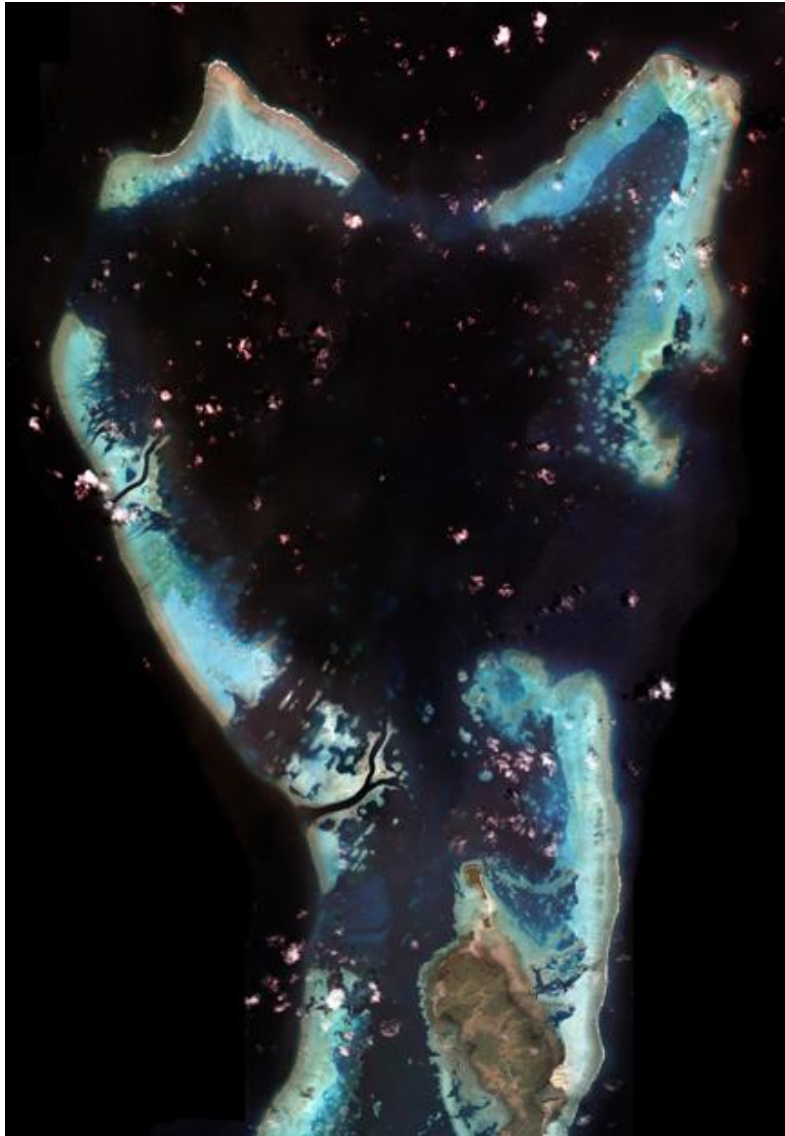


Ngarchelong Marine Managed Area Management Plan 2012 – 2017

February 2012



Ngarchelong State Government, Republic of Palau

Prepared by the 13-member Ngarchelong Marine Resource Planning Team
with assistance from Mike Guilbeaux, Joyce Beouch, Anu Gupta, The Nature Conservancy, and the
Palau Conservation Society

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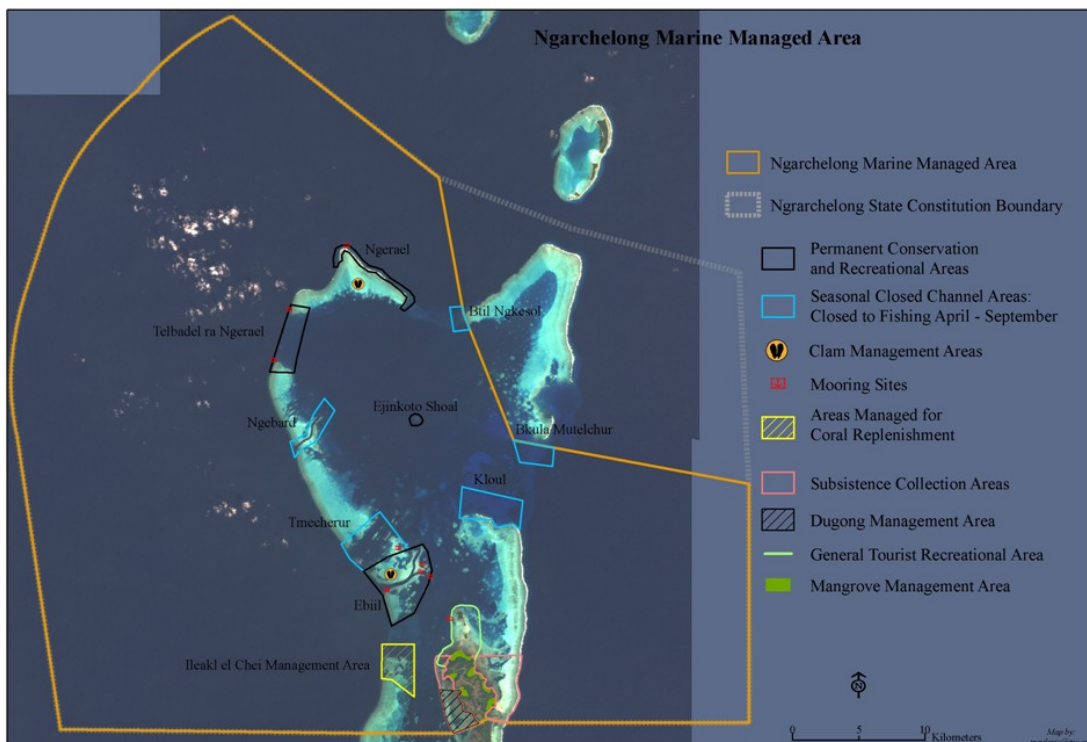
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What this plan covers

Ngarchelong Marine Managed Area (NMMA) All state waters in Ngarchelong State



Quick Peek at the Plan

Why manage these sites?

The NMMA covers all of Ngarchelong's marine resources and thus is of vital economic, subsistence, social, cultural, and ecological importance. Some areas have high fish productivity, some are resistant to climate change, and others have critical species. Many areas in the NMMA have high biodiversity and amazing underwater vistas, giving the NMMA a huge tourism potential.

Growing and competing uses, both in terms of type of use and scale, require forward planning to ensure that marine resources are not depleted but are maintained at their current near-pristine state.

This Management Plan was mandated by the Mengellakl Declaration issued by Traditional Leaders, a State Assembly Resolution, and an Executive Order by the Governor.

What we want:

Vision:

1. An environment with abundant natural resources that will sustain our residents, our economy, and visitors
2. To use our traditions, our knowledge, and the knowledge of others to better manage
3. Habitats are restored and maintained, species recover and flourish, and fisheries are productive
4. Sound fisheries management and tourism development
5. Sharing this approach, our models, and our learning for the advancement of other communities

Goal:

1. Maintain marine resources and habitats
2. Meet subsistence food fish needs of the people of Ngarchelong
3. Support limited, small scale commercial fishery
4. Support non-extractive tourism

Objective 1: Maintain culturally and economically important *fish and invertebrate* populations at current or increasing levels by 2014

Objective 2: Maintain the health of important or sensitive *habitats and sites* by protecting sensitive areas, restoring viable habitats, and reducing threats

Objective 3: Comprehensive *Tourism* planning and development

Objective 4: Effective *surveillance and enforcement* that reduces illegal activities

Objective 5: Increase *awareness* and understanding of rules, importance, management, and lessons learned

Objective 6: Implementing *monitoring* and research that provides needed information

Objective 7: Develop and implement a Business Plan that provides significant *sustainable funding*

Who is in charge?

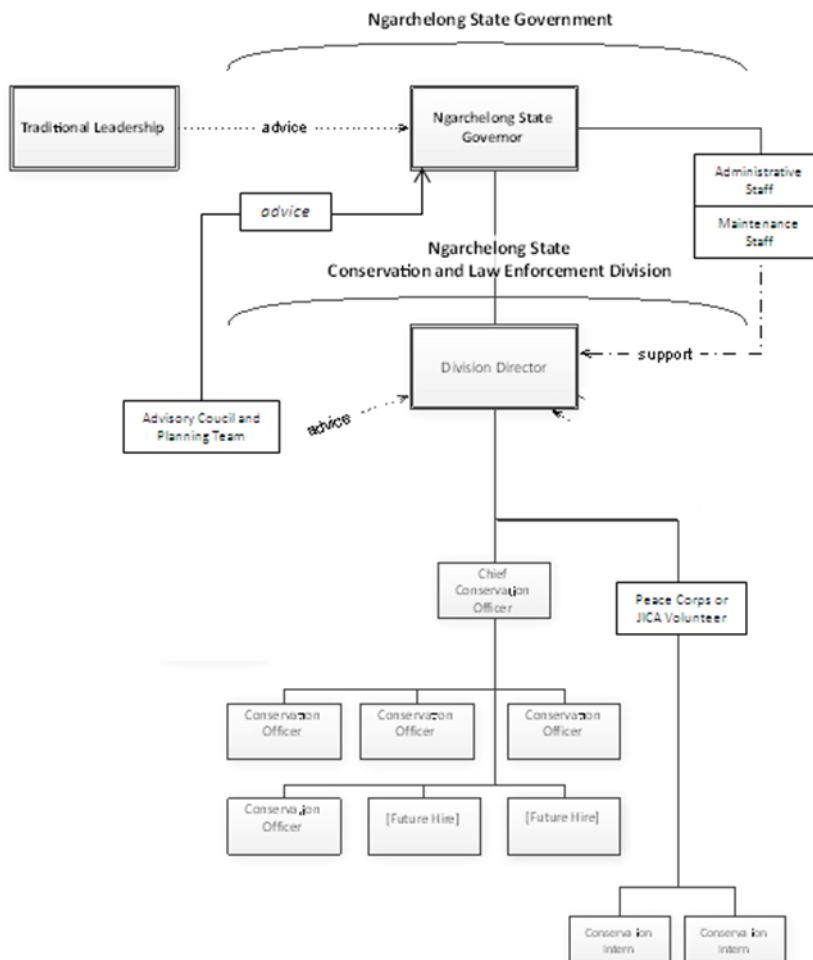
Management Authority

The Governor shall have ultimate responsibility for implementing this plan.

A Conservation and Law Enforcement Division shall be created within the State Government to implement the plan.

Traditional Leaders, the State Assembly, the Governor, and an Advisory Council shall all approve annual work plans and changes to this Management Plan.

Ngarchelong State Government
Proposed Organizational Structure
For Implementation of the Ngarchelong MMA Management Plan (v. 1.0)



What personnel are needed?

Management Personnel

Due to the size of the NMMA and its multiple uses and threats, several staff will be needed to implement this plan:

- 1 Division Director
- 1 Chief Conservation Officer
- 4-6 Conservation Officers (depending on year)
- 1-2 Conservation Interns
- Peace Corps or JICA Volunteer

This Plan also requires the services of existing State Personnel, including the:

- Existing Conservation Officers
- State Administrative Staff
- State Maintenance Staff
- State Attorney

The Advisory Council shall consist of at least seven members, representative of various stakeholder groups in Ngarchelong.

In Year 1, personnel costs are \$75,400 (25% of the total budget).

Zones:

ZONE 1. Permanent Conservation and Recreational Areas

Includes: Ebiil / Ngerael / Telbadel ra Ngerael / Enjinkoto shoal / Clam Management Area

General description: *No-take, restricted entry.*

ZONE 2. General Tourist Recreation Area

General description: *Restricted take, open entry.*

ZONE 3. Seasonal Closed Channel Areas

Includes: Btil Ngkesol, Ngebard, Kloul, Tmecherur, Bkula Mutelchur

General description: *Restricted take, restricted entry.*

ZONE 4. Exclusive Resident Use Areas

Includes: Subsistence Collection Area, Mangrove Management Area, Dugong Management Area

General description: *Restricted take, restricted entry.*

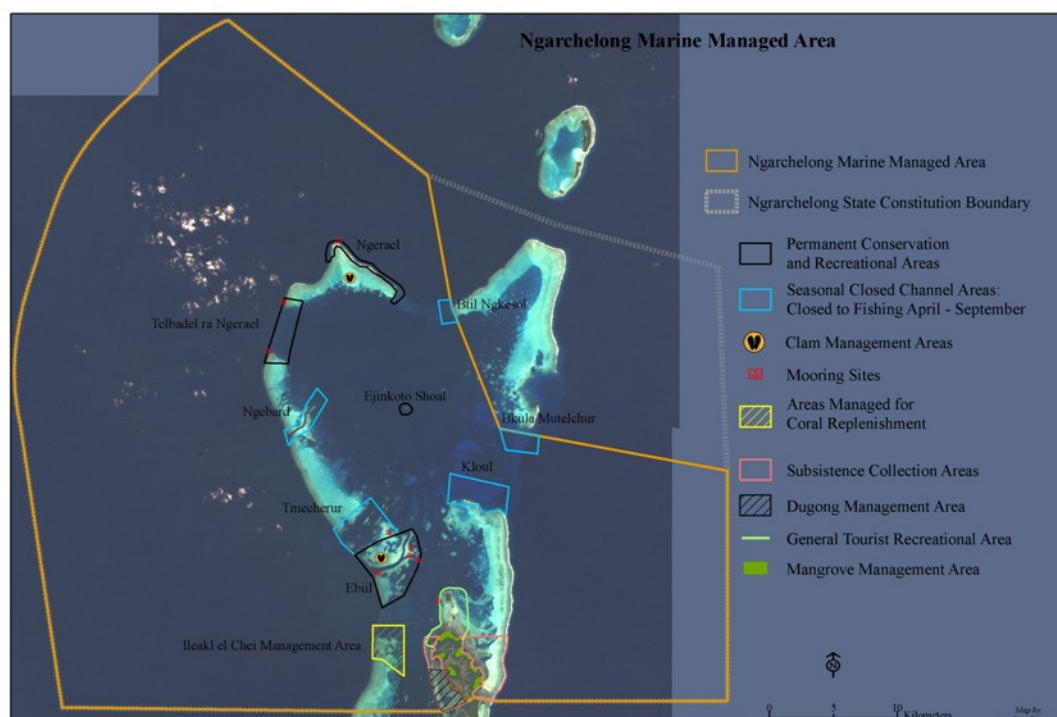
ZONE 5. Areas managed for coral replenishment

Includes: Ileakl el Chei Management Area

General description: *No-take, No-entry.*

ZONE 6. General Use Area

Includes: All areas not in Zones 1-5



Restrictions:

Restrictions or rules applying to the entire NMMA (All zones)

- All applicable national and state laws apply to the NMMA (e.g. natural resource restrictions, cultural and historical property laws, etc.).
- All tourists must have a permit to enter the NMMA (except innocent passage).
- All residents and non-residents must have a permit/license to take (harvest, fish, collect, etc.) from the NMMA.
- All non-residents must have a permit/license for commercial photography in the NMMA.
- All boats operating in the NMMA must be registered with a State.
- All visitors must check in and out at Ollei Port before using the NMMA.
- Use of flashlights while fishing is prohibited at all times in all zones.
- Starting in Year 2, use of gillnets while fishing is prohibited at all times in all zones.
- Sand mining, coral mining, and dredging of any kind is prohibited.
- Spilling or disposing of any pollutant is prohibited.
- Grounding or causing to ground any vessel is prohibited.
- Introduction of non-native species is prohibited.

