and economic development in the State and many people still live or work in Koror. Ngiwal State is the main employer for Ngiwal people who live in the State. Any small business in Ngiwal State mostly employ foreign workers.

Ngiwal State along with its people have tried some economic development projects in the State to try to improve its economy to benefit the people of Ngiwal. The Ngirngemelas Square in Ngercheluuk was established to attract visitors. There is now a small cattle ranch being developed by Ngiwal State Government in collaboration with the people of Ngiwal. The Imekang Dock is being improved and expanded in hopes of starting new tourist and business activity within Ngiwal State. Ngiwal State is one of the designated area for Aquaculture (RPPL No. 6-42). Ngiwal State is proposing Ngemai Bay as a site for aquaculture project.

## **2.5 Key management targets ( targets are ranked according to their viability (health status) by people of Ngiwal using CAP workbook)**

1. **Forest (Good)**. This target include the upland forest, the riverine forest, lowland forest, and the associated birds that use the forest has habitat
2. **Cultural Sites & Historical Sites (Good)**. Cultural and historical sites are areas that have significant values to the community and are being preserved, which can also be a base for tourism development in the community.
3. **Rivers, Streams & Waterfall (Good)**. This target includes all rivers, stream, and the waterfall. The Ngerbekuu River is one of the five major rivers in Babeldaob.
4. **Swamp &Wetland (taro patch) (Fair)**. While wetland is an area which soil is saturated with moisture and includes many areas in Ngiwal, this target is focused on taro patch. Taro are important staples in the village as well as a source of income for women who live in the village and are not employed by the State Government.
5. **Mangrove System (forest, mud clam, mangrove crab) (Fair)**.This target includes the commercially valuable species that inhabit the mangrove area, such as mud

clam and mangrove crab. Mangroves are important ecosystems as they protect shorelines from erosion as well as provide habitat and nursery for variety of marine species.

6. **Fish (Fair)**. This target includes the fish species that are harvested for subsistence and commercial purposes. The species of fish includes but not limited to parrotfish, unicornfish, rabbitfish, rudderfish, wrasses, surgeonfish, etc.
7. **Beach & Stand (Fair)**. This target includes the beach and the vegetation along the sandy coastline.
8. **Coral Reef System (Poor)**. Ngiwal has a fringing reef system that is about 5.8 km<sup>2</sup> and a lagoon that is 12.1 km<sup>2</sup>. Ngiwal has one of the smallest reef area in the east coast of Babeldaob, yet still regarded as a productive reef system. The Meduu Ribtal is a submerged reef at the south end of the Ngiwal reef system, which according to a legend was a village with a breadfruit tree that provided fish for the village.
9. **Invertebrates (sea urchins, sea cucumbers, and clams) (Poor)**. This target includes all species of sea cucumber that are harvested for subsistence and commercial purposes. The Ngemai inner reef flat is well known habitat for sea urchin (lbuchel), however, abundance of sea urchin in this area has declined drastically due to overharvesting.

## 2.6 Threats to conservation (threats are ranked according to threat level by people of Ngiwal using the CAP workbook)

1. **Climate Change (Very High)**. The threat of sea level rise and unpredicted weather conditions that cause high wave actions that result from the overall effects of climate change is the highest concern for the people of Ngiwal. People live along the low lying coast of Ngiwal State where sea level rise and wave can affect their properties, houses, farms, and taro patches.
2. **Dredging (High)**. Dredging along the coast is view as a high threat because it removes important reef areas but also affect current circulation that contributes

to coastline erosion. This threat will exacerbate the effect of sea level rise on coastal communities in Ngiwal.

3. **Sedimentation (High)**. Sedimentation resulting from road construction, farming activities, and land clearing is a concern to the people of Ngiwal. This threat affects the health of the reef systems, which affects the fish and invertebrate resources the communities relies upon for daily sustenance and also as a source of income.
4. **Overharvesting (High)**. This threat is identified as mainly affecting the fish, sea cucumber, sea urchins, mangrove crabs, and mud clams. The threat of overharvesting is a result of both subsistence harvesting and commercial harvesting.
5. **Coastline modification (High)**. Alteration of the coastline due to impact from dredging and rising sea level is a threat to the people of Ngiwal. This will expose properties, farms, and taro patch to sea level rise. This further affects the potential development activities to improve livelihood in the community.
6. **Sand mining (Medium)**. The threat from mining sand from the beach is perceived to affect the coastline and possibly further altering the water flow, which may cause further coastline erosion.
7. **Lack of traditional restoration practices (Medium)**. Traditionally, Ngiwal people used to remove debris and overgrowth in the rivers, streams, and mangroves to help restore adequate water flow to maintain a healthy aquatic systems. That practices has eroded because of modern democratic system, which place many of that responsibility in the hands of the State Government. With limited resource, the State Government is not able to do what communities have traditionally been doing to maintain healthy communities and healthy ecosystems, resulting in many of the problems we face today.
8. **Boating Activities (Medium)**. The threat of boating activity is perceived to damage habitat as well as contribute to oil/fuel pollution that affect the health

of many marine organisms. This threat is believed to be contributing to further decline in fish and invertebrates as it may affect their life cycle and reproduction.

### 3 Management approach

There are already existing national statutes governing natural resource use that Nigwal State can simply adopt/enforce within the State. Nigwal State may need to enact legislation and promulgate regulations that will address specific natural resource use and conservation. This plan is intended to provide recommendation on use and conservation of natural resource based on management zones and species restrictions.

The implementation of this plan will require financial resources and capacity building to support enforcement. Nigwal may at its discretion may establish a monitoring program within the State and/or conduct monitoring in collaboration with a relevant government agency or a Non Government Organization involved in conservation.

#### 3.1 Vision statement

##### Vision

**The people of Nigwal State want to improve their livelihood through sustainable developments (including promotion of eco-tourism) and conservation of its natural resources to ensure healthy communities and ecosystems for future generations.**

### 3.2 Management Goals and objectives

Overall Goal: Effective management of Ngiwal’s natural resources through sustainable use and development for continued benefits to Ngiwal people at present and for future generation.

Goal 1. Effectively manage activities within the protected areas to improve biodiversity and livelihood of Ngiwal people by 2015.

Objective 1. Create guidelines for allowable activities that can take place within the protected areas within 1 year of implementation of this plan. (**Indicator:** Guidelines completed & approved)

Objective 2. Establish necessary infrastructures within the legal authority (NSPL No. 13-2/KAK Bill no. 13-1S-002) to support allowable recreational activities within the protected areas within 1 year of implementation of this plan. (**Indicator:** Waiting house, toilets and dock constructed in designated areas within the Nature Reserve)

Goal 2. Effectively manage activities outside of protected areas to reduce the threat of overharvesting and sedimentation on common natural resources within the State of Ngiwal territory by 2015.

Objective 1. Establish mirror legislations that are complimentary to National regulations on fish, invertebrates, and birds to allow for State to enforce such regulations within 1 year of implementation of this plan. (**Indicator:** Established State regulations concerning protected species ( as referenced in the Palau Marine Protection Act of 1994)

Objective 2. Establish buffer zones around major water bodies to help reduce impact of soil erosion on aquatic habitat by 2012. (**Indicator:** Buffer zone regulations established and enforced)

Objective 3. Establish regulations on commercial farming within the State of Ngiwal by 2012. (**Indicator:** Commercial farming regulations established and enforced): ***Ngiwal State needs to define commercial farming through regulations.***

**Goal 3. Establish effective conservation enforcement program in Ngiwal State by 2015.**

Objective 1. Conduct outreach and awareness program within Ngiwal State regarding the management of Ngiwal's natural resources within 6 months of the implementation of this plan. (**Indicator:** >50% of Ngiwal citizen support management actions)

Objective 2. Delineate all regulated areas in Ngiwal with proper markers by 2011. (**Indicator:** All regulated areas in Ngiwal properly marked)

Objective 3. Establish effective enforcement program in Ngiwal State within 1 year of implementation of this plan. (**Indicator:** State enforcement program established and functioning)

Effective enforcement program is defined as program with properly trained enforcement staff with legal authority and necessary equipment and supplies to implement enforcement operational plan).