Restrictions specific to zone

ZONE 1. Permanent Conservation and Recreational Areas: *No-take, restricted entry.* All entry (residents and visitors) must be accompanied.

ZONE 2. General Tourist Recreation Area: *Restricted take, open entry.* Take restricted to residents only for subsistence. No commercial take. Unaccompanied entry for tourism allowed.

ZONE 3. Seasonal Closed Channel Areas: *Restricted take, restricted entry.* All entry by tourists must be accompanied. No-take April to September. Take allowed for residents and visitors from October to March.

ZONE 4. Exclusive Resident Use Areas: *Restricted take, restricted entry.* All entry by tourists must be accompanied. Take restricted to residents only. Commercial harvesting prohibited in Subsistence Collection Area.

ZONE 5. Areas managed for coral replenishment: *No-take, No-entry.* Only permitted monitoring and enforcement allowed. Limited education entry allowed with permit.

ZONE 6. General Use Area: *Open take, open entry.*

What work needs to happen?

Administrative and Regulatory Strategies

- Setting up the NMMA's support structure (staff, equipment, reporting processes) and developing text for complementing legal structures (endorsing laws, regulations) are priorities in the first year.
- Passage of legal structures and ongoing reporting and fundraising are priorities in the second through fifth years.

Education, Awareness, Outreach, and Tourism Strategies

- Planning for detailed education and outreach and starting adult community outreach are priorities in Year 1.
- Based on the Plans, developing materials and conducting community outreach are priorities in Years 2-3.
- Improving promotion of the NMMA as a tourist destination and improving visitor experiences are priorities in Years 4-5.

Surveillance and Enforcement Strategies

- Enhancing and expanding the current surveillance and enforcement system is a priority in Years 1-2.
- Implementing enhanced surveillance and enforcement is a priority in Years 3-5.

Maintenance and On-the-ground Strategies

- Buoys, georeferencing boundaries, floating enforcement outpost, planting clams, Visitor's Center

Capacity Building Strategies

- Various trainings.

Research and Monitoring Strategies

- Collection of baseline conditions and establishment of a monitoring program is a priority in Year 1.
- Ongoing monitoring and reporting and dedicated research are priorities in Years 2-5.

Costs and funding

The size and scope of the NMMA require numerous personnel, supplies, and capital assets. The budget is therefore prepared to meet the needs of the NMMA while taking into consideration limited funding availability.

Recurring costs include salaries, supplies, transportation, meetings, and contractual services.

Unique Work Plan Costs are based on the annual Work Plan. Year 1 is based on the Year 1 Work Plan. Years 2-5 are estimated based on Year 1.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Recurring Costs	184,743	175,851	184,041	209,547	217,971
Capital Asset Costs	35,334	56,160	7,605	26,910	42,120
Unique Work Plan Costs	80,379	76,050	76,050	76,050	76,050
TOTAL, ALL COSTS	300,456	308,061	267,696	312,507	336,141

This plan relies on PAN funding during its initial years, with increasing funding becoming available from tourism, fishing, permits, and enforcement.

Forward

The people of Ngarchelong have a long-standing tradition of “*omengeromei*” or caring for the environment and the resources that it provides. It’s because of this care, our tradition, and our dependency on what the ocean provides that we are most concerned about recent changes happening in our area. Many in our State still depend and rely on our waters for food and income. Changes that our fishermen and resources users have noticed over the years are causing concern. We have strong traditions in our place, but are recognizing that it is not enough to curb the recent threats.

While the marine environment and coral reef resources of our State are generally healthy, in recent years we have grown increasingly concerned over the threat to the sustainability of our vital food resources brought about by overfishing and poaching. In response, our traditional leaders have imposed a *bul* based on customary practices to protect important food resources at specific fish spawning areas. Recently, we have also enacted modern laws, such as the Ebiil Channel Conservation Act of 2000 and the Clam Conservation Act of 2009, to compliment our traditional efforts to protect our resources. Accordingly, this Management Plan is a deliberate effort to integrate efforts to better manage our natural resources in the face of modern challenges. As identified by our leaders in the “Mengellakl Declaration,” we recognize it is time for our State to introduce new measures to better protect and control access to our State’s productive but declining marine resources. We also recognize that now is the time to integrate fisheries management, conservation, and tourism together so that they support each other in a harmonized way. We are all committed to working to establish an effective marine resource management framework so that future generations can experience and benefit from the wealth of our waters much as we do today.

This Plan embodies the vision and intent of the people Ngarchelong to better manage and protect the state’s marine resources, while providing opportunities for income generation from tourism. It contains a list of goals, objectives, and activities that will guide our efforts to manage the area’s resources and map our progress. The plan was produced by the Ngarchelong Marine Resource Planning Team collaboratively with our traditional leaders, elected representatives, fishermen, community members, and partners.

We recognize there is much work ahead, as we strive to ensure a sustainable future. It is envisioned that this plan will be reviewed and updated regularly, during annual meetings and other opportunities for evaluating our progress. What will remain constant, however, is our deep concern for our home and the resources that sustain us, which this Plan is intended to promote, now and into the future.

Brownny Salvador
Governor

A Message from the Planning Team

This plan represents the latest efforts of the people of Ngarchelong to manage our precious marine resources. In the mid-1990s, concerned about declining fish stocks, our traditional leaders applied traditional fishing closures to eight important channels in our state waters. In 2000 Ngarchelong State established the Ebiil Conservation Area to protect the biological richness of Ebiil for the long-term benefit of citizens of Ngarchelong, greater Palau, and the world. Approximately 15 km² in area, the site is of special significance because of its spawning aggregations of groupers, invertebrate populations, and unique coral communities. The area is also intended to be used as a tourist attraction so that it supplements site management costs. Although these closures have helped protect some resources, the people of Ngarchelong realized that this has not been enough. Enforcement of conservation rules has been difficult, and generating sustainable funding and building capacity for our citizens has been challenging.

Fortunately, advancements in Palau (such as the PAN) and the globe have offered new opportunities to meet these challenges. Members of our community have recognized the value of capitalizing on these opportunities by creating a comprehensive plan that sets the direction and rules of Ngarchelong's management efforts. This Plan lays out our ideas for improving enforcement, generating sustainable funding, and building capacity, among other things. This plan also reduces our reliance on single initiatives that vary from time to time. This is a new step for our state and one that has the blessing of our leaders. We developed this Plan in partnership with local leaders, community members, supporting partners, and as representatives of the Ngarchelong community.

Some might argue that this plan is too restrictive for some, especially those that sell fish or make a living from the ocean. However, we have created this plan and its restrictions because we care about these activities and want to see them be an important part of our future. We have made decisions in this plan because we care about our home and the food we receive from it. We believe that by managing our resources well, we will be able to continue receiving our food from the ocean, and will also begin to benefit from the ocean in new ways.

We know that implementing this Plan will be difficult, but we also know that if we work as a community we can ensure our resources will be there now and in the future. We are proud to have been able to work on this Plan on behalf of the current and future generations of the Ngarchelong community, and we look forward to working together to implement this Plan and ensuring a sustainable future.

The Ngarchelong Planning Team

Acknowledgements

The Ngarchelong State Government, the Ngarchelong community, and the Ngarchelong Marine Resource Planning Team would like to thank the many individuals and organizations that assisted with the development of this plan. Many individuals, including local fishermen and residents, traditional leaders, and state officials provided their knowledge, information, and ideas to make this plan as relevant and accurate as possible. The time and contribution to the plan by these organizations and individuals has been significant, making the plan more complete and balanced.

In particular, we would like to acknowledge the contributions of:

German LifeWeb Initiative
US Department of Interior
US National Oceanic and Atmospheric Administration
The Nature Conservancy
Palau Conservation Society
Palau International Coral Reef Center
Ministry of Natural Resources, Environment and Tourism
Coral Reef Research Foundation
Sam's Dive Tours
Fish 'n Fins
Palau Visitors Authority

It is important to mention the early draft of the Sustainable Development Plan for Ngarchelong State, dated July 1996, which served as a tremendous resource and guide in preparing the current plan. Crucial contributors to that document included now-Minister Faustina Rehuher and the Belau Division of Cultural Affairs, the Department of Marine Resources, the Palau Visitor's Authority, the Palau Conservation Society, the Nature Conservancy and others.

For additional information regarding this management plan, please contact:

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INTRODUCTION

Ngarchelong State is the northernmost state on Babeldaob Island in the Republic of Palau. Ngarchelong is home to some of Palau’s most abundant and productive fishing grounds and most spectacular marine environments. Making up part of Palau’s Northern Lagoon, the State’s marine territory includes 197.4 km² of reef, channels, lagoon, mangrove, and open ocean out to 12 miles. All of the state’s marine territory is covered by this Management Plan, and thus the area is named the “Ngarchelong Marine Managed Area” (NMMA).

Figure 1 shows the area covered by this Plan. It includes all marine areas clearly under state jurisdiction (e.g. not under any form of dispute). This includes all marine areas directly adjacent to Ngarchelong’s terrestrial lands (such as mangroves) and waters out to 12 miles or abutting other political boundaries (e.g. Kayangel and Ngarard). A portion of reef (Ngkesol) included in the Ngarchelong State Constitution but also claimed by Kayangel is not included in this Plan at this time.

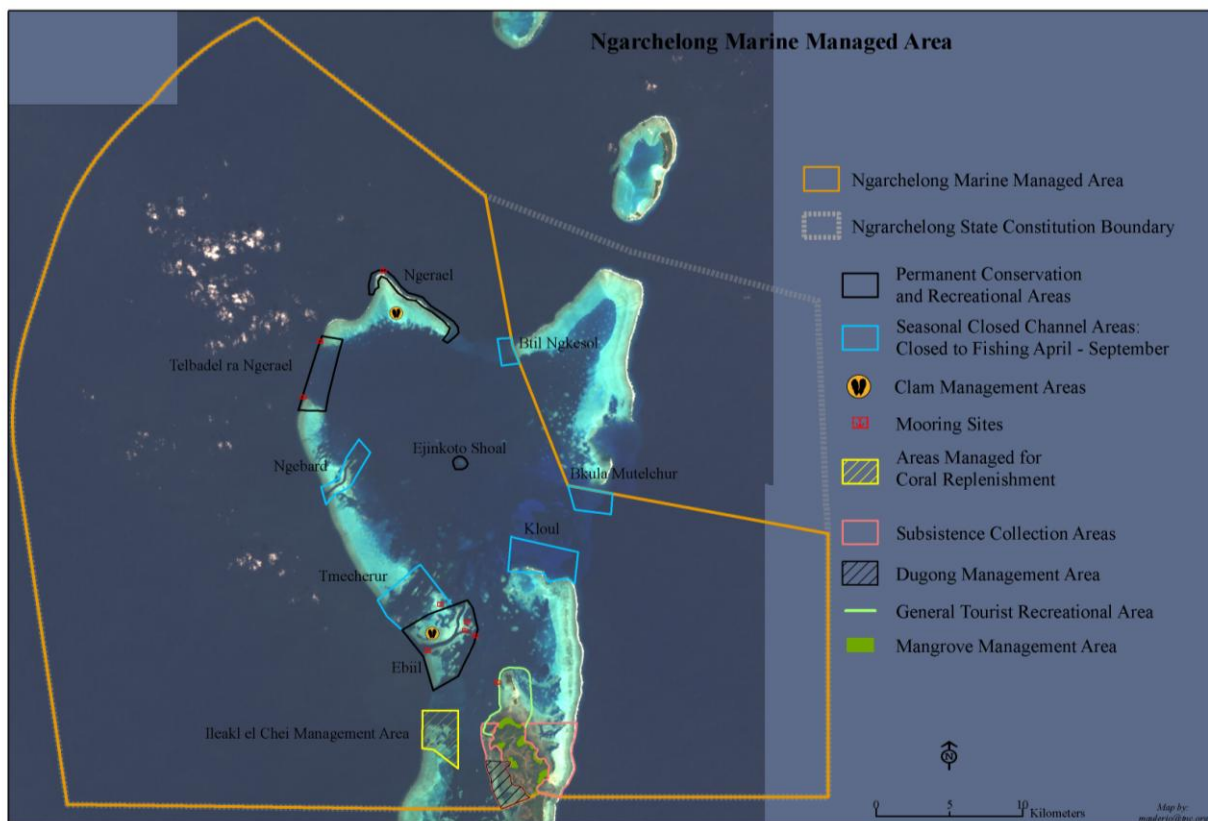


Figure 1. The Ngarchelong Marine Managed Area.

A Management Plan for the NMMA was mandated by State Assembly Resolution No 13-17 and Executive Order No. 08-01. Both also mandated creation of a Planning Team. This Management Plan is intended to be both a guide and a legal document. Ngarchelong State will need to pass enabling legislation in order to give this Plan force of law.

The NMMA includes the Ebiil Conservation Area. Ngarchelong State Government Public Law No 04-007 (2003) established Ebiil Channel and surrounding reefs as a conservation area permanently. This Plan supersedes the Ebiil Conservation Area Management Plan. The NMMA also includes nearshore marine resources that fall under the authority of traditional leaders. This Management Plan does not in any way impair traditional fishing rights or practices.

This Plan has been designed to meet the criteria of the national Protected Areas Network (PAN) to ensure effective and continuous management of the marine area into perpetuity. This Plan provides a practical and cost-effective management approach. The Plan identifies the strategic goals and objectives of Ngarchelong's state government and community and lays out an action plan and proposed budget to achieve these goals. The Plan also provides information on the ecological and socioeconomic characteristics of the NMMA. This is a 5-year Plan.

Section A includes all of the plans and intended actions for the NMMA in the next five years. Section B includes all of the background information explaining how this Plan was formed and the rationale for the decisions taken in the Plan.

SECTION A. NMMA PLANS AND INTENDED ACTIONS

I. DESIRED MANAGEMENT OUTCOMES

Overall Mandates

This Plan seeks to achieve the mandates of elected and traditional leaders:

1. Mengellakl Declaration calls for
 - a. A management regime that provides for the wise use of its resources.
 - b. A written management plan – always subject to improvement – that guides day-to-day management.
 - c. A scope that includes all sectors of fisheries, tourism, and conservation (omengercomel).
2. Resolution No. 13-17 calls for
 - a. An effective management regime that considers support for existing traditional management, enlistment of modern science and technology, recommended legislation, new programs, and budgets.
3. Executive Order No. 08-01 mandated
 - a. A plan with goals, strategies, and a 3-5 year action plan.

Underlined items are explicitly considered or included in this Plan.

The management of the NMMA is guided by a broad vision and goals drafted by the Planning Team. The vision takes a long-term perspective and goals and objectives take a shorter-term perspective.

Vision

“We the people of Ngarchelong envision a future where our local communities are strong, healthy, and live in balance with our natural surroundings. We seek to work towards maintaining an environment with abundant natural resources that will sustain our residents, our economy, and visitors now and in the future. We wish to use our traditions, our knowledge, and the knowledge of others to better manage the terrestrial and marine resources of Ngarchelong State

so that habitats are restored and maintained, species recover and flourish, and fisheries are productive. We also wish to integrate effective resource management (*omengereomeh*) with sound fisheries management and tourism development so that our leaders can be supported to promote the best forms of sustainable livelihood of our people and State. As we are learning from ourselves and others, we are committed to successfully applying our efforts for the benefit of our community, the Republic of Palau, and the broader world community, and to sharing this approach, our models, and our learning for the advancement of other communities in the Pacific who share similar resource management and community development goals.”

Goal

Use traditional knowledge and modern science to improve and sufficiently maintain the marine resources and habitats of Palau’s Northern Lagoon to satisfy the subsistence food fish needs of the people of Ngarchelong, support a limited, small scale commercial fishery and non-extractive tourism activities, and become a model for sharing information on successful management.

This goal has four components that work together towards achieving the mandates of the Mengellakl Declaration and the Vision:

1. Maintaining marine resources and habitats – Conservation
2. Subsistence food fish needs of the people of Ngarchelong – Fisheries
3. Limited, small scale commercial fishery – Fisheries
4. Non-extractive tourism – Tourism

This goal enables and allows for the wise use of the Northern Lagoon’s resources. Objectives and activities build on these four components.

Objectives

Goal Component: Subsistence fishing

Goal Component: Commercial fishing

Objective 1: Manage fisheries activities, particularly by using the wisdom of traditional leaders, within the Ngarchelong MMA to maintain culturally and economically important fish and invertebrate populations at current or increasing levels by 2014.

Goal Component: Resource and habitat conservation

Objective 2: Maintain the health and quality of important or sensitive habitats and sites (e.g., exceptionally diverse or productive marine habitats) in Ngarchelong State waters by protecting sensitive areas, restoring viable habitats, and reducing and/or controlling threats to these areas.

Goal Component: Tourism

Objective 3: Complete a comprehensive Tourism Planning and Development process for the State of Ngarchelong by the end of 2014 that results in tangible policy outcomes formally adopted by the State, promotes mutually-beneficial, culturally-appropriate, and environmentally-sound tourism, and increases the number of tourists visiting the NMMA towards a sustainable capacity level.

All Components

- Objective 4: Develop an effective surveillance and enforcement program that reduces illegal activities within the NMMA to negligible levels by the end of 2013
- Objective 5: Promote awareness and understanding among the community, managers, and other stakeholders of 1) NMMA rules and provisions, 2) the status, importance, and changes of marine resources at the site, 3) the impact of human activities and management actions, and 4) lessons learned from management.
- Objective 6: Develop a monitoring and research program and use data generated by the program to address important management questions posed by the community, NMMA managers, and supporting partners.
- Objective 7: Develop and implement components of a Business and Sustainability Plan for the NMMA by 2014 to develop 1) operational sufficiency and efficiency, 2) accountability, and 3) sustainable finance sources (including funding through the Palau PAN and revenue generation through the promotion of dive and sportsfishing tourism), so that the NMMA's reoccurring operating costs are met yearly.

General Approach

The general approach for the management of the NMMA will be to establish greater management control, activity regulation, and enforcement within the area, and to provide additional rules (some general, some specific) for the management of activities within the area. The management regime presented in this plan will build on customary ownership principles. This Plan calls for the establishment of a Conservation and Law Enforcement Division within the State Government to implement activities and enforce restrictions. The new Division will require substantial training and support throughout its development, and additional, specific plans and requirements for these steps are further identified within this Plan. The development of a Visitors Program and the establishment of a harbor-side office and awareness center is also planned to contribute to the visitor experience and site management. Increased awareness and "adaptive management" of the site and program is a key characteristic of the planned activities. Suggested steps for reporting, sharing of information, and review and revising of the plan for these purposes are also included within. The Plan is intended to be responsive to traditional leaders and local communities of Ngarchelong, and be supervised by the State Governor and Assembly.

II. FIVE-YEAR STRATEGIC PLAN

Activities were determined by the Planning Team and by consultants working on this plan. All activities were approved by the Planning Team. Activities were developed to meet each objective. **An Excel Spreadsheet accompanies this Plan and is meant to be used by implementers.** The Excel Spreadsheet lists all activities by objective. It also includes the lead person(s), schedule, priority level, desired indicator of success, and how the activity is measured for progress. The section presented here summarizes and collapses activities per general strategy and describes the general management directions of this Plan.

Activities fall into one of six categories, in line with the PAN criteria: 1) Administrative and Regulatory, 2) Education, Outreach and Awareness, 3) Enforcement and Surveillance, 4) Maintenance and On-the-Ground, 5) Monitoring and Evaluation, and 6) Capacity Building strategies.

Administrative and Regulatory Strategies

Administrative strategies include all activities to establish and administer the NMMA, including hiring and financing of this Plan and reporting. Regulatory strategies include all activities to establish a legal framework to authorize and implement this Plan. **Administrative and regulatory strategies are a priority in Year 1.**

- Setting up the NMMA's support structure (staff, equipment, reporting processes) and developing text for complementing legal structures (endorsing laws, regulations) are priorities in the first year.
- Passage of legal structures and ongoing reporting and fundraising are priorities in the second through fifth years.

Activities in Year 1 (*Also see ongoing activities below*)

Establishment of the NMMA (Hiring, Creating Division, Property Management)

1. Governor and State Assembly create a NMMA Division within the state government.
2. Governor and State Assembly recruit and hire a Division Director.
3. Governor and Division Director recruit and hire additional Conservation Officers.
4. Division Director, Governor, and State Administrative staff source and secure enforce materials and equipment (e.g. binoculars, uniforms, etc.).
5. Conservation Officers and State Maintenance Staff perform regular maintenance of all equipment.
6. Division Director, Conservation Officers, and State Administrative Staff perform yearly inventories of all equipment.

Fundraising¹

1. Governor submits an application for the NMMA to become a PAN site
2. Governor and Division Director write grants and fundraise for training opportunities for all staff, with particular emphasis on Conservation Officer training.
3. Governor, State Assembly, and Chiefs actively advocate for funding for the state from PAN and other sources (e.g. Governor contacts PAN F Board and Ministry of NRET).
4. Governor secures funding for consultants (NMMA Visitor Plan, Visitor Center, Outreach and Communications Plan, Enforcement Plan)

Planning

1. Division Director prepares Annual Work Plans and Budgets
2. Division Director, Advisory Council, Consultants, and Technical Partners develop
 - a. NMMA Visitor Plan and Program
 - b. Outreach and Communications Plan
 - c. Enforcement Plans
3. Consultants/Contractors develop building plans for Visitor's Center

Tracking/Reporting

1. Governor and Division Director hold quarterly meetings with staff to review progress and evaluate strategies.

¹ Unless PAN funds are adequate

2. Governor and Division Director hold annual meeting with all relevant stakeholders to go over progress.
3. Division Director prepares Annual Report.
4. Governor, Division Director, and State Administrative Staff track usage of funds and ensure that funds are spent according to the allowed budget.

Legal Structures

1. Governor and State Assembly pass enabling legislation adopting this Plan and giving it force of law
2. State Attorney, Division Director, and State Assembly draft:
 - a. Rules and regulations to formalize zones and restrictions in this Plan, including
 - i. Clear definitions of “commercial fishing” and other restricted activities must be developed in the regulations.
 - ii. Clear definitions of which laws and rules Conservation Officers and other law enforcement personnel may enforce (traditional bul and/or legislative measures) (**Appendix 1**).
 - iii. License and Boat registration requirements and procedures
 - b. Any missing rules and regulations to restrict fishing and collection techniques or to restrict access
 - c. Develop permit (Visitor, Research) systems (fees, application form, process)
 - d. Develop fines and penalties
3. State Attorney reviews existing state laws for legislative conflicts and suggests revisions of laws if necessary.
4. State Assembly and Governor pass laws to resolve any legislative conflicts.

Specific Activities in Years 2-3

1. Division Director and Governor write grants or work with national and foreign governments to fundraise for Visitor’s Center (\$250,000).
2. Division Director and Governor fundraise for and contract a consultant to develop a Business and Sustainability Plan.
3. Division Director and Governor fundraise to support Conservation Interns
4. Division Director and Consultant develop Business and Sustainability Plan
5. State Assembly passes legislation to adopt rules, regulations, fees, fines, and permits

Specific Activities in Years 4-5

1. Governor and State Assembly initiate a full planning process to review Management Plan and revise Management Plan for next 5-year period.
2. Governor and Division Director hire Conservation Interns
3. Governor, Division Director, and relevant staff implement Business and Sustainability Plan

Ongoing/Continued Activities in All Years

1. Governor and State Administrative Staff ensure that all permits approved by office are in line with the Management Plan
2. Maintenance of all property
3. Yearly inventories
4. General fundraising and active advocacy for PAN and other funds
5. Quarterly and Annual meetings to review progress
6. Tracking of use of funds and adherence to budget

7. Annual Planning and budgeting
8. Annual reporting
9. Supervising and hiring of staff and interns as needed

Education, Awareness, Outreach, and Tourism Strategies

Outreach Strategies include all efforts to raise awareness about the NMMA, both to local and foreign audiences, for the purposes of community involvement and tourism. **Enhanced outreach is a priority in Years 2-3.**

- Planning for detailed education and outreach and starting adult community outreach are priorities in Year 1.
- Based on the Plans, developing materials and conducting community outreach are priorities in Years 2-3.
- Improving promotion of the NMMA as a tourist destination and improving visitor experiences are priorities in Years 4-5.

Activities in Year 1 (*Also see ongoing activities below*)

Planning (same as in Administrative Section)

1. Division Director, Advisory Council, Consultants, and Technical Partners develop
 - a. NMMA Visitor Plan and Program
 - b. Outreach and Communications Plan

Community (Internal) Outreach

1. Division Director and Planning Team hold community outreach on this Management Plan (public hearings, newspaper release, and radio).

Tourism Outreach

1. Governor and Division Director continue to support existing tourism while Visitor Plan is being developed (current promotion, community involvement).

Specific Activities in Years 2-3

Materials

1. Division Director develops materials for tourists and visitors (brochures, website, signs, videos, pamphlets).
2. Division Director develops materials for community outreach (radio announcements, press releases, reports, slideshows, guest presentations, fact sheets, school materials, posters, etc.)
3. Division Director and Conservation Officers develop guidelines for visitation (e.g. no walking on coral)
4. Division Director and Conservation Officers develop guidelines for boat operators and visitors on invasive species.

Specific Activities in Years 4-5

Tourism Outreach

1. Division Director holds training workshops to encourage community participation in tourism
2. Conservation Officers and Tour Guides educate all visitors on guidelines for NMMA and accompany all visitors to sites.

3. Governor and Division Director implement Visitor Plan and expand promotion and marketing of the NMMA as a tourist site.
4. Governor expands partnerships with tour operators.

Ongoing/Continued Activities in All Years

1. Community meetings, press releases, and written materials on Plan and progress (including results from monitoring, plans, etc.)
2. Community outreach (meetings, press, materials, school visits, summer camp) on the NMMA and its biological and socioeconomic significance, sensitive habitats, fisheries, etc.
3. Promote and market the NMMA as a tourist site.
4. Brief visitors on NMMA guidelines.

Surveillance and Enforcement Strategies

Enforcement and surveillance strategies include those efforts to monitoring users of the NMMA for compliance to laws and regulations, and to stop non-compliance through policing of the area, interceptions, and prosecutions.

- Enhancing the current enforcement system is a priority in Years 1-2.
- Implementing enhanced enforcement is a priority in Years 3-5.

“Ngarchelong rubak are exercising and implementing the bul, and it’s working, but, still, we need a strong team of rangers to do this kind of work.”

Uong er Etei, July 2009

Activities in Years 1-2 (*Also see ongoing activities below*)

1. Division Director, Conservation Officers, and Consultant develop a Compliance and Enforcement Plan.
2. Division Director, Conservation Officers, and Consultant develop a Day-to-Day operations plan.
3. Division Director, Conservation Officers, and Consultant develop Standard Operating Procedures.
4. Division Director, Conservation Officers, and Consultant develop a system for keeping records of daily activities, records, violations, etc.
5. Consultant and Conservation Officers develop daily log books.
6. Conservation Officers track daily activities and events with log books.
7. Consultant, Conservation Officers, and State Attorney develop citation books and other paperwork necessary to enhance enforcement.
8. Division Director and Governor fundraise for training opportunities for Conservation Officers
9. Conservation Officers receive training.
10. Conservation Officers continue existing surveillance and monitoring.
11. Governor and Division Director establish partnerships with Ministry of Justice (Police and Fish & Wildlife).
12. Division Director, Governor, and State Administrative staff source and secure enforce materials and equipment (e.g. binoculars, uniforms, etc.).