Objective 4. Strengthening enforcement of protected areas and regulations addressing natural resource use by 2015. (**Indicator:** Decrease in number of poaching)

**Goal 4. Create sustainable developments in Ngiwal State to improve livelihood by 2015.**

Objective 1. Implement existing State aquaculture project plan by 2014. (**Indicator:** Aquaculture project in operation)

Objective 2. Develop a marketing plan for Ngiwal State tourist attractions incorporating cultural sites, protected areas, and other attractions in Ngiwal State by 2012. (**Indicator:** # of tourist visitors to Ngiwal)

**Goal 5. Building resilient Ngiwal community to adopt to sea level rise by 2015.**

Objective 1. Secure assistance to conduct vulnerability assessment of Ngiwal coastline to sea level rise by 2013. (**Indicator:** Vulnerability assessment report with recommendations)

Objective 2. Provide awareness materials to Ngiwal people regarding impact of climate change on sea level rise and potential impact on low lying coastal communities by 2011. (**Indicator:** >50% of Ngiwal citizen understand impact of sea level rise to them)

Objective 3. Establish guidelines based on recommendations from Objective 1 for housing and other potential developments activities along Ngiwal coastline by 2015.

(**Indicator:** Number of developments that incorporate ecosystem based adaptation)

Ecosystem-based adaptation includes a range of local and landscape scale strategies for managing ecosystems to increase resilience and maintain essential ecosystem services and reduce the vulnerability of people, their livelihoods and nature in the face of climate change.

### 3.3 Zoning and Regulations

The endorsement of this plan will put into place a new system of resource management zones and accompanying regulations. This system, along with existing national and state statutes and regulations, will form a management framework with which the state will support the goals and the objectives of this plan. Like all aspects of this plan, these zones and regulations will be subject for review and possible revision in 5 years.

The designations are not intended to be land use zones, but merely indicative of the special management requirements of the areas. These zones and regulations are not intended to take away from or hinder traditional management authority as it is understood by the people of Ngiwal and recognized by the state government.

### 3.4 Resource management zones

Ngiwal State has currently only 3 types of management zones. The main one is the general use zone, which includes both marine and terrestrial areas, while the Oselkesol Waterfall and Ngerbekuu River Nature Reserve is classified as conservation zone; the Ngiwal sea water is open for fishing with exceptions of net fishing and commercial fishing by foreign licensee or partnership. There are existing National Regulations that govern certain marine and terrestrial species that are applicable to Ngiwal Sate, referred as Protected Species. Table 2 describes these different zones and their characteristics.

<b>General Use</b>	General Use Zone includes all marine and terrestrial areas within the jurisdiction of the state of Ngiwal not otherwise covered by any of the following zones. No new regulations promulgated through this management plan apply to this particular zone; however, all pre-existing national and state statutes and regulations remain in effect.
<b>Conservation Zone</b>	KAK Bill No. 7-004 established the Ngemai Conservation Area which prohibited all types of fishing, hunting, cutting or removing and live or dead plants, removing soil, sand, rocks, coral, or any mineral.  KAK Bill 13-2S-002 states that Oselkesol waterfall/Ngerbekuu River and adjacent watershed lands have highly erodible soil that should be properly maintained and not be cleared of forest cover or used for destructive land activities.
<b>Open access area with restrictions</b>	KAK Bill No. 13-4R-007 section 5 prohibits use of explosives for fishing, commercial fishing by foreign licensee or foreign partnership, fishing with any form of compressed air, fishing for <i>semum</i> during closed season, and all type of net fishing in Ngiwal reefs.

<b>Cattle ranching zone (proposed)</b>	In this designated zone, Ngiwal State needs to create guidelines for (1)proper manure management – storage, handling and utilization to minimize impacts to water sources,(2) proper livestock yard management (2) Proper pasture management (3)alternative watering sources -- limiting direct animal access to water resources (streams, ponds, wetlands, wells, etc.)
<b>Aquaculture zone</b> <b>KAK Bill No:13-3R-005</b> <b>NSPL No.13-5</b>	It is highly recommended that the site in Ngemai Bay that has been identified for Aquaculture be the only site in Ngiwal State and no additional site to be designated. It is recommended that Ngiwal strongly consider aquaculture best management practices and to create State guideline for implanting its aquaculture project. No non-native species should be cultured in Ngiwal State.
<b>Buffer zone (proposed)</b>	Neutral area, where no clearing activity is allowed, between any land activity and body of water (size to be define by Ngiwal State)
<b>Residential Zone</b>	Ngiwal State needs to consider plans and guidelines for providing required infrastructure to support residential development, such as road, electricity, water, sewage system, and solid waste disposal.
<b>Nationally Protected Species</b>	<b>No extraction:</b> Humphead wrase (maml), Humphead parrotfish (kemedukl), Micronesia Pigeon (Belochel) <b>Seasonal closure:</b> Rabbitfish (meas), grouper (temekai, tiau), turtles (ngasech & melob), trochus (semum)  <b>Minimum size for harvest:</b> Mangrove crab (emang), lobster (cherabruk)

Table 2. Suggested Ngiwal natural resource use & management zones.

### 3.5 Summary of allowable and prohibited activities

#### Ngiwal Protected Areas allowable activities:

- ✓ Enforcement: Entry into the Conservation Area for enforcement purposes is allowed at any time without a permit, provided it is done by authorized State or National Law Enforcement officers.
- ✓ Research: Research that will increase the understanding of the special significance of the Oselkesol Water, Ngerbeuu Nature Reserve, and Ngemai Conservation Area should be encouraged and should follow established guidelines.
- ✓ Monitoring and Evaluation: Monitoring of the Protected Areas and program will be permitted in order to evaluate the status of resources and the effectiveness of management activities to demonstrate progress towards meeting the area's management objectives. Permits for such activities are to be issued by the Governor.
- ✓ Restoration of Natural Resources: Restoration of Natural Resource is any activity necessary to restore populations of natural resources to sustainable levels, and can include such activities seeding or planting. Such activity will only be permitted after getting approval from the State Legislature, Traditional leaders, and the Governor. A cost benefit analysis must be conducted prior to approval of such activities.
- ✓ Educational and Awareness: Visits to the Ngiwal Protected Areas for educational and awareness building for such groups as community groups, students, tourists, and visiting guests is encouraged. A permit for proposed visits must be issued prior to visitation of the site. A Conservation Officer or representative from the office of the Governor must accompany all groups.
- ✓ Tourism: Tourism compatible with the overall management goal and objectives of the Protected Areas will be allowed. These mainly include diving, snorkeling, and/or photography and will be allowed within the conservation area in designated zones. Visitation permits must be obtained prior to entry. Tourism guidelines will be produced that further describe allowable activities, behavior, and tourism zones within the Conservation Area.