Activities in Years 3-5

1. Conservation Officers conduct daily surveillance of NMMA by boat and through remote methods.
2. Conservation Officers actively enforce laws and plans (intercepting boats, checking permits, issuing citations, tracking violations, etc.).
3. Conservation Officers track daily activities and events with log books.
4. Conservation Officers and Tour Guides accompany all visitors and tourists to restricted NMMA zones.
5. State Attorney prosecutes violations or enforces fines.
6. Conservation Officers participate in Police Academy and are deputized.
7. Conservation Officers inspect boats for invasive species and brief visitors on invasive species issues.

Maintenance and On-the-Ground Strategies

Maintenance and on-the-ground strategies include activities that require physical labor and result in a tangible outcome.

Activities in Years 2-3

1. Conservation Officers mark boundaries of zones with buoys.
2. Conservation Officers georeference boundaries with GPS and submit to State Administrative Personnel and State Attorney for formal records.
3. Conservation Officers place mooring buoys at tourist sites.
4. Conservation Officers and Division Director construct a floating platform for Ebiil Channel.
5. Division Director, Conservation Officers, and Community members plant clams.
6. Division Director and Technical Partners hold meetings to identify activities to reduce land-based pollution.
7. Conservation Officers and Community members implement activities to reduce land-based pollution.

Activities in Years 4-5

1. Governor and Division Director oversee construction of Visitor's Center.

Capacity Building Strategies

Capacity building strategies include efforts to train NMMA staff and community members to implement this Plan.

Activities in Year 1

1. Division Director and Technical Partners develop training program for Conservation Officers

Activities in Years 2-5

1. Division Director and Technical Partners coordinate training for Conservation Officers to implement Plan and be deputized.
2. Division Director and Technical Partners coordinate training for NMMA staff on community outreach skills.
3. Division Director and Technical Partners coordinate training for NMMA staff on monitoring techniques.

4. Division Director coordinates workshops for community members on tourism.

Research and Monitoring Strategies

Research and monitoring strategies include efforts to monitor the effectiveness of this Plan in the short- and long-term. It also includes dedicated research projects to fill specific knowledge gaps. Strategies include biophysical monitoring, socioeconomic monitoring, outcome monitoring, and targeted research. This Management Plan relies on technical partners for initial biophysical monitoring, but includes a strategy to build internal capacity to carry out all monitoring.

- Collection of baseline conditions and establishment of a monitoring program is a priority in Year 1.
- Ongoing monitoring and reporting and dedicated research are priorities in Years 2-5.

Activities in Years 1-2

1. Conservation Officers and Technical Partners continue existing monitoring activities.
2. Division Director collects existing data to establish baseline conditions.
3. Division Director and Technical Partners (Monitoring Working Group) develop a monitoring plan.
4. Division Director, Monitoring Working Group, and State Assembly develop research guidelines and permit system.

Activities in Years 3-5

1. Conservation Officers, Technical Partners, and Community members undertake regular monitoring.
2. All NMMA staff and Monitoring Working Group conduct annual review meetings.
3. Division Director coordinates research to confirm sensitive sites.
4. Division Director coordinates research on Fisheries Information Project.
5. Division Director coordinates research to characterize Tourism market
6. Division Director coordinates follow-up socioeconomic survey
7. Division Director coordinates training for Conservation Officers and communities on monitoring techniques.

Capacity Building Plan

Ngarchelong has already invested in capacity building for its staff, but there are still gaps that need to be fixed in order to fully implement this Plan.

Funding is critical to implement this Plan. Thus, building capacity includes fundraising. Initial funds will be sought from the PAN and then additional funds will be raised through grants, fees, fines, and permits. Staff positions must be filled in order to have enough capacity to implement this Plan.

A NMMA Division within the State Government will need to be established in order to organize staff and funds.

A key gap in capacity is the ability to fully enforce this Plan. After development of such things as Standard Operating Procedures, citation books, log books, etc., Conservation Officers will need to build their capacity to use these products, and understand and enforce laws. This Plan includes an

activity to develop an Enforcement Plan which should include capacity building exercises. Additionally, this Plan intends to take advantage of existing training opportunities such as the Palau Police Academy and the University of Guam Conservation Officer training program.

Ngarchelong is a member of the Belau Watershed Alliance and has participated in the Belau Locally Managed Aare Network. All NMMA staff should attend BWA and BLMMA meetings in order to meet partners and strengthen their personal networks. The State Attorney should also participate in networking activities to gain access to technical information that can be used when drafting new permits, etc.

The Palau Conservation Society and other technical partners offer mentoring services and all NMMA staff should meet with Technical Partners to identify mentoring needs.

This Plan includes workshops to raise the capacity of the NMMA staff on community outreach, monitoring, and tourism.

III. FIRST-YEAR WORK PLAN

The full First-Year Work Plan is included as **Appendix 2**. Projected cost for Year 1 is **\$300,456**. This includes baseline recurring costs, purchase or acquisition of capital assets, and unique costs that are associated with yearly activities in the work plan (e.g. specific educational materials).

Recurring Costs	\$184,743
Capital Assets and Equipment	\$35,334
<u>First-Year Work Plan Unique Costs</u>	<u>\$80,379</u>
TOTAL	\$300,456

IV. PROPOSED 5-YEAR BUDGET AND BUDGET JUSTIFICATION

Summary

	Year 1	Year 2	Year 3	Year 4	Year 5
Recurring Costs TOTAL	184,743	175,851	184,041	209,547	217,971
Capital Asset Costs TOTAL	35,334	56,160	7,605	26,910	42,120
Unique Work Plan Costs TOTAL	80,379	76,050	76,050	76,050	76,050
TOTAL, ALL COSTS	300,456	308,061	267,696	312,507	336,141

Detail

	Year 1	Year 2	Year 3	Year 4	Year 5
RECURRING COSTS					
<i>Personnel</i>					
Division Director (upper salary range)	23000	23000	23000	23000	23000
Chief Conservation Officer (upper salary range)	15000	15000	15000	15000	15000
Conservation Officer (@ \$8000)	32000	32000	32000	40000	48000
Conservation Interns (@\$3000)	0	3000	3000	6000	6000
Peace Corps Volunteer/JICA Volunteer	2400	2400	2400	2400	2400

	Year 1	Year 2	Year 3	Year 4	Year 5
State Finance Officer (20%)	3000	3000	3000	3000	3000
Total C&LE Staff	7	8	8	9	10
<i>Subtotal</i>	<i>75400</i>	<i>78400</i>	<i>78400</i>	<i>89400</i>	<i>97400</i>
Supplies					
Paper supplies	1000	1000	1000	1000	1000
Office supplies	2000	2000	2000	2000	2000
Consumable Field supplies	1000	1000	1000	1000	1000
Uniforms	700	100	100	900	100
<i>Subtotal</i>	<i>4700</i>	<i>4100</i>	<i>4100</i>	<i>4900</i>	<i>4100</i>
Transportation					
Fuel (truck)	6000	6000	6000	6000	6000
Fuel (boat)	40000	40000	50000	60000	60000
Maintenance	4000	4000	4000	4000	4000
International Travel (Capacity building)	4300	4300	4300	4300	4300
<i>Subtotal</i>	<i>54300</i>	<i>54300</i>	<i>64300</i>	<i>74300</i>	<i>74300</i>
Meetings					
Quarterly and Annual meetings	500	500	500	500	500
Community meetings	2000	2000	2000	2000	2000
<i>Subtotal</i>	<i>2500</i>	<i>2500</i>	<i>2500</i>	<i>2500</i>	<i>2500</i>
Contractual					
State Attorney	15000	5000	2000	2000	2000
Annual Reports, Workplans, and Budgets	3000	3000	3000	3000	3000
Monitoring and Evaluation	3000	3000	3000	3000	3000
<i>Subtotal</i>	<i>21000</i>	<i>11000</i>	<i>8000</i>	<i>8000</i>	<i>8000</i>
Subtotal (All categories)	157900	150300	157300	179100	186300
Administration (17%)	26843	25551	26741	30447	31671
Includes occupancy, utilities, communications, insurance, bank fees, audits, miscellaneous operational expenses					
Recurring Costs TOTAL	184743	175851	184041	209547	217971
CAPITAL ASSETS AND EQUIPMENT					
Program Office and Outreach Center			250000*		
Floating platform for Ebiil	10000				
Boat upgrades		40000			
Boat engine replacement (4)					30000
Truck/Van replacement				15000	
Field equipment (GPS, cameras, binoculars, radios, SCUBA gear, safety equipment) (@1000 per staff)	7000	1000	0	1000	1000
Mooring buoys	5000				
Demarcation buoys	5000	5000	5000	5000	5000
Desktop computer		2000			

	Year 1	Year 2	Year 3	Year 4	Year 5
Laptop computer	2000			2000	
Projector			1500		
Printer	500				
PA System	700				
* To be fundraised for separately					
<i>Subtotal (All categories)</i>	30200	48000	6500	23000	36000
Administration (17%)	5134	8160	1105	3910	6120
Includes occupancy, utilities, communications, insurance, bank fees, audits, miscellaneous operational expenses					
Capital Asset Costs TOTAL	35334	56160	7605	26910	42120
WORK-PLAN UNIQUE COSTS					
Activity costs from Appendix 2 (non-recurring, non-capital asset). Years 2-5 are estimated based on Year 1.	68700	65000	65000	65000	65000
Administration (17%)	11679	11050	11050	11050	11050
Unique Work Plan Costs TOTAL	80379	76050	76050	76050	76050
TOTAL, ALL COSTS	300456	308061	267696	312507	336141

The budget justification is attached as **Appendix 3**.

Sustainable Financing Mechanism

Protected Areas Network (PAN)

Initial funding is intended to come from the PAN. In the first year nearly 100% of the costs of managing the NMMA are to come from the PAN, with the goal of reducing the reliance on PAN funds each year until the PAN fund is only being used to supplement identified activity gaps and not recurring costs.

User Fees, Access Fees, Fines, and Grants

Fees from entry into the NMMA for allowable recreational activities, license or permit fees, fines for non-compliance, and grants will supplement PAN funds. It is intended that these funds will grow each year, such that the reliance on PAN funds declines every year until PAN funds are used only to fill activity gaps.

V. ZONES

There are six broad zones in the NMMA. Zones may have specific areas within them with individual restrictions. **Figure 2** shows all zones and special areas. Zones were designed based on best available knowledge and are subject to revision during revisions of this Management Plan.

All take and entry are subject to national and state laws. All tourists must have a permit to enter NMMA (excluding innocent passage). All non-residents (visitors) must have a permit to take.²

² Residents include individuals who 1) currently live in Ngarchelong, 2) have close family from or in Ngarchelong, 3) participate in Ngarchelong customs, and/or contribute to community work and service in Ngarchelong. Visitors include

ZONE 1. Permanent Conservation and Recreational Areas

Includes: Ebiil / Ngerael / Telbadel ra Ngerael / Enjinkoto shoal / Clam Management Area

Purpose: Food security, Reef maintenance, Special habitats, Income generation through tourism, historical preservation, giant clam reproduction

General description: *No-take, restricted entry.* All entry (residents and visitors) must be accompanied.

ZONE 2. General Tourist Recreation Area

Purpose: Access and space for unguided tourism (kayaking).

General description: *Restricted take, open entry.* Take restricted to residents only for subsistence. No commercial take. Unaccompanied entry for tourism allowed.

ZONE 3. Seasonal Closed Channel Areas

Includes: Btil Ngkesol, Ngebard, Kloul, Tmecherur, Bkula Mutelchur

Purpose: Sustainable fisheries

General description: *Restricted take, restricted entry.* All entry by tourists must be accompanied. No-take April to September. Take allowed for residents and visitors from October to March.

ZONE 4. Exclusive Resident Use Areas

Includes: Subsistence Collection Area, Mangrove Management Area, Dugong Management Area

Purpose: Food security, resident income and subsistence, endangered species protection

General description: *Restricted take, restricted entry.* All entry by tourists must be accompanied. Take restricted to residents only. Commercial harvesting prohibited in Subsistence Collection Area.

ZONE 5. Areas managed for coral replenishment

Includes: Ileakl el Chei Management Area

Purpose: Coral replenishment, climate change resilience, special habitat conservation

General description: *No-take, No-entry.* Only permitted monitoring and enforcement allowed. Limited education entry allowed with permit.

ZONE 6. General Use Area

Includes: All areas not in Zones 1-5

Purpose: General use (fisheries, visitation, passage)

General description: *Open take, open entry.*

Future zoning needs

These zones will be reviewed by the Advisory Council as part of annual reviews. If additional zones (e.g. for mooring areas or anchorage sites) are needed, the Advisory Council will make recommendations for changes.

Palauan and foreign visitors who cannot claim in any way to be from Ngarchelong. Tourists include all visitors in Palau on a tourist visa.

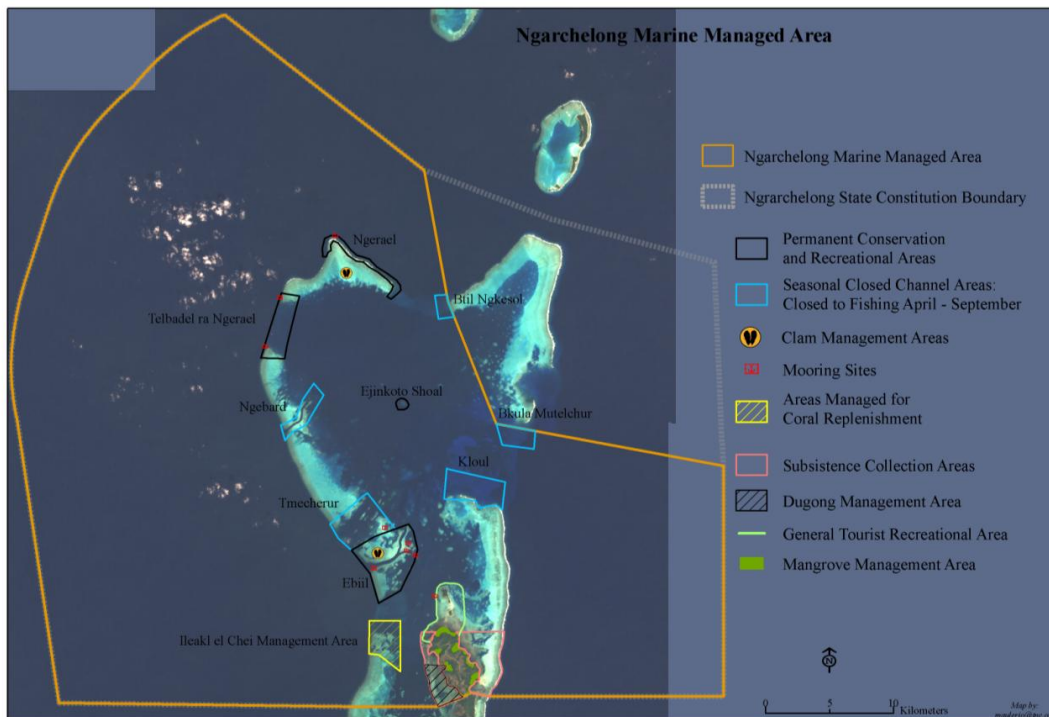


Figure 2. Zones and special areas in the NMMA. Boundaries are approximate and correspond to georeferenced coordinates available at the Ngarchelong State office.