- ✓ Special Entry: Special entry into the area would be decided and approved by the Office of the Governor. These entries may include visitation by community groups, local residents, donor visits, and special guests on a case by case basis.
- ✓ Emergency Response: Entry into the Protected Areas will be allowed for Emergency Response Entry for special circumstances such as search and rescue, removal and salvage of wrecks, and pollution control (including spill control and trash clean-ups) may be approved by the Governor's Office.
- ✓ Innocent Passage: Innocent passage through the Protected Areas will be allowed in times of distress or when necessary in foul weather conditions without a permit as long as no fishing or any other activity not having a direct bearing on passage occurs.
- ✓ Sustainable developments: Visitor infrastructures (such as toilets & waiting house) will be permitted through the Governor's Office. Such activity will only be permitted within the Oselkesol Waterfall and Ngerbekuu Nature Reserve. Aquaculture is permitted only in the designated zone in the Ngemai Bay and may not encroach into the protected mangroves or the Ngemai Conservation Area.

### **3.6 Restricted Activities within and outside of Protected Areas:**

- ❖ Any activities not described above will be considered as an unpermitted activity within the confined of the Protected Areas and will be subject to fines as determined by Ngiwal State.
- ❖ Specific activities that are prohibited within the Ngemai Conservation Areas are: all types of fishing & hunting, cutting or removing any live or dead plants, removing soil, sand, rocks, coral, or any mineral.
- ❖ KAK Bill No. 13-4R-007 prohibits the following activities within Ngiwal State territorial waters: (1) commercial fishing without a permit from Ngiwal State, (2) non Palauan citizen engaged in fishing without permit, (3) fishing with explosives or other harmful substances, (4) commercial fishing within the reef by foreign licensee

or partnership, (5) all types of fishing using net, (6) receiving, buying, transporting, storing, using, eating, or selling any fish that were obtained in violation of KAK Bill No. 13-4R-007.

- ❖ EQPB Regulation Chapter 2401-1 Earthmoving Regulations prohibits any earthmoving activity without obtaining necessary permit from EQPB. (Earthmoving is defined as any construction or other activities which disturb or alter the surface of the land, coral reef or bottom of a lagoon, including but not limited to excavations, dredging, excavations, embankments, land reclamation, land development, moving, storing, and disposing of soil)
- ❖ Environmental Health Regulation Article 10 Section 1 & 2 prohibits any piggery within 200ft from any water source/bodies and further mandates best management practices for manure and piggery effluents.
- ❖ 27 PNCA 1204 prohibits fishing/harvesting of the following:

Species	Harvesting season	Minimum Size	Other restrictions
-Meteungerel temekai ( <i>Epinephelus fuscoguttatus</i> ), - Ksau temekai ( <i>Epinephelus polyphkadion</i> ), -Tiau ( <i>Plectropomus areolatus</i> & <i>Plectropomus leopardus</i> ), -Mokas, katuu tiau ( <i>Plectropomus laevis</i> )	Closed: April 1- July 31	NO	
Meyas ( <i>Siganus canaliculatus</i> )	Closed: February 1- March 31	No	
-Kemedukl ( <i>Bolbometopon muricatum</i> ) -Maml ( <i>Chelinus undulatus</i> )	Closed permanently	Closed permanently	No possession; no export
Bleached ( <i>Panulirus versicolor</i> ), -Raiklius ( <i>Panulirus penicillatus</i> ), -Melech ( <i>Panulirus longipes</i> )	Open	3.5 inches total length of carapace	No taking of egg bearing female; no export

<i>femoristriga</i> )			
Ketat (Birgus latro)	Open	4 inches across the carapace (shell)	No taking of egg bearing female; no export
Semum (Trochus niloticus)	Designated season by OEK	3 inches basal diameter	State Governments can designate closed areas during open season
Emang (mangrove crab)	Open	6 inches greatest distance across carapace	No taking of egg bearing female; no export

Table 3 . List of protected species as identified in the Palau Marine Protection Act.

### 3.7 Summary of relevant state and national legislation and regulations

<b>State Legislation and Regulations</b>		
<b>Reference</b>	<b>Purpose</b>	<b>Year</b>
KAK Bill No. 13-4R-007 NSPL No. 13-7	To protect and conserve the limited marine resources within and surrounding the State of Ngiwal.	2010
KAK Bill No. 13-3R-005-NSPL No.13-5	To designate aquaculture area in Ngiwal	2009
KAK Bill No. 13-4R-007	To protect and conserve the limited marine resources within and surrounding the State of Ngiwal.	2009
KA Resolution No. 12-40	Defining the boundaries of the proposed PAN site along the river	2008
NSPL no.: 13-2/KAK Bill no. 13-1S-002	Establishing the Olsolkesol Waterfall and Ngerbekuu River Nature Reserve	2008
NSPL 7-004	Establishing Ngemai Conservation Area	1997
<b>National Legislation and Regulations</b>		
<b>Reference</b>	<b>Purpose</b>	<b>Year</b>
RPPL No. 4-18 as amended by RPPL No. 4-35	Marine Protection Act	1994
RPPL No. 4-35	Amendment Marine Protection Act	1995
RPPL No. 6-17	Increased penalties for killing of marine life by	2002

	stunning, poison, or explosives.....	
RPPL No. 6-28	Penalties for illegal taking, possessing, or exporting dugongs....	2001
RPPL No. 6-36	Prohibition of foreign fishing vessels within 50 nautical miles....	2003
RPPL No. 6-39	Protected Areas Network Act	2004
RPPL No. 6-42	Tax incentives for ventures in agriculture, mari-culture or aquaculture	2003
RPPL no. 7-17	To ban bottom trawling in the Republic of Palau territorial waters....	2006

Table 4: Summary of Ngiwal State and National Conservation related Legislations.

### 3.8 Fees and penalties

A structure of fees and penalties for all activities within this management plan will be developed by the Oselkesol Waterfall/Ngerbekuu Nature Reserve within one year of the endorsement of this plan to include all other fees as called for in various Ngiwal State Legislations concerning management and uses of natural & cultural resources.

### 3.9 Financing plan

- Protected Areas Network Office (PAN Site funding support)
- Ngiwal State Government (KAK Bill 13-1S-002 Section 6 (c) (3))

### 3.10 Operational budget

Annual Operational Budget				
Budget Category	Description	Units	Cost	Total
Staff	Protected Areas Manager @ \$12,000/yr	1	\$12,000	\$57,000
	Ranger @\$7000/yr	5	\$35,000	
	Office support staff @\$10,000	1	\$10,000	
General office expenses	Utilities, communication services, and office supplies	1	\$7,000	\$7,000
Education and	Development and dissemination of education and promotion materials	1	\$3,000	\$11,000

community relations	Community meetings, hosting of student and community groups etc.	1	\$8,000	
Enforcement & monitoring	Fuel (Car & boat)	1	\$10,000	\$20,000
	Boat & car and vehicle maintenance	1	\$3,000	
	Supplies	1	\$5,000	
	Enforcement training (on-island)	1	\$2,000	
Miscellaneous	Travel (Off-island Training)	1	\$4,000	\$5,000
	Annual program evaluation, reporting, and work planning	1	\$1,000	
	Research, drafting, review, and approval of necessary regulations to support management	1	\$10,000	\$10,000
<b>Total Operational Cost</b>				<b>\$110,000</b>
<b>Initial Program Inputs: Capital Items, Infrastructure, and Planning</b>				
Office equipment	Computer & printer	1	\$3,000	\$3,800
	Projector	1	\$800	
Monitoring and enforcement equipment	Vehicle (4 x 4 pick up truck)	2	25,000	\$35,000
	Boat ( small for marine enforcement)	2	\$10,000	
Site Delineation	Buoys, markers, and installation	1	\$5,000	\$5,000
	Site preparation and construction of visitors center	1	\$30,000	\$60,000
	Vulnerability assessment on Ngiwal Coastal area to sea level rise	1	\$30,000	
<b>Total Initial Program Input</b>				<b>\$103,800</b>
<b>GRAND TOTAL</b>				<b>\$213,800</b>

**Table 5.** Proposed annual operating budget for the management of Ngiwal’s Protected Area and natural resources, including required initial start up cost.