VI. PROHIBITED, RESTRICTED, AND ALLOWABLE ACTIVITIES

Restrictions or rules applying to the entire NMMA (All zones)

1. All applicable national and state laws apply to the NMMA (e.g. natural resource restrictions, cultural and historical property laws, etc.).
2. All tourists must have a permit to enter the NMMA (except innocent passage).
3. All residents and non-residents must have a permit/license to take (harvest, fish, collect, etc.) from the NMMA.
4. All non-residents must have a permit/license for commercial photography in the NMMA.
5. All boats operating in the NMMA must be registered with a State.
6. All visitors must check in and out at Ollei Port before using the NMMA.
7. Use of flashlights while fishing is prohibited at all times in all zones.
8. Starting in Year 2, use of gillnets while fishing is prohibited at all times in all zones.
9. Sand mining, coral mining, and dredging of any kind is prohibited.
10. Spilling or disposing of any pollutant is prohibited.
11. Grounding or causing to ground any vessel is prohibited.
12. Introduction of non-native species is prohibited.

Changes to restricted activities

The Advisory Council will review existing recommendations and consider any missing restrictions (e.g. aquaculture, sea cucumber harvest, yacht and ship passage and mooring, shipping lanes, commercial photography, dredging and mining, personal motorcraft, sportsfishing) as part of its annual review process.

Restrictions by Zone

Use / Zone	Permanent Conservation and Recreation Areas	General Tourist Recreation Area	Seasonal Closed Channel Areas	Exclusive resident use areas	Areas Managed for Coral Replenishment	General Use Area
Areas included	Ebiil / Ngerael / Telbadel ra Ngerael / Enjinkoto shoal / Clam Management Area			Subsistence Collection Area / Mangrove Management Area / Dugong Management Area		
General description	Restricted entry, No-take	Entry allowed, take for locals only	Restricted entry, Seasonal no-take. Commercial harvesting allowed.	Restricted take for Ngarchelong residents only. Restricted methods.	No entry, no-take	Open for entry, open for take. Commercial harvesting allowed.
Entry for Tourism	Restricted for all - guided tour only	Allowed	Restricted for visitors - guided tour only	Restricted for visitors - kayak or guided tours only	Prohibited	Allowed
Entry for Education	Restricted for all - must have guide/permit	Allowed	Allowed (yearly)	Allowed for residents	Restricted for all - must have guide/permit	Allowed
Subsistence harvesting	Prohibited	Residents allowed	Restricted - seasonal closure	Residents allowed. Mangrove take restricted to crab, clams and lumber.	Prohibited	Allowed
Commercial harvesting	Prohibited	Prohibited	Restricted - seasonal closure	Prohibited - Subsistence collection area. Residents allowed - Mangroves	Prohibited	Allowed
Gill Nets - Year 1	Prohibited	Allowed	Restricted - seasonal closure	Prohibited	Prohibited	Allowed

Gill Nets - Years 2-5	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
Use of flashlights while fishing	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
Trochus Harvesting	Prohibited	Residents allowed	Restricted - seasonal closure	Residents allowed	Prohibited	Allowed
Harvesting of clams	Prohibited	Prohibited	Prohibited	Residents allowed - Mangrove clams only	Prohibited	Prohibited
Selective lumber harvest	N/A	Prohibited (on islands)	N/A	Residents allowed	N/A	N/A
Harvest of mangrove crabs	N/A	N/A	N/A	Residents allowed - closed January to June	N/A	N/A
Monitoring and Research	Allowed with permission	Allowed with permission	Allowed with permission	Allowed with permission	Allowed with permission	Allowed with permission
Enforcement and surveillance	Allowed by authorized state and national personnel	Allowed by authorized state and national personnel	Allowed by authorized state and national personnel	Allowed by authorized state and national personnel	Allowed by authorized state and national personnel	Allowed by authorized state and national personnel

VII. PERMITTING PROCESSES

Specific activities are included in the First Year Work Plan and 5-Year Strategic Plan to develop permits and a permitting process. In the absence of an adopted permitting process, all activities requiring a permit or permission shall require simple written permission from the Governor. Email documentation of permission shall also constitute permission.

Permits or written permission are required for:

- Aquaculture
- Commercial photography
- Fishing
- Harvesting (animal or lumber)
- Tourism (Visiting)
- Tourism (Running or establishing a tour operation)

- Research
- Monitoring (some zones)
- Education (some zones)

The final permit process shall include:

- Cost of permit/fee
- Timing/duration of permit
- Number of people covered by permit
- Number of days covered by permit
- Number of sites covered by permit
- Uses allowed
- Application
- Instructions for applying for permit
- Instructions for approving permits
- Process for monitoring and assessing fees/fines associated with permits

VIII. LEGAL AUTHORITIES OF THIS PLAN

National Powers and Laws

The Constitution of the Republic of Palau delegates specific powers to state governments, and reserves all other powers to the national government. The states have been specifically granted “ownership” of its water resources within the water area surrounding its land (to 12 nautical miles). The Constitution specifically and significantly expands the scope of this ownership right by allowing the states to collect revenues with regard to the state’s water territory.

This Plan is in line with National Laws. The following is a list of national laws that impact the scope of the management plan:

<p>The Marine Protection Act of 2007 (27 P.N.C. § 1201-1211)</p>	<p>Limits domestic fishing</p> <ul style="list-style-type: none"> • limit the take, sale, purchase, and export of many species • closed seasons for grouper and rabbit fish, • minimum sizes for parrotfish, wrasse, crabs, and lobster • gear restrictions (prohibition on fishing with SCUBA gear and minimum and prohibitions on certain types and sizes of nets) • restricts the taking of aquarium fish • requires labeling of exports • authorizes additional regulations to protect certain species
<p>27 PNCA §§ 101-207</p>	<p>Limits foreign fishing within the 200 mile EEZ. Prohibits foreign fishing within Palau’s territorial sea and internal waters (generally 3 miles from a land baseline)</p>
<p>Endangered Species Act (24 P.N.C. § 1001-1012)</p>	<p>Prohibits any person from taking, engaging in commercial activity with, possessing, or exporting any endangered or threatened species of plant or animal.</p>

Protected Sea Life-Turtles (24 P.N.C. § 1201)	Limits seasons and size for sea turtle harvesting. Prohibits taking of eggs or harassment of females during egg-laying.
Hawksbill Sea Turtle Law	Places a 5-year moratorium on all harvest of Hawksbill Sea Turtles (2011-2015)
27 PNCA §§ 101-207	Limits foreign fishing within Palau’s 200 mile extended fishery zone. Foreign fishing is generally prohibited in Palau’s territorial sea or internal waters (waters up to three miles from the baseline).
Control of sponge harvesting (24 P.N.C. § 1211)	Limits harvest of sea sponges.
Mother-of-Pearl (24 P.N.C. § 1221)	Prohibits harvest of mother of pearl.
Dugong (24 P.N.C. § 1231)	Prohibits harvest or harassment of dugongs.
Trochus (24 P.N.C. § 1241-1246)	Controls trochus harvest.
Protected Land Life Act (24 PNCA § 1401)	Prohibits harvest or harassment of all but four bird species.
Title 24 Palau National Code Annotated (24 PNCA) (The Environmental Quality Protection Act)	Establishes general standards for environmental review and regulates earthmoving, water quality, air pollution, and environmental impact.
Historical and Cultural Preservation Act (Title 19) Palau Lagoon Monument (Chapter 3)	Protects culturally, historically, or archaeologically significant are eligible for protection. Chapter 3 protects underwater archaeological and historical tangible remains.

State Powers and Laws

There are numerous State Laws pertaining to marine and terrestrial resources, lands, and waters. This Plan includes an action for the State Attorney to review existing laws and determine if there are any legislative conflicts. This Plan is intended to supersede any previous statutes, thus this Plan also includes an action for the Governor and State Assembly to resolve any legislative conflicts with passage of new laws.

The authority to enact this plan emerges from Ngarchelong State Assembly Resolution No 13-17 which affirmed that the government and people of Ngarchelong have the authority and responsibility to develop a plan to manage the State’s resources. Executive Order No. 08-01 established the Advisory Council which helped to develop this document. The Ngarchelong State Constitution give Ngarchelong State the authority to enact resource management legislation. By state constitutional authority, management of nearshore marine resources is shared between the traditional leaders, state owners, and other national management bodies. This Plan does not impair traditional fishing rights or practices.

IX. PARTIES RESPONSIBLE FOR IMPLEMENTING THIS PLAN

Management Authority (Figure 3)

This Plan shall be implemented by the Office of the Governor, with ultimate executive responsibility resting with the Governor. Given the scope of the Plan, its budget, and intended activities, a unique

Conservation and Law Enforcement Division shall be created within the State Government. The State Assembly and Traditional Leadership shall form an advisory role and will be responsible for giving final approval for annual work plans and revisions to this Work Plan.

This Plan calls for the establishment of an Advisory Council with at least seven members to advise implementation, undertake planning, and approve all additional plans. The Advisory Council shall include at least one representative from:

- Office of the Governor
- Traditional Leaders
- State Assembly
- Palau International Coral Reef Center
- General Community (appointed by Governor)

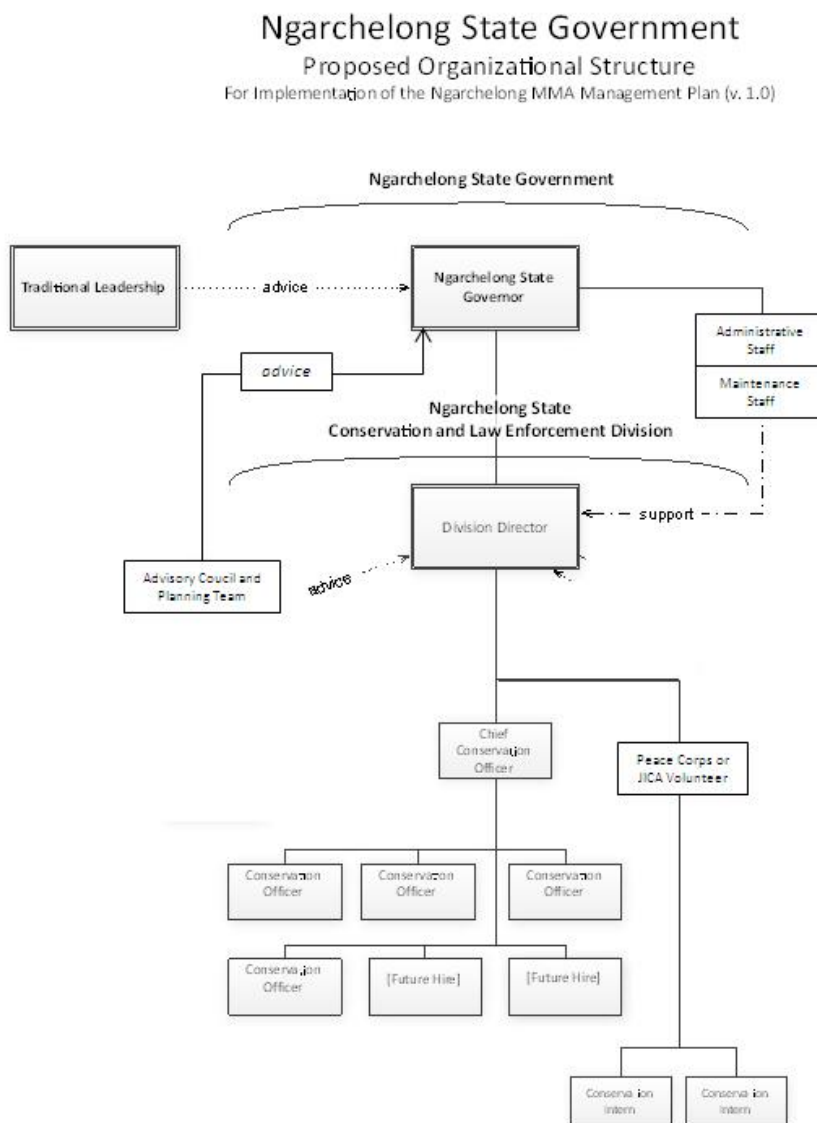


Figure 3. Planned personnel and authority structure

Management Personnel

This Plan calls for the immediate hiring of a Division Director and up to seven Conservation Officers. A Peace Corps or JICA Volunteer may also be recruited to assist with specific aspects of the Plan (such as creation of educational materials).

1. Division Director
2. Chief Conservation Officer
3. Conservation Officers (4 immediately; 6 by the end of 5 years)
4. Peace Corps or JICA Volunteer

This plan also intends to utilize the services of existing State personnel, including:

1. State Attorney
2. State Administrative Staff
3. State Maintenance Staff

Appendix 4 lists roles and responsibilities of all authorizes and personnel involved in this Management Plan in detail.

Duties of Management Personnel and Divisions

Office of Ngarchelong State Governor – The Governor’s office, as the executive body of the Ngarchelong State Government, will be responsible for oversight and supervision of the Ngarchelong State Conservation and Law Enforcement Division. The Governor shall hire and supervise staff, implement this Plan, enforce all provisions in this Plan and associated legislation, issue permits and permission, manage funds, make national budget requests, approve and issue expenditures, and approve all plans.

Traditional Leadership – Traditional Leaders will provide input and guidance to the Ngarchelong Conservation and Law Enforcement Division and State Government on issues of traditional values and practices connected to the marine environment, resource management, and conservation within the NMMA. Traditional Leaders will need to approve all associated plans within this Management Plan.