Budget Justification:

1. Site Manager @ \$12,000/year will be responsible for overall management of the site and the Conservation and Enforcement Program. The Site manager will coordinate all activities within the Protected Areas of Ngiwal State. Other responsibilities include but not limited to the following: preparation of annual operating plans and reporting, maintain and report project budgets, implement awareness program in collaboration with the Nature Reserve Board, create daily

- work schedule for project staff, recommend possible capacity building activities for the project staff, conduct annual program review.
2. \$10,000 is requested for an office support staff. The office support staff will provide administrative support to the site manager and the conservation and enforcement program.
  3. Ranger at \$7,000/year x 5 = \$35,000. At minimum five rangers will be needed to implement the initial enforcement need for the project. For safety reason, there should be at least two rangers on patrol at all time when surveillance is conducted. There will be at least two rotational shifts for surveillance. The fifth person will be based in the project office for administrative support for the Conservation and Enforcement Program at night time. The rangers will perform but not limited to the following: undertake and execute overall management activities, conduct surveillance and law enforcement activities, accompany and guide visitors to the Protected Areas, assist with awareness and monitoring activities, operate surveillance equipments, maintain journal of daily activities and events.
  4. \$7,000 annually is allocated so support administration of the plan (general office supplies, communications, and utilities).
  5. \$11,000 is allocated to support awareness programs, such as printing awareness materials, signage, and meetings. (During this first year implementation, focus of awareness is on the purpose of managing Ngiwal's natural resource to include providing awareness on relevant legislation and regulations governing Ngiwal's resources; necessary signage will be place at strategic locations to provide awareness of regulated areas, etc.)
  6. \$20,000 is requested annually to support enforcement of regulations within Protected Areas and other designated areas in Ngiwal to support management of Ngiwal's natural resources. This amount includes training for enforcement staff, supplies, fuel, and maintenance of equipments.
  7. \$4,000 is requested for off-island training of conservation officers (at least one officer/year) and annual work planning and evaluation.
  8. \$10,000 is requested to support research, drafting, and review of necessary regulations and guidelines to support management activities. The funds may cover consultancy, meetings, and legal review of regulations.
  9. A total of \$103,000 is required as initial set up cost to support enforcement and sustainable tourist attractions in the protected areas. Specifically,
    - \$3,800 is requested for a laptop and printer to support office works and a projector, which will be used for awareness and community outreach. A laptop will serve the office administrative work as well as community outreach presentations.
    - To support enforcement, a 4 x 4 truck (\$25,000) is requested to conduct surveillance on land and a small boat (\$10,000) to support surveillance in Ngiwal's seawater. The truck can be used also to tow the boat.
    - \$5,000 is needed for purchase and installation of markers to designate specific use zones.

- \$30,000 will be required to construct a waiting house and necessary outhouse to support tourist visiting the Nature Reserve.
- It is estimated that at least \$30,000 will be needed for consulting to conduct vulnerability assessment of Ngiwal coastline to sea level rise.

### 3.11 Reporting (financial and programmatic)

An annual financial report detailing expenditures shall be prepared by the PAN Area Manager subject to State and National Government financial reporting guidelines as well as guidelines set forth by the Protected Area Network Office. In addition, a programmatic report detailing progress of each activity as outlined in annual work plan shall be prepared by the PAN Area Manager. These reports shall be made available to Ngiwal Governor, KAK, PAN Office, National Treasury of ROP, and OEK by September 31 of each year. At the request of any agency (government & NGO's), such reports should be made available.

## 4 Monitoring plan

**A monitoring plan will be developed by the Site Manager in collaboration with local resource management agencies and incorporated into this plan by the end of 2010.**

This monitoring plan will not only focus on biological or ecological indicators but will also gauge public support of this plan and the progress of its implementation. At minimum the monitoring plan should address but not limited to the following:

- Who is responsible for monitoring
- Methods for monitoring objective indicators (when)
- Methods monitoring status of conservation area (i.e sedimentation, fish & invertebrate abundance, forest canopy, etc)(when & where).
- Timeline for monitoring management effectiveness
- Budgetary requirements for implementing required monitoring activities

## 5 Enforcement plan

**Enforcement and surveillance operational plan will be developed by the Site Manager and Governor prior to establishing the Ngiwal Conservation and Enforcement Program**

**by June 2011.** The plan may be established in collaboration with appropriate agencies and partners as deemed appropriate by Ngiwal State. At minimum the plan should address but not limited to the following:

- Responsibilities for enforcement officers
- Procedures for citation
- Surveillance schedule
- Maintenance of regulated area markers
- Maintenance of enforcement equipments & supplies
- Training of enforcement officers

## 6 References

Atkinson, S., 2007. A Management Planning Guide for Marine Resource Managers. Palau workshop manual. 61pp.

Hinchley, D., Lipsett-Moore, G., Sheppard, S., Sengebau, U., Verheij, E and Austin S (2007). Biodiversity Planning for Palau's Protected Area Network: An Ecoregional Assessment. TNC Pacific Island Countries Report No. 1/07.

KAK Bill No. 7-004. To establish a system of Conservation Areas; to designate the Ngemai Conservation Area; to repeal NSPL No. 5-0012, and other related purposes.

KAK Bill No. 13-1S-002. Relating to the conservation and protection of the Olselkesol Waterfall watershed area in the State of Ngiwal, Republic of Palau.

KAK Bill No. 12-4R-007. To protect and conserve the limited marine resources within and surrounding the State of Ngiwal.

MWM Architects Inc. Guam and California. 2003. Resource Management Suitability Study for the States of the Republic of Palau. 441pp.

Republic of Palau 2005 Census Monograph.

Ngiwal State, 2009. Ngiwal State Conservation Action Plan. Report, 19pp.

Palau Marine Protection Act of 1994.

RPPL No. 6-39. Protected Areas Network Act.

RPPL No. 6-42. Tax incentives for the development of agriculture and aquaculture industries in Palau

## 7 Appendices

### 7.1 Tentative work plan for implementation of management objectives.

Goal 1. Effectively manage activities within the protected areas to improve biodiversity and livelihood of Ngiwal people by 2015.	Parties Responsible (*Lead)	Start – End Dates	Expected Outcome (Indicator)
Objective 1. Create guidelines for allowable activities that can take place within the protected areas within 1 year of implementation	*Nature Reserve Board and Governor	June 2010- April 2011	Guidelines completed & approved
Objective 2: Establish necessary infrastructures within the legal authority (NSPL No. 13-2/KAK Bill no. 13-1S-002) to support allowable recreational activities within the protected areas within 1 year of implementation of this plan.	*Governor, Nature Reserve Board, KEDA		Waiting house and toilets constructed in designated areas within the Nature Reserve
Goal 2. Effectively manage activities outside of protected areas to reduce the threat of overexploitation of common natural resources within the State of Ngiwal territory by 2015.	Parties Responsible (*Lead)	Start – End Dates	Expected Outcome (Indicator)
Objective 1. Establish mirror legislations that are complimentary to National regulations on fish, invertebrates, and birds to allow for State to enforce such regulations within 1 year of implementation of this plan.	*KAK & Governor	June 2010- June 2011	Established State regulations concerning protected species (as referenced in

Objective 2. Establish buffer zones around major water bodies to help reduce impact of soil erosion on aquatic habitat by 2012.	*Nature Reserve Board, Governor, NSPLA, KEDA, KAK,	January 2011 – January 2012	Buffer zone regulations established and enforced
Objective 3. Establish regulations on commercial farming within the State of Ngiwal by 2012.	Nature Reserve Board, Governor, NSPLA, KEDA, KAK	January 2011 – January 2012	Commercial farming regulations established and enforced
Goal 3. Establish effective conservation enforcement program in Ngiwal State by 2015.	<b>Parties Responsible (*Lead)</b>	<b>Start – End Dates</b>	<b>Expected Outcome (Indicator)</b>
Objective 1. Conduct outreach and awareness program within Ngiwal State regarding the management of Ngiwal’s natural resources within 6 months of the implementation of this plan.	*Nature Reserve Board	June 2010 – December 2010	>50% of Ngiwal citizen support management actions)
Objective 2. Delineate all regulated areas in Ngiwal with proper markers by end 2011.	*Ngiwal PAN Site Area Manager, Governor	January 2011 – December 2011	All regulated areas in Ngiwal properly marked
Objective 3. Establish effective enforcement program in Ngiwal State within 1 year of implementation of this plan.	*Ngiwal PAN Site Area Manager, Governor	June 2010 – June 2011	State enforcement program established and functioning
Objective 4. Strengthening enforcement of protected areas and regulations addressing natural resource use by 2012.	*Conservation Officers, Ngiwal PAN Site Area Manager, Governor	July 2011 - 2015	Decrease in number of poaching
Goal 4. Develop sustainable developments in Ngiwal State to improve livelihood by 2015.	<b>Parties Responsible (*Lead)</b>	<b>Start – End Dates</b>	<b>Expected Outcome (Indicator)</b>
Objective 1. Implement existing State aquaculture project plan by 2012.	Governor	Now until 2015	Aquaculture project in operation
Objective 2. Develop a marketing plan for Ngiwal State tourist attractions incorporating cultural sites, protected areas, and other attractions in Ngiwal State by 2012.	*Nature Reserve Board, Governor, KEDA, Beautification Committee	January 2012-June 2012	# of tourist visitors to Ngiwal
Goal 5. Building resilient Ngiwal community to adopt to sea level rise by 2015.	<b>Parties Responsible (*Lead)</b>	<b>Start – End Dates</b>	<b>Expected Outcome (Indicator)</b>

Objective 1. Secure assistance to conduct vulnerability assessment of Ngiwal coastline to sea level rise by 2013	*Governor, MNRET, other partners	June 2010 – December 2013	Vulnerability assessment report with recommendations
Objective 2. Provide awareness materials to Ngiwal people regarding impact of climate change on sea level rise and potential impact on low lying coastal communities by 2011.	Nature Reserve Board & partners	January 2011 – December 2011	>50% of Ngiwal citizen understand impact of sea level rise to them
Objective 3. Establish guidelines based on recommendations from Objective 1 for housing and other potential developments activities along Ngiwal coastline by 2015	*Governor, KEDA, NSPLA, KAK, MNRET, other partners	January 2014-April 2015	Number of developments that incorporate ecosystem based adaptation

## 7.2 Proposed FY11 annual work plan for implementation of management activities

EXPECTED OUTPUTS  <i>7.2.1.1</i>	PLANNED ACTIVITIES	TIMEFRAME				RESPONSIBLE PARTY	PLANNED BUDGET		
		Q1	Q2	Q3	Q4		Source of Funds	Budget Description	Amount
PAN Area Manager hired	Advertise & Hire PAN Area Manager	x				Governor	PAN	Salary	12,000
Office Assistant hired	Advertise and hire Office Assistant	x				Governor/PAN Area Manager	PAN	Salary	10,000
Office equipment	Purchase office equipments	x				PAN Area Manager	PAN	Capital items	\$3,800
Efficient administrative and enforcement support (utilities, office supplies, fuel, etc)	Procurement of necessary support for administration and enforcement & maintenance	x	x	x	x	Project Area Manager/Office Assistant	PAN	General Office expense	22000
PA activities guidelines completed & approved	<i>Establish visitors guidelines</i>		x			Nature Reserve Board, Governor, PAN Area	PAN	meetings/legal review	1000
	<i>Establish fee structure</i>		x			Nature Reserve Board, Governor, PAN Area Manager	PAN	Meetings/legal review	1000
	<i>Establish infrastructure guidelines</i>		x			Nature Reserve Board, Governor, PAN Area Manager	PAN	Meetings/legal review	1000

	<i>Other use guidelines (collection of medicinal plants, etc)</i>		x			Nature Reserve Board, Governor, PAN Area Manager	PAN	Meetings/legal review	1000
Waiting house, toilets and dock constructed in designated areas within the Nature Reserve	<i>Infrastructure design</i>	x	x			Governor	PAN	Misc.	2,000
	<i>Bidding</i>			x		Governor	PAN		
	<i>Construction</i>			x	x	Governor/PAN Area Manager	PAN	Construction	28,000
Established State regulations concerning protected species	<i>Drafting legislation</i>	x				KAK	PAN	Legal review	1500
	<i>Legislative process</i>	x	x			KAK			
>50% of Ngiwal citizen support management actions	<i>Preparation of presentations</i>	x				PAN Area Manager	PAN		
	<i>Community meeting/outreach</i>	x	x			PAN Area Manager, Nature Reserve Board	PAN	Meetings	3000
	<i>Community outreach to PA</i>		x	x	x	Conservation Officers	PAN	Meetings/outreach	2000
	<i>Put up signs for PA</i>	x	x			PAN Area Manager/Partners	PAN	Printing	2000
	<i>Create brochures and poster for Ngiwal PA &amp;</i>		x			PAN Area Manager/Partners	PAN	Printing	1000
	<i>Assessing community perception</i>				x	PAN area manager/partner	PAN	Meetings	2000
All regulated areas in Ngiwal properly marked	<i>Purchase buoys &amp; markers</i>		x			Office Assistant	PAN	Misc.	2500
	<i>Install buoys</i>				x	Conservation Officers	PAN	Supplies	2500
State enforcement program established and functioning	<i>Create Enforcement plan</i>	x				PAN Area Manager, Governor, & partners	PAN	meetings	1000
	<i>Hire 5 Conservation Officers</i>		x			PAN Area Manager/Partners	PAN	Salary	35,000
	<i>Train Conservation Officers</i>		x	x		PAN Area Manager	PAN	Training	6,000
	<i>Purchase enforcement equipments &amp; supplies</i>			x		Office Assistant /Conservation Officers	PAN	Equipments	40,000
	<i>Conduct surveillance</i>		x	x	x	Conservation Officers	PAN		
Monitoring plan	<i>Work with partners to draft a monitoring plan</i>				x	PAN Area Manager	PAN		
Visitor marketing plan (to be completed by end of 2012)	<i>Create a tourist attraction marketing plan that incorporate</i>				x	PAN Area Manager, Nature Reserve Board, Governor, KEDA,	PAN	Meetings	2000
Buffer zone regulations (to be completed by end of 2012)	<i>Gathering of information on buffer zone</i>				x	PAN Area Manager/Office assistant	PAN		
	<i>Initial discussion on buffer zone regulations</i>				x	PAN Area Manager/Partners	PAN	meetings	500