Advisory Council – The Advisory Council will provide advice and guidance to the Division Director and Governor on technical matters associated with this Plan (such as monitoring). Subgroups focused on monitoring and finance may be formed. The Advisory Council will need to approve all subsequent plans (Annual Work Plans, Communication and Outreach Plan; Surveillance, Compliance and Enforcement Plan; Tourism Development Plan; and Business and Sustainability Plan) and will lead the 5-year revision.

Ngarchelong State Conservation and Law Enforcement Division

This new division within the State government will be accountable for all law enforcement matters within the State and responsible for implementing and supporting natural resource management and conservation activities within the State. Initially its primary function will focus on the implementation of the Ngarchelong MMA Management Plan. However, Division staff, when fully trained and deputized, will be expected to assist with enforcement of all relevant State and National laws, rules, and regulations within the State on land or in the ocean.

Conservation and Law Enforcement Division Director – The Division Director is responsible for all operational aspects of the Ngarchelong MMA Program, including but not limited to: oversight and

management of personnel and program assets; enforcement activities; public awareness; reporting; planning; finance; and administration. Additionally, the Division Director will be the lead staff in coordinating Program communication and activities with various agencies, initiatives, organizations, advisors, and contractors upon the advice and guidance of the Governor and Advisory Council. The Division Director is also responsible for reporting on the achievement and progress towards program objectives and on NMMA Program finances, with the State Financial Officer, to the Advisory Council, the Governor, State Assembly and other agencies.

Chief Conservation Officer – The Chief Conservation Officer (CCO) will be responsible for supervising all aspects of field activities and interaction with the public, including residents and visitors.

Conservation Officers (initially 4 positions, additional 2 positions added in Year 4) – Conservation Officers (COs) are to be trained and formally deputized to enforce both State and National laws within the MMA, and broadly throughout the State’s jurisdiction. Conservation Officers are expected to interact with the public and visitors, and conduct routine daily management activities, as identified in the MMA’s current workplan.

Peace Corps Volunteers, JICA Volunteers, or Conservation Interns – These individuals may assist with important office, field, and community activities, resource monitoring, general reporting, and outreach and awareness activities.

State Administrative Staff– The State Financial Officer supports the Division Director in accounting for and reporting on program finances to State, National, NGO and international entities and donors as required.

State Maintenance Staff– State Maintenance Staff may assist with field activities.

State Attorney – The State Attorney shall develop permits, fees, fines, legislation, regulations, and all legal documents in this Plan.

X. PROCESS FOR REVIEWING THIS MANAGEMENT PLAN AND ASSOCIATED WORK PLANS

There are several planning activities in the next five years, such as the creation of Enforcement, Visitor, and Outreach plans. Additionally, PAN regulations require a written Annual Work Plan. Annual reviews of this Management Plan are also necessary, as is a thorough review and revision at the five-year mark. Thus, this Plan includes the establishment of a permanent Advisory Council.

The Division Director shall be responsible for generating annual reports that convey the progress of objectives in this Plan and which include a financial report. The Division Director shall incorporate all relevant monitoring and evaluation data and information into these reports.

Based on these reports, the Division Director shall draft annual work plans and a budget request and forward these to the Advisory Council for review. The Division Director shall also forward any recommendations for changes to this Management Plan to the Advisory Council.

The Advisory Council shall review, change, and approve the Work Plans and any changes to the Management Plan. Once the Advisory Council has approved the annual work plans and any changes to the Management Plan, they shall be forwarded to the Governor for review. Once the Governor has approved the annual work plans and changes to the Management Plan, they shall be adopted by signatures from the Chair of the Advisory Council and the Governor.

Near the close of the five year mark, the Advisory Council shall review and develop a revised Management Plan and then seek approval from the Governor, State Assembly, and Traditional Leaders. The Governor shall hold a public hearing on the proposed revised Plan.

Conflict resolution

In the case of conflicts between any parties in this Plan, the Governor, Advisory Council, or Division Director shall ask the Traditional Leaders for their advice. If necessary, any party may initiate facilitated meetings (with advice and facilitation provided by technical partners such as TNC or PCS) to assist with conflict resolution. The State Attorney shall be consulted on any conflicting legal matters.

XI. ADDITIONAL PLANS

Items that were considered for future plans are included as **Appendix 5**.

Definition and Inclusion of Community³

When this Plan refers to the Ngarchelong community, it includes all residents who 1) currently live in any of the villages in Ngarchelong, 2) have close family from or in Ngarchelong, 3) participate in Ngarchelong customs, and/or contribute to community work and service in Ngarchelong. In this Plan, the definition of community also includes individuals with a clear stake in Ngarchelong (such as owning land or operating a business).

Community activities will target or include all five Ngarchelong villages, or that representatives from all five villages will be included in activities. Community activities will include or target all relevant stakeholders.

PAN Membership

The Ebiil Conservation Area has been a member of the Palau Protected Areas Network (PAN) since 2008. This Plan includes an activity to nominate the entire NMMA as a PAN Site. The application to PAN shall highlight the superb features of the NMMA:

- An intact, large, and full marine ecosystem. The NMMA includes an entire reef system and thus includes ecosystem connectivity, corridors, and representative habitats.
- Spectacular and high levels of marine biodiversity.
- Resilience to climate change. The NMMA includes reefs that supply coral larvae to the rest of Palau.
- Its ability to support sustainable harvesting.

³ Note that the definition of resident and community vary. Community includes a broader audience, while Resident is restrictive.

- Large size, enabling Palau to better meet its Micronesia Challenge commitment of 30/20% marine/terrestrial protection.

The Governor shall submit a PAN application as soon as this Plan is approved.

The NMMA and Climate Change

Climate change poses numerous threats to the NMMA, including increasing sea surface temperatures (triggering coral bleaching), ocean acidification (causing animal and plant mortality), sea level rise (impacting all habitats, but particularly mangroves and seagrass beds close to shore), and increased impact from land-based activities, especially in the zones closest to land. The Subsistence Collection Area is of particular concern from land-based threats as all of Ngarchelong's streams drain into some portion of the area.

This Plan includes specific monitoring activities to track and judge the impact of climate changes on the NMMA.

In addition, areas in the NMMA have proven to be more resilient to climate change than other areas in Palau. The Area Managed for Coral Replenishment zone rebounded from massive bleaching in 1998 more quickly than other areas, and coral spawn from the zone helped coral reefs in other parts of Palau rebound from the bleaching. This zone was established for this reason and its uses are extremely restricted so that secondary threats are minimized.

Site Connectivity

The NMMA includes all territorial waters in Ngarchelong, so the NMMA exhibits ecosystem connectivity to the extent legally possible. Hydrodynamic studies have shown that Ngarchelong's water are connected to and impacted by waters and land in Ngaraard, Kayangel, and elsewhere. Ngarchelong will continue its membership in networking establishments such as the BWA so that it can continue working with other states to implement joint management of connected sites.

IUCN Category

Entire NMMA: CATEGORY VI – Managed Resource Protected Area

The NMMA will be managed mainly for the sustainable use of natural ecosystems. Area contains predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

SECTION B. BACKGROUND INFORMATION AND RATIONALE FOR THE PLAN

XII. DESCRIPTION OF THE PLANNING PROCESS

Ngarchelong began planning for its territorial areas in the 1990s. A 1996 Sustainable Development Plan helped guide this Management Plan. Planning for Palau's Northern Reefs has been a priority for Ngarchelong and its partners for many years, but particularly since 2000. There have been numerous activities, workshops, and meetings leading to this Plan.

The first formalized planning effort was in 2006, when technical partners from Palau participated in a Conservation Action Planning (CAP) workshop as part of The Nature Conservancy's Pacific Marine Ecosystem Program. During this first CAP workshop the team examined the entire Northern Reef system, including areas belonging to Kayangel and Ngarchelong.

A Northern Reefs Leadership Summit in 2008 resulted in the Mengellak Declaration, in which Ngarchelong's leaders mandated a written management plan. State Assembly Resolution No 13-17 and Executive Order No. 08-01 were also passed in late 2008. Executive Order No. 08-01 established a 13-member Planning Team in 2008:

- Yimnang Golbuu – Chairman
- Dorothy T. Ueda – Secretary
- Ghandi Ngirmidol - Treasurer
- Harper Skang – Program Coordinator
- Uong er Etei Victor Joseph – Member
- Rubasech Immanuel Maldangesang – Member
- Rimirch Hayes Ngiratereked – Member
- Obak ra Iyebukel Lorenzo Ngiramolau – Member
- Pastor Paulus Swei – Member
- Delegate Abraham Osima – Member
- Delegate Caleb Tekriu – Member
- Mr. Dwight Ngiraibai – Member
- Mr. Helbert Martin – Member

In February 2009 the Planning Team participated in the second iteration of the CAP process. The Planning Team agreed to restrict the scope of planning to areas traditionally and politically understood to be under the legal jurisdiction of Ngarchelong State. During this 2009 CAP, the Planning Team determined, refined, or prioritized 1) conservation targets and their viability, 2) threats, 3) a situational analysis, 4) one priority objective with strategies and actions, 5) measures and monitoring indicators, and 6) a capacity assessment.

In 2009, with funding assistance from the German LifeWeb Initiative, Ngarchelong State contracted a consultant (Mike Guilbeaux) to facilitate the Planning Team as it developed this Plan. PCS assisted with coordination of the planning process. The team met repeatedly between 2009 and 2011 to derive content for the Plan. The Nature Conservancy (particularly Dr. Andrew Smith) provided extensive technical advice during this period. In late 2011, the Palau Conservation Society was contracted to write the Plan (in line with PAN criteria) using the content and directions derived by the Planning Team.

The final Plan was approved by the Planning Team. Activities in this Plan include seeking final approval and endorsement from Ngarchelong's leadership.

XIII. CONSERVATION TARGETS

Conservation targets include those species or features in the NMMA that the Planning Team wanted to conserve. More detail on targets is included in **Appendix 6**. Conservation targets of this Plan are:

Target	Viability Rank ⁴	Overall Level of Threat to Target ⁵
Economically valuable food fish <ul style="list-style-type: none"> • larger groupers (temekai, tiau) • large wrasse (maml) • parrotfish (e.g., kemedukl, otord) • snappers (e.g., kedesau, keremlal) • rabbitfish (bebael, beduut) • unicorn and surgeon fish (um, mesekuul, erangel) • emperor fish (melangmud, mechur) 	Fair	High
Economically valuable invertebrates, especially giant clams <ul style="list-style-type: none"> • giant clams (kim) • lobster (erabrukl) • sea cucumbers • trochus (semum) • mangrove crab and clam 	Fair (<i>CAP ranking refers to Giant Clams only</i>)	Medium (<i>CAP ranking refers to Giant Clams only</i>)
Seagrass beds	Fair	Medium
Fish spawning aggregations and associated channels/sites	Good	Medium
Coral communities and general marine biodiversity	Good (<i>CAP ranking refers to Dive Sites and Coral together</i>)	Low (<i>CAP ranking refers to Dive Sites and Coral together</i>)
Dive sites	Good (<i>CAP ranking refers to Dive Sites and Coral together</i>)	Low (<i>CAP ranking refers to Dive Sites and Coral together</i>)
Mangrove forests <ul style="list-style-type: none"> • mangrove crabs • mangrove clams flora • several bird species • reptiles (including the saltwater crocodile) • fish species 	Fair	Low
Upland forests	Very good	Low
Cultural and historical resources <ul style="list-style-type: none"> • Ship and plane wrecks 	Fair	Low

⁴ From the 2009 CAP. Viability Rank is an assessment of the target's health and helps identify priority targets on which to focus conservation attention.

⁵ From the 2009 CAP. Threat Status determines the level of influence from each individual threat and then determines the overall threat status per target.

XIV. THREATS TO TARGETS

Priority Threats

1. Overfishing (from Commercial and Subsistence fishing)
2. Poaching (from restricted areas)
3. Physical Damage to Coral (from tourist activities (snorkelers, divers), boating activities (anchors and direct hits), and ship groundings)

Additional Threats

1. Coral bleaching from climate change
2. Sea level rise, ocean acidification, and changing weather patterns from climate change
3. Land-based erosion and sedimentation from road building, habitat modification, earthmoving, forest burning, farming, and urban and commercial development (improperly planned or too rapid)
4. Land-based pollution (e.g. excess nutrients) from solid waste and other pollutants
5. Overcrowding from tourism
6. Crown of Thorns
7. Human disturbance (to historical sites)
8. Natural disturbance (to historical sites)

During the 2009 CAP, the greatest threat was Commercial Fishing because it impacted most targets with great severity (e.g. commercial fishing is causing the decline of most targets). The second greatest threat was climate change. Additional threats impacting multiple targets with high severity were sedimentation, tourist activities, subsistence fishing, and boating activities.

Internal Weaknesses and External Threats

During several brainstorming efforts to identify Strengths, Weaknesses, Opportunities, and Threats (SWOT) in multiple villages and with multiple stakeholders, the Ngarchelong community identified numerous threats, many of which are not related directly to a target. Several weaknesses and threats are process-based threats: they will possibly hinder the implementation of this Plan and thus were directly considered and addressed in this Plan. All identified weaknesses and threats are in Table x.

Weaknesses and Threats from multiple SWOT exercises in Ngarchelong (2009)

Internal	External
<p>Weaknesses</p> <ul style="list-style-type: none"> • Carelessness • Economic hard times • Lack of (or degraded) traditional values and practices. • Lack of conservation ethics • Limited awareness • Limited conservation education • Limited employment opportunities • Limited law enforcement (no deputized officers, no patrol boat, no equipment) • Limited money and funding • Limited resources (human, equipment, knowledge, and funding) • No regulations or missing legislation • Overfishing • Unsustainable fishing practices 	<p>Threats</p> <ul style="list-style-type: none"> • Boating activities • Climate Change • Consumer demand (restaurants, hotels, exports) • Customary practices • Foreign fishing vessels • Foreign investors • Illegal fishing (SCUBA, etc) • Marine debris • Mass development • Modern fishing technologies • National and state politics • National development projects • Neighboring state boundary issues • Non-resident fishing • Oil spills from vessels • Outside investors and investment opportunities • Poachers • Road Construction • Ship grounding • Tourist impact • Trash and littering • Unregulated development • Unsustainable development

Brainstorming activities in Ngarchelong’s villages also resulted in ideas for solutions to these threats. The zones, restrictions, and activities in this Plan are based on these community-identified threats and solutions.

XV. RATIONALE FOR PLAN ACTIVITIES AND RESTRICTIONS BASED ON TARGETS AND THREATS⁶

Food fish were selected as targets due to the importance of these reef food fishes to the commercial (fishing and tourism) and subsistence economies of Ngarchelong, and the population decline in recent years.

- The Viability Rank is Fair because the current status of the abundance of fish is poor and the number and size of fish are fair (out of poor, fair, good, and very good).
- Threats are poaching, commercial fishing, climate change, and subsistence fishing.
- This Plan includes many zones and restricted activities focused on food fish and an Area Managed for Coral Replenishment so that coral resources (important for food for fish) are protected, even in the face of climate change.

Invertebrates, especially Giant Clams were selected as targets because Ngarchelong is well known for its populations of giant clams and it is the state signature animal. The high demand for giant clams generated by subsistence and commercial uses has led to significant declines in the populations of giant clams in the reefs around Ngarchelong. Giant clams have a cultural association with Ngarchelong State and high commercial and subsistence value.

- The Viability Rank for giant clams is Fair because the current number of clams is poor and the size is fair.

⁶ Information on viability ranks and threats is from the 2009 CAP.

- Threats to giant clams are poaching, commercial fishing, climate change, and subsistence fishing.
- This Plan includes Clam Management Area zones and specific clam replanting activities. This Plan also includes numerous restrictions and zones focused on controlling the harvest of other invertebrates.

Seagrass beds were selected as targets due to their importance in providing habitat for many subsistence and commercially important species of fish and invertebrates, such as sea cucumber, as food for a number of endangered species, and as well as primary habitat for many reef fish and juvenile fish, including the sought-after rabbitfish, mullet, snappers, and parrotfish.

- The Viability Rank is Fair because the current number of economically important species in seagrass and the aerial extent of beds are fair.
- Threats are commercial fishing, sedimentation, subsistence fishing, and boating activities.
- This Plan includes seagrass beds in the Subsistence Collection Area and General Tourist Recreation Area zones, both of which restrict harvesting and impacts.

Fish spawning aggregations and associated channels/sites were selected as targets because of their importance to food fish and because they have exceptional coral cover and diversity.

- The Viability Rank is Good because the number of fish species aggregating is good.
- Threats are poaching, commercial fishing, climate change, tourist activities, boating activities, and Crown of Thorns.
- This Plan restricts activities in all aggregation sites and channels. Mooring buoys will be placed in these zones.

Coral communities and general marine biodiversity and **Dive Sites** were selected as targets because the importance of corals to the reef system and because coral reefs, marine biodiversity, and dive sites are important economically.

- The Viability Rank is Very Good because the percentage cover and number of coral genus present is very good.
- Threats are poaching, commercial fishing, climate change, tourist activities, and ship grounding.
- This Plan restricts activities and prohibits harvesting in most sites with high coral cover and marine biodiversity.

Mangrove forests were selected as targets due to their importance in shoreline protection, as a buffer and sediment traps, and as biologically extremely productive areas (key nursery areas for many marine resources).

- The Viability Rank is Fair because the number of economically important species and the number of mangrove clams is fair.
- Threats are commercial fishing, sedimentation, subsistence fishing, and boating activities.
- This Plan includes a Mangrove Management Area zone with numerous harvesting, entry, and use restrictions.

Upland forests were selected as targets to maintain water quality entering the NMMA and to maintain terrestrial biodiversity that is ecologically connected to the NMMA.

- The Viability Rank is Very Good because the aerial extent is very good.

- Threats are farming activities and urban and commercial development.
- This Plan includes activities to identify ways to reduce sedimentation and to align development permits on land to the objectives of the NMMA.

Cultural and historical resources were selected as targets due to their cultural and historical significance to the people of Ngarchelong and for their value in attracting visitors to the state.

- The Viability Rank is Fair because site integrity is fair.
- Threats are human disturbance and natural disturbance.
- This Plan prohibits taking or damage to cultural and historical resources and places known ones in the restrictive Conservation and Recreational Area zone.

XVI. SOCIOECONOMIC, CULTURAL, AND BIOPHYSICAL INFORMATION

Location, Size, and Ownership

The Republic of Palau comprises a curved archipelago of approximately 350 islands lying between 4 and 8 degrees North latitude and between 131 and 135 degrees East longitude, at the western edge of the Caroline Islands, in a cultural region known as Micronesia.

The high island of Babeldaob covers 334 km². Ngarchelong State occupies the northern half of the peninsula at the north end of Babeldaob (**Figure 4**). The State landmass is about six km from north to south, and 0.5 to 2.5 km wide, with a land area of about 12 km². Two small and uninhabited limestone/coral islands lie one and two km northward.

The State's water area is estimated at 197.4 km², comprising the entire NMMA.

Under the Palau Constitution, all waters out to 12 nautical miles (comprising the entire NMMA) belong to the State. Thus the entire NMMA is owned by the Ngarchelong State Government, subject to traditional use rights.

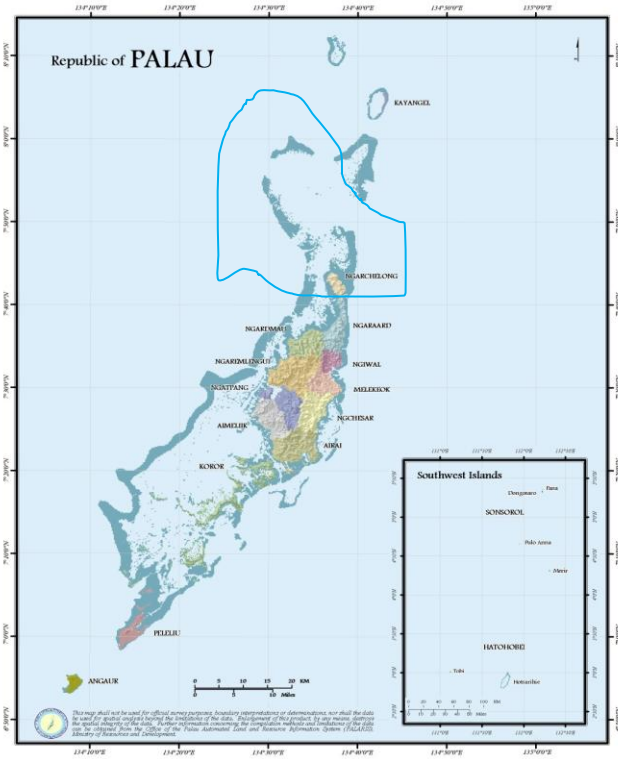


Figure 4. Map of Palau, showing Ngarchelong State and the NMMA (boundaries are not exact).

Current Resource Use and Cover

Infrastructure

There are small boat harbors and concrete jetties at Ollei and Oketol on the west and Ngerelau on the east side. Ollei, a community whose history differs in important respects from those of either Ngarchelong communities, is physically quite separate. It is located so as to gain direct access to the vast reef and lagoon area of the north.

Fishing and harvesting

The NMMA is used by residents of Ngarchelong and other states for fishing. According to a 2000 report, Ngarchelong was one of the three largest fish producing states in the Republic (JICA 2000). The section with socioeconomic information gives estimates of fish catch.

A 2006 survey of the Northern Reefs by PCS and CRRF found that certain fish are unevenly distributed over the reefs (**Figure 5**). Fish surveyed included economically important species: Parrotfish, Surgeonfish, Rabbitfish, Emperors, Sweetlips, Kemedukl, Maml, Cherangel, Chum, Kedesau, Keremlal, Tiau, Ksau, and Meteungerel.

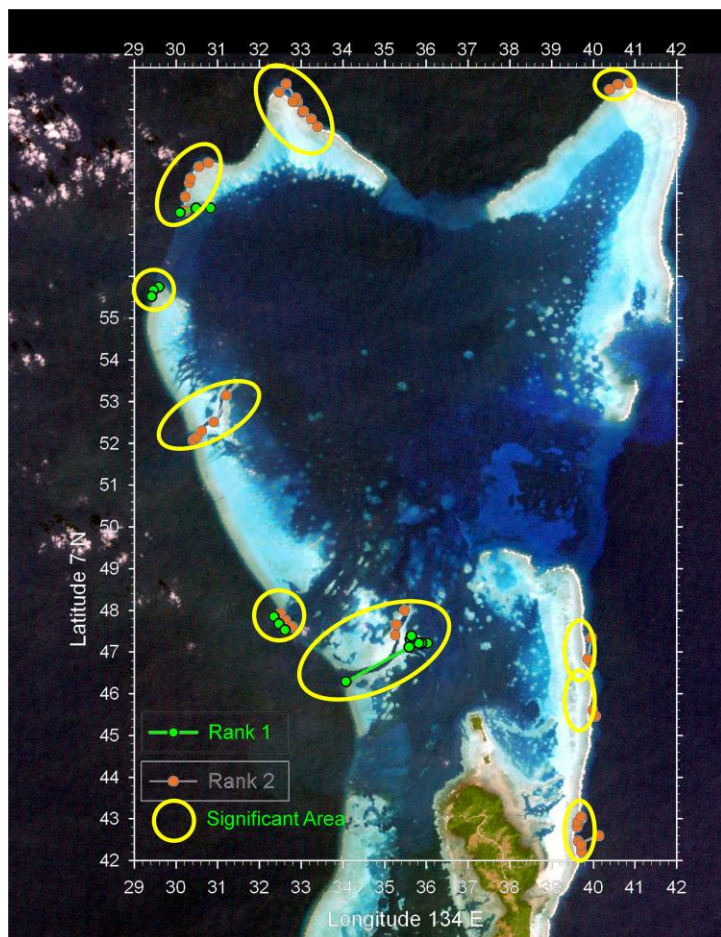


Figure 5. Areas with high fish abundance and species present.

Tourism and Visitation

There is some dive tourism in the NMMA. Live Aboard vessels occasionally visit the NMMA for several days of diving. Ngarchelong has offered an exclusive contract to a dive operation to operate out of one of the state’s docks. The operation runs daily speedboat tours to dive sites. These dive operations are always guided. On occasion, dive operators in Koror have offered one-day dive tours of the NMMA. The exact number of divers using the NMMA is unknown. The State does require a \$15 permit to visit the state’s reefs, but it is not clear if every user is currently purchasing a permit.

The reefs in the NMMA are known to have high fish populations and marine biodiversity and are in pristine shape. There is also a World War II wreck in the NMMA. These make the NMMA attractive to tourists. The 2006 survey of the Northern Reefs by PCS and CRRF identified potential tourist sites, based on their appearance and possible interest to tourists (**Figure 6**).

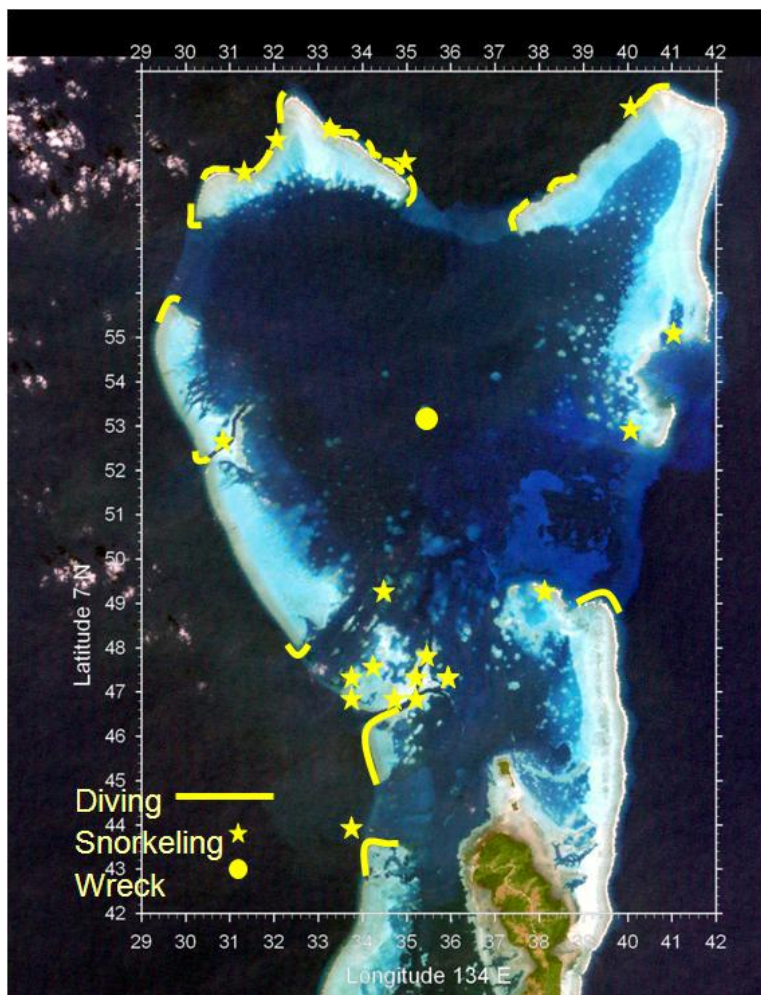


Figure 6. Areas of potential interest to tourists.

Ebiil Conservation Area is a popular site for visitation by school groups and special guests to Palau.

There are several on-land attractions in Ngarchelong and tourism to the state appears to be growing. Although there are currently no hotels or tourist lodging, there are plans to expand all tourist offerings in the state.

Sportsfishing

Although the level of pressure and effort from sportsfishing is not known, sportsfishers do target the NMMA for fishing. Many sportsfishing tournaments require fish to be taken out of the waters (rather than catch and release). Sportsfishing tournaments have been sponsored by Ngarchelong State and by organizations based in Koror.

Passage

All boats traveling to Kayangel from other locations in Koror pass through the NMMA. Large ships traveling north/south in Palau may also pass through the open ocean waters of the NMMA. The level of ship traffic is unknown.

Aquaculture

There are pens for giant clam aquaculture within the NMMA. These are owned and operated by individuals.