Commercial farming regulations (to be completed)	<i>Create guidelines for commercial farming</i>				x	PAN Area Manager/Partners	PAN		500
Annual program Review	<i>Conduct annual audit of progress of project</i>				x	PAN Area Manager/Governor &	PAN	meetings	500
Vulnerability Assessment Report (to be completed by 1/1/2013)	<i>Secure funding to conduct assessment</i>				x	PAN Area Manager	To be identified	Contractual	30,000
							Other	PAN	Total
							30,000	183,800	213,800

### 7.3 Proposed roles & responsibilities of key personnel for implementation of management plan

<b>Ngiwal State Government</b>
<p><b>Governor</b></p> <p><b>Role:</b> To oversee the management of the area by the State Government to ensure proper implementation of management efforts according to the plan.</p> <p><b>Responsibilities:</b></p> <ul style="list-style-type: none"> <li>• Oversee, in general, implementation of management plan</li> <li>• Design and Implement Permit System</li> <li>• Collect fees</li> <li>• Hire and oversee the PAN Area Manager</li> <li>• File incident reports with National Government</li> <li>• Communicate with National Government on general issues (finances, program or agency correspondence, etc)</li> <li>• Authorize to designate in writing officers that have the authority to patrol the area, issue citations and arrest suspected violations of the provisions in this plan.</li> <li>• Dispense and report on the use of funds according to approved budgets</li> <li>• Approve and sign applications/permits (which can be delegated at a later time to the manager)</li> <li>• Negotiate agreements with potential partners</li> </ul>
<p><b>State Treasurer</b></p> <p><b>Role:</b> Oversee the management of finances and maintain accurate financial records according to plan procedures.</p>

**Responsibilities:**

- Maintain financial records of expenditures of the Conservation and Enforcement Unit
- Review and approve purchase orders and other expenditures
- Provides financial reports to Manager and Governor

**PAN Area Manager**

**Role:** To oversee and report the day-to-day management activities of the area to ensure proper implementation of management efforts according to the plan.

**Responsibilities:**

- Responsible for overall management of the site and the Conservation Officers
- Coordinate all activities in the conservation area
- Create daily work schedule
- With Conservation Officers, enforce the rules and provisions of the management plan
- Establish and implement a Visitors Program for Ngjwal PAN Sites
- File incident reports with governor
- Ensure effective monitoring program is carried out
- Interact with community and other stakeholders (including neighboring states), including consultations and organizing necessary meetings.
- Prepare annual, quarterly and other required reports for the site and program
- Present reports to the governor, the assembly, broader community and other stakeholders on the status of and activities within area
- Implement awareness and education program, including dissemination materials and information
- Create job descriptions including responsibilities for Conservation Officers, including day-to-day schedule.
- Supervise program staff; conduct annual performance appraisals
- Maintain assets of the program, include maintenance of equipment and vehicles
- Create and maintain project budgets
- Recommend site management and enforcement unit level improvements to the Governor.
- Recommend possible partnership with other agencies, institutions, organizations, networks, or individuals.

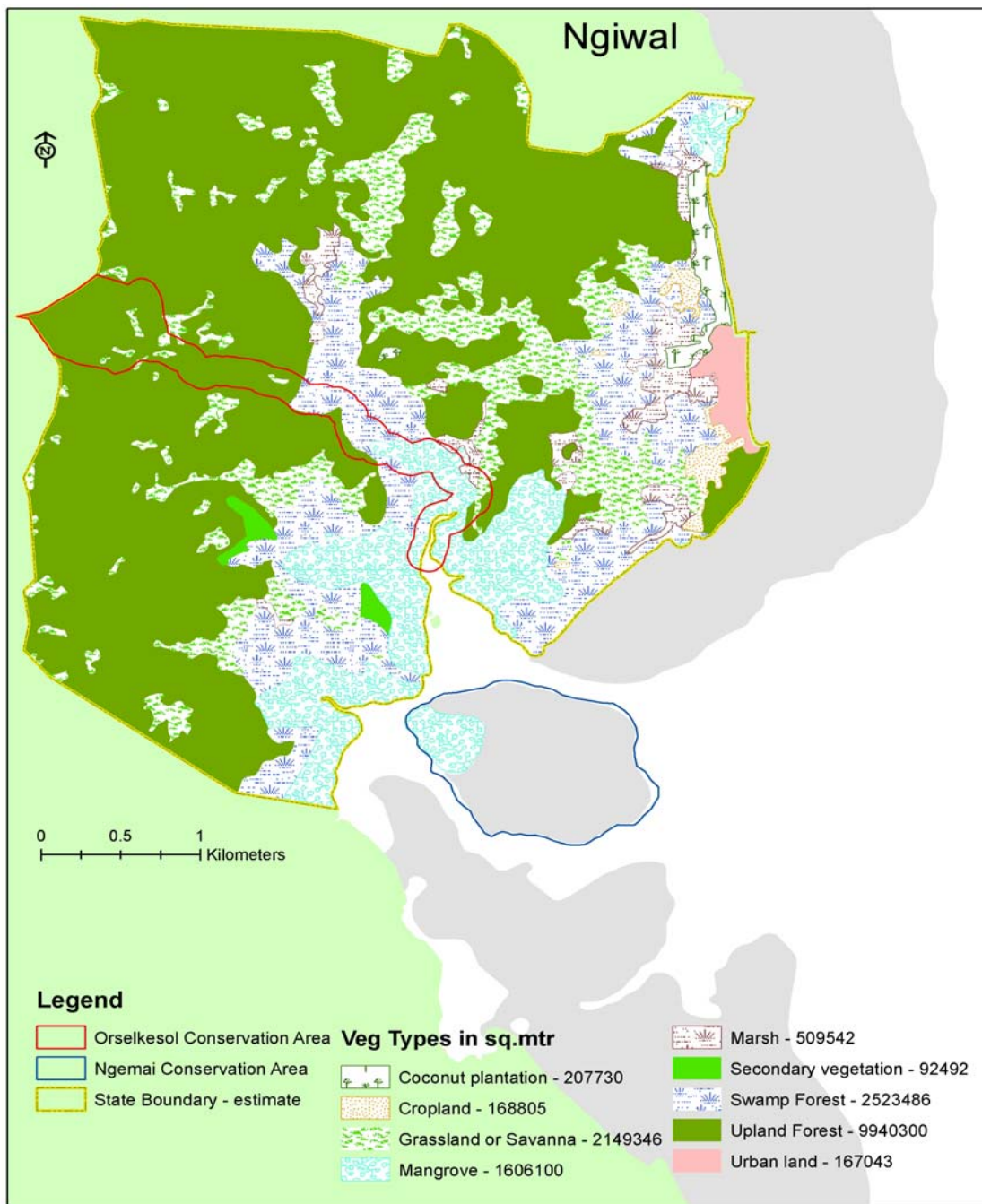
**Conservation Officers**

**Role:** Perform and report daily management tasks within the area to ensure proper implementation of management efforts according to the plan.

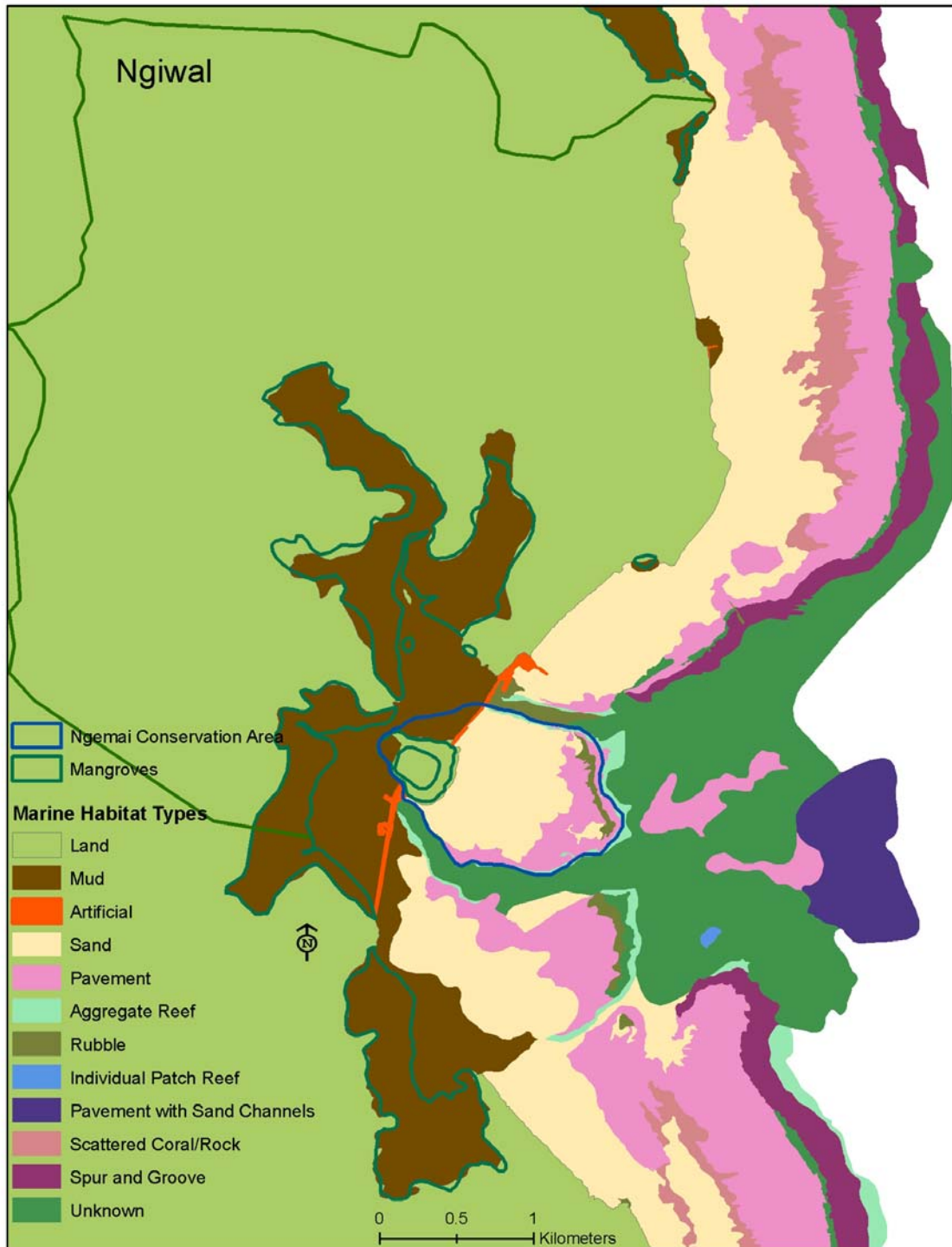
**Responsibilities:**

- Undertake and execute overall management activities
- Assist with program monitoring
- Conduct surveillance and law enforcement activities, including detaining suspected violators, issuing citations, informing people of laws and regulations,
- Accompany and guide visitors and tourists
- Conduct awareness activities
- Report to the manager on the status of activities and incidents
- Maintain daily journal of activities and events
- Operate and maintain equipment and property (such as boats, engines, radios, buoys, signs, etc.)

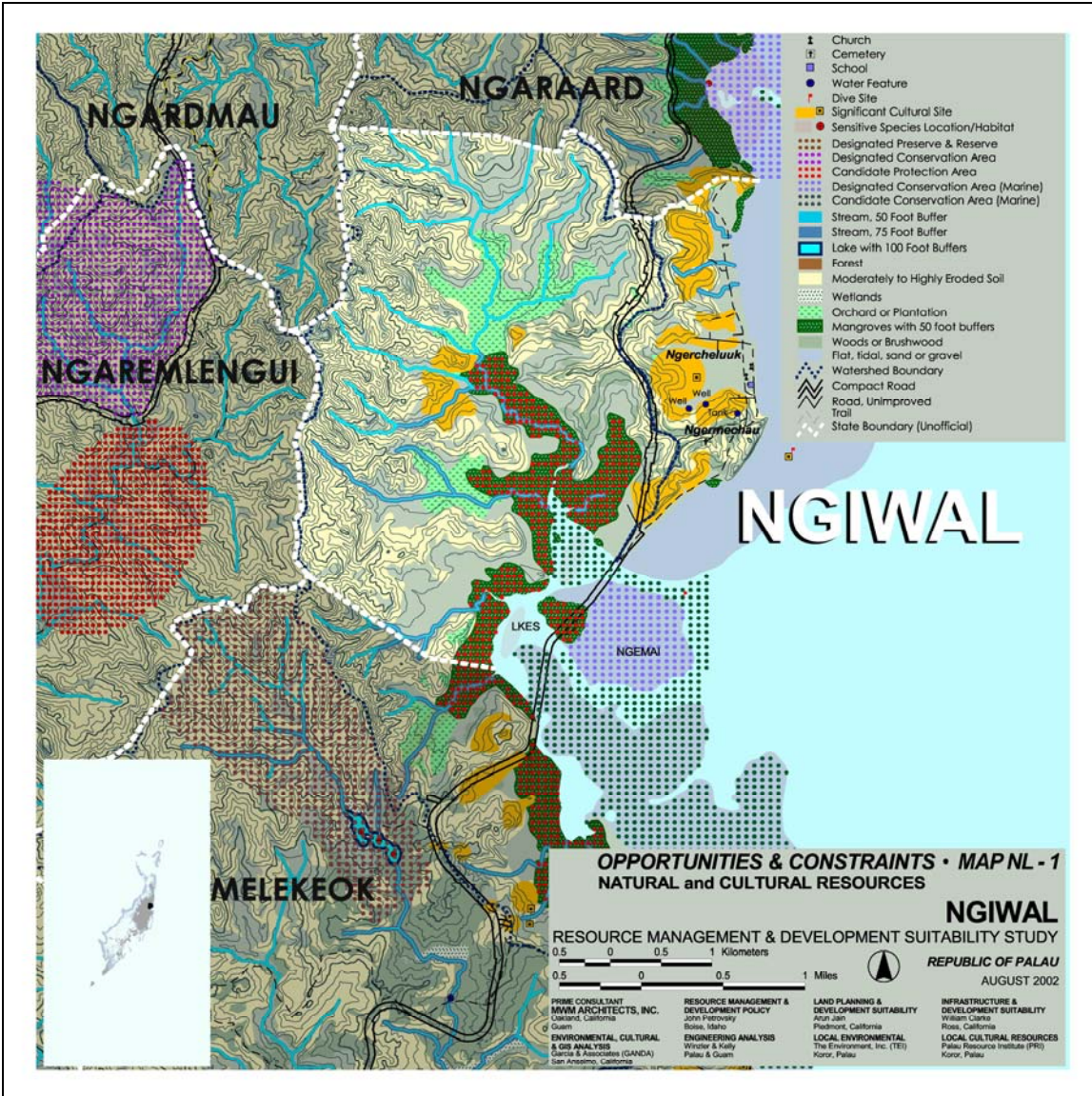
7.4 Vegetation map of Ngiwal. Numbers next to category are size in m<sup>2</sup>. Red line indicate boundary of Orselkesol Waterfall and Ngerbekuu Nature Reserve; blue line indicate boundary for Nge mai Conservation Area.



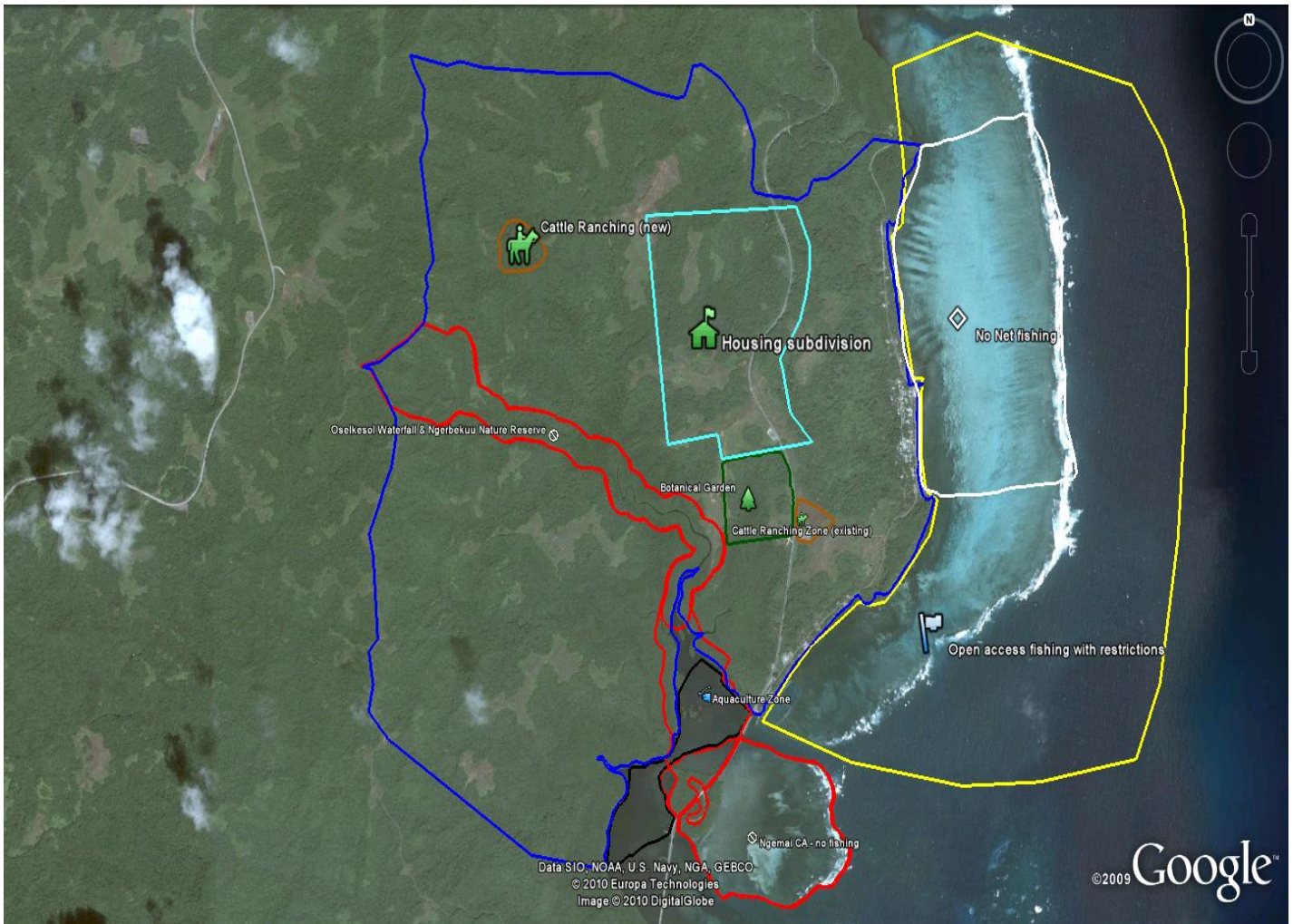
7.5 Ngiwal shallow water marine habitat maps showing major reef structures.



7.6 Natural and cultural resources map for Ngiwal state. (Source: Resource management and development suitability study.)



7.7 Suggested management zones for Ngiwal State with allowable and restricted activities (table below). Red lines indicates Protected Areas (closed area with permitted access). Black line indicate aquaculture zone. Brown line indicates cattle ranching zone. Yellow line indicates open access fishing (permitted commercial fishing; no fishing with nets (within white line); no fishing with explosives; no fishing with compressed air; no foreign commercial licensee or partnership fishing allowed). Green line is the botanical garden. Light blue line is the proposed new residential area. Blue line indicates Ngiwal State boundary (approximated unofficial boundary).



Site	Allowable activities	Restricted Activities
Oselkesol Waterfall & Ngerbekuu Nature Reserve (Open entry with permitted use)	<ul style="list-style-type: none"> <li>✓ Harvesting of plants for medicinal purpose</li> <li>✓ Tourist infrastructure (waiting house , toilet, trail)</li> <li>✓ Permitted visitation</li> <li>✓ Enforcement activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ No cutting trees, burning, hunting, farming, other activities not permitted</li> </ul>
Ngemai Conservation Area (Closed with permitted visitation)	<ul style="list-style-type: none"> <li>✓ Permitted entry</li> <li>✓ Enforcement activity</li> <li>✓ Rescue</li> </ul>	<ul style="list-style-type: none"> <li>❖ No other activities allowed</li> </ul>
Ngiwal entire inner reef (General use zone)	<ul style="list-style-type: none"> <li>✓ Subsistence fishing (fishing for personal or traditional/ceremonial purposes)</li> <li>✓ Permitted commercial fishing</li> <li>✓ Permitted fishing by non Palauans</li> </ul>	<ul style="list-style-type: none"> <li>❖ No commercial fishing by foreign licensee or partnership</li> <li>❖ No fishing with any type of nets</li> <li>❖ No fishing with explosives or harmful substances</li> <li>❖ No fishing with SCUBA</li> </ul>
Cattle Ranching zone (across from State Public Work on compact Road)	<ul style="list-style-type: none"> <li>✓ Raising of livestock</li> <li>✓ Restoration of pasture land</li> <li>✓ Replanting of vegetation</li> </ul>	
Buffer zones (area to be identified through regulation)	<ul style="list-style-type: none"> <li>✓ Open entry</li> <li>✓ Tree planning/</li> <li>✓ re-vegetation</li> </ul>	<ul style="list-style-type: none"> <li>❖ No cutting/felling of trees</li> <li>❖ No clearing of vegetation</li> <li>❖ No burning</li> <li>❖ No farming</li> <li>❖ No building of any structure</li> </ul>
Aquaculture Zone (Ngemai Bay)	<ul style="list-style-type: none"> <li>✓ To be identified through State regulations</li> </ul>	<ul style="list-style-type: none"> <li>❖ No cutting, clearing, filling of mangroves</li> <li>❖ No dredging</li> </ul>

		❖ No culturing of non-native species
Ngiwal residential subdivision	✓ Housing including septic systems ✓ Gardening	❖ No solid waste disposal ❖ No commercial farming

### 7.8 Management planning team

Masasinge Arurang	Governor, Ngiwal State
Paulus Wong	Rubak-Uong and member of KAK
Maso Ueda	Rubak-Ngirengesechei and member of KAK
Joseph Tiobech	Rubak-Misech and member of KAK
Usin Termeteet	Member of KAK
Benjamin Adelbai	Rubak-Ngirbengchall and Chairman NSPLA
Jeff Ngirarsaol	Chairman, KEDA
Jonathan Temol	Chairman, Nature Reserve Board
Romeo Teliu	Member, Nature Reserve Board
Mario Katosang	