Biological and Ecological Information

The lagoon receives a little terrigenous (sediments that are derived from the erosion of rocks on land) influence from the rivers. The coastal reefs are bordered in many places by small mangroves. Intermediate reefs are more abundant in the northern area. The eastern reefs and all backreefs are very sandy (Freidman et al. 2009)

Several previous studies of coral composition, community structure, geomorphology and ecological status and condition of reefs around Palau have been conducted since the 1970s, notably by Randall (1990, 1995), Maragos (1992), and others. More recently, in 2001, the Palau International Coral Reef Center (PICRC) began a national long-term coral reef monitoring program to examine the general condition of reefs and to monitor recovery from disturbances, notably the 1998 bleaching event (Golbuu et al. 2007). These authors reported that reefs of Palau are now in a recovering phase following the 1998 event:

“... between 1992 and 2001, coral cover had dropped from 50-70% to 14-23% at the western slopes of the Northern Lagoon, the patch reefs and channels in West Babeldaob, the barrier reefs both in the East Babeldaob and around the Southern Lagoon, and at Ngerumekaol. In contrast, cover remained similar in Kayangel, the fringing reefs of both West and East Babeldaob, and the Northeastern slopes of the Northern Lagoon. Mean coral cover was estimated as 26% throughout Palau. The longterm monitoring program data showed that coral cover increased by a mean of 2.9% annually... if reefs are not under human stress from sedimentation and overfishing, corals will be able to reestablish naturally over time (in this case, within 12 years), even from a major disturbance such as the 1998 bleaching event. Therefore, management in Palau should focus efforts and activities on human induced changes that can affect the ability of coral reefs to recover” (Golbuu et al. 2007).

PICRC Researchers also found that: “lack of enforcement continues to be one of the major hindrances to effective resource management outcomes and more support is necessary” (Golbuu et al. 2008).

Coral Reefs (including channel passes and promontories, patch reefs)

The habitat was found to be generally healthy, with good representation of different substrate types and live coral. Moreover, differences were detected among the four reef habitats. At both coastal and intermediate reefs, the general status of corals was on average fairly good, however very poor at some sites, with coral rubble covered in encrusting brown sponges, algae and turfs. Better coral coverage was found in front of the northern islands, with many table and branching corals. Back-reef slope was poor in corals, degrading into sandy depths. On the outer reef, coral coverage was rather high in the shallow-reef-flat, with many soft corals (*Lemnalia*), branching *Pocillopora* and tabulate *Acropora*. However, at this habitat coral cover varied, with areas of barren bedrock and rock boulders covered with turfs and encrusting algae mixed with areas with higher coral cover of massive and submassive *Porites* and tabulate, encrusting and digitate corals abundant, especially below 20 m (PROCFish 2009).

Conservation status remains high, under a variety of criteria, including species richness, coral cover and replenishment potential. In respect of species richness, seven of the 29 stations had > 140 hermatypic species present, high by world standards. Other stations had high cover of living corals, and / or scored highly for replenishment. Station 11, 'Acropora reef' is of particular note for its exceptional ecological condition. These stations are widespread across the survey area, indicating that Palau's northern reef tract more generally remains of high conservation value (Turak 2009).

Coral Replenishment

Sites with high coral diversity, abundance, and live cover were considered crucial for the maintenance and replenishment of populations. These were ranked using a simple coral replenishment index (CI). The relatively high coral cover and levels of diversity of some sites provide them with high replenishment potential, contributing to possible resilience. Sites with highest CI scores included 'Acropora reef' (Site 11), Ollie Port W barrier inner (Site 8.2), Ngebard front central (Site 5.1), Ollie Port W barrier outer (Site 7.1) and TochelierraNgebard, inner south edge (Site 29.2) (Turak 2009).

Reef Fish

The assessment indicated that the status of finfish resources in Ngarchelong at the time of surveys was average. Overall, Ngarchelong appeared to support a relatively good finfish resource, with second highest density, biomass, average size and biodiversity among four sites in Palau, where recorded values were surpassed only by Koror reefs. Size ratio was however the lowest recorded. Detailed assessment at family level revealed a dominance of Acanthuridae and Scaridae in terms of density and biomass of the fish community. These two families were represented by a total of 48 species dominated by *Ctenochaetus striatus*, *Lutjanus gibbus*, *Chlorurus sordidus*, *Acanthurus lineatus*, *A. nigricauda*, *Hipposcarus longiceps*, *Nasolituratus* and *Scarus dimidiatus*. Concerns noted: Large-sized species of parrotfish (*Scarus altipinnis*, *Chlorurus microrhinos*, *Hipposcarus longiceps*) were only rarely observed; a total absence of large groupers and napoleon wrasses, as well as other carnivores was also noted: *Lutjanus gibbus* was present but very wary, and Lethrinidae (*Lethrinus sharak*, *L. xanthochilus*, *L. olivaceus*) were present only in small numbers; and apex (top of the food chain) predators were also extremely rare. Fishers had already exploited the Ebiil Channel reserve area as well as areas located much further to the north. A general lack or serious poverty of carnivores was the dominant profile among all reefs. However, in the analysis of the overall reef habitat, Lutjanidae were revealed as the most important carnivorous family in terms of biomass, with a slightly lower value than Scaridae. The study of size and size ratio trends disclosed the presence of smaller-than-average fish, indicating a first impact on some selected families of both herbivores and carnivores: Scaridae, Mullidae, Serranidae and especially Lethrinidae display overall small size ratios.

Similar to habitat conditions, finfish resources showed variability among the four reef types. The coastal reefs, although representing only less than 20% of the total reef area in Ngarchelong, were particularly rich in fish fauna (abundance, biomass, size and species diversity), although community composition was dominated by Acanthuridae. Reef fishing was done mainly for subsistence goals in this habitat. In contrast, the lagoon and back-reefs displayed the lowest values of density, biomass, average size and diversity. Average sizes of several families (Lethrinidae, Scaridae, Mullidae, Serranidae and Labridae) were much lower than the 50% of their maximum recorded value, indicating an impact from fishing on these targeted families. Fishing was in fact more intense on lagoon reefs and the mostly targeted families were Lethrinidae, followed by Lutjanidae, Serranidae and Scaridae. The outer reefs displayed intermediate conditions between coastal and lagoon reefs in Ngarchelong, but were relatively poor when compared to the outer reefs of the other country sites.

Giant Clams

Giant clams (Tridacnidae) are represented in Palau by seven species (*Tridacnagigas*, *T. derasa*, *T. squamosa*, *T. maxima*, *T. crocea*, *Hippopushippopus*, and *H. porcellanus*) distributed in shallow waters of the Palauan islands (Maragos et al. 1994a, 1994b). Giant clam meat is an important traditional food source in Palau. Fishing is mainly for subsistence, although surplus is often sold at the local market. Export of clam meat or whole shell collected from the wild is illegal. Assessment of the resource conducted around the main archipelago and the southwest islands revealed a declining population due to overexploitation (Maragos et al. 1994b; Birkeland et al. 2000). Palau was one of the first Pacific Island countries to develop a mariculture sector through the Micronesia Mariculture Demonstration Center, which was set up in 1973. Giant clam and trochus were the main species cultured by the centre for research into the potential of mariculture in the management of these resources. The centre has been producing thousands of giant clam seeds since the 1980s for restocking back on to the reefs of Palau. The main species cultured are *T. gigas*, *T. derasa*, *T. squamosa* and *H. hippopus*.

Recent data on clam distribution, density and shell size from the PROCfish surveys suggest the status of giant clams at Ngarchelong was healthy, especially for the most common species. Ngarchelong has a wide range of shallow-water reef habitats that are suitable for giant clams and in general a complete range of giant clam species was present, some of which are becoming rare in other parts of the Pacific. Clam density and the 'full' range of clam size classes present, support the assumption that, apart from some of the largest species, populations of giant clam are only partially impacted by fishing. There were few management issues to consider for the smaller species of clams (*Tridacna maxima* and *T. crocea*), and the larger clam species, although not at high density, have a better coverage here than at most other sites around the Pacific.

Sea Cucumbers

Ngarchelong has an extensive and diverse range of environments and depths suitable for sea cucumbers. Extensive reef margins and areas of shallow, mixed hard and soft benthos provided a range of suitable habitats for sea cucumbers. Shallow coastal and deep-water sheltered lagoon areas bordering the elevated land mass of Babeldaob and extending north are very suitable for supporting sea cucumbers, which feed on detritus and other organic matter in the upper few mm of bottom substrates.

The general indication from presence and density data collected in survey suggests that sea cucumbers are not under significant fishing pressure and stocks typically taken for commercial export are only lightly or moderately affected by past fishing. Results from assessments yielded 22 commercial species of sea cucumber. The range of sea cucumber species recorded at Ngarchelong is large, partially reflecting the varied environment, but also the fact that commercial export of sea cucumbers is currently prohibited in Palau. The species fished by domestic fishers for subsistence are more impacted. This is especially true for the more easily targeted (and depleted) species of local importance that are under higher pressure at locations to the south, and the larger inshore species of high value. For example, the high-value sandfish, *Holothuriascabra*, was found in 31% of soft-benthos stations at Ngarchelong. In the four stations where sandfish was recorded, the density was high (792–1792 individuals/ha), and a full range of size classes was noted. For additional information on the status of sea cucumbers as of 2008 please see PROCfish report 2009.

Trochus

Trochus (*Trochus niloticus*) is native to Palau and occurs throughout the archipelago; however, trochus are more abundant along eastern and north-eastern reefs and in the shallow west-facing reefs (Maragos et al. 1994b). Fishing for trochus is an old fishery in the Pacific region; in Palau it began in 1899 under the German occupation. Sale of trochus shells by local inhabitants of the Pacific Islands marks the initial commercialisation of fisheries resources that communities were involved in. As in other places in the region, Palauans started to earn money by selling their trochus shells and sea cucumbers to obtain money to buy imported products during the early trading years. Trochus remains an important resource in Palau, generating significant incomes for rural populations (Matthews 2003).

Harvests of trochus in the 1920s ranged from 200 to 360 mt; from the late 1920s to the 1970s, harvests fell to around 100 mt. This early fall in production resulted in the establishment of management systems of 'resting' stock between harvests since the 1980s. However, continued harvesting over the years has resulted in stock depletion (Nichols 1991). In 1992, following a three-year moratorium, fishers landed a total of 265.1 mt, with a dockside value of USD 645,000. This equated to 251.9 mt of cleaned and dried shell, which, when exported to Asian markets, brought in USD 1.1 million (Anon. 1996). The 1995 harvest was 428 mt with a dockside value of USD 1.8 million (Anon. 1996).

A stock assessment to allocate harvestable quantity in 2002 (Kitalong 2002) reported higher densities on the western reefs of Babeldaob and estimated total tonnage of harvestable sizes for Kayagel to Peleliu of around 2400 mt. The actual quantity taken out of this estimate is unknown and recent production data are not available. However, harvest production was reported to fall by 47 mt from 1989 (257 mt) to 2000 (210 mt) (Fitzpatrick and Donaldson 2007).

In summary, the distribution, density and length recordings of the commercial topshell suggest *Trochus niloticus* was relatively common at Ngarchelong. The density of trochus within the 'core' aggregations (where trochus are typically in greatest abundance) and across reefs in general suggests there is still significant potential for stocks to increase in number. Local reef conditions at Ngarchelong constitute an extensive and good habitat for juvenile and adult trochus. Commercial stock was common at easily accessible shallow-water reefs close to the main harbour, and on the lagoon-side back-reef at the barrier and near the passage. The exposed reef slope also held trochus, but no high-density aggregations were recorded. The majority of areas surveyed had not reached the 500 shells/ha that is considered to be the minimum threshold for considering commercial harvests. Size-class information also reveals that no strong year-class is currently visible below the commercial size-class range, and that past harvests have comprehensively fished the stock, as aggregations are holding very small numbers of large old shells (>11 cm basal width).

Other Species: Lobster, Mangrove Crab,

Two species of spiny rock lobster (*Panulirus penicillatus* and *P. versicolor*) are important in the subsistence and commercial fishery; other species are present but are of lesser importance. Commercial fishing of lobsters began in 1966 to supply the local market and resource assessment in the 1990s indicated the resource had suffered from overexploitation (Kitalong and Oiterong 1992). Production over a ten-year period from 1989 to 1998 varied from 9 to 25 mt (The Environment Inc. 2003) and recent data on stocks and landings are needed to verify existing information. Mud crab or mangrove crab (*Scylla serata*) is an important catch of the semi-commercial sector and is mainly produced from the mangrove habitats of the main island of Babeldaob. The state of Ngatpang is the

main supplier of crab, accounting for 40% of the country's harvest in the 1990s (Maragos et al. 1994b). Three species of land crab important in the subsistence fisheries are *Cardiosomahirtipes*, *C. cornifex* and *Gecorvoidealalandii* (Matthews 2003).

Significance of Ebiil Channel

The biological importance of the Ebiil Channel and surrounding coral reefs is known by fishermen and resource managers, and reported on in several publications (Maragos et al. 1994; Palau Conservation Society 2007). Results of studies indicate that approximately 50 different species of fish use Ebiil Channel as primary habitat, and many species of groupers and other fish migrate from surrounding waters to spawn there (Johannes 1994; Johannes et al. 1999). In addition to its importance as a significant spawning aggregation for several species of fish including temekai and tiau (Golbuu et al. in prep.; Palau Conservation Society / Society for the Conservation of Reef Fish Aggregations. In prep.), the Ebiil area also supports several other species of important food fish and marine invertebrates, such as trochus, clams, sea cucumbers and lobster. Coral diversity in the area is also high, with the number of different species numbering around roughly 240. Some coral areas exhibit unique qualities and are worthy of special management consideration. As a major spawning aggregation site, Ebiil Channel serves a key ecological role in the entire northern reef ecosystems and as such would play an important role in the functioning of the Palau Protected Area Network.

Mangroves

There are a total of 272 ha (680 ac) of mangrove forests in Ngarchelong, occurring in patches around the perimeter of the state.

Socioeconomic Characteristics

Socioeconomic fieldwork was carried out in the Desbedall and Ollei communities (in the following referred to as 'Ngarchelong') located on the northern part of Palau's main island in May – June 2007, as part of the SPCPROCFish project (Freidman et al. 2009).

Census / Fishers Characteristics

Results from recent demographic surveys conducted in 2007 indicate that the number of permanent residents* of Ngarchelong is 184 residing in approximately 53 households. Other individuals associated with Ngarchelong (those living in Koror, students attending school are not included in this figure). Livelihood activities in Ngarchelong comprise of gardening for home consumption, fishing and reef-gleaning for home and for market in Koror, and working for the State or national government. A low average household expenditure level, compared to other locations in Palau, suggests that people in Ngarchelong still enjoy a rather traditional lifestyle, which is supported to a great extent by subsistence production and non-monetary exchange of services and goods among community members. According to census data (1995) one (1) out of every three (3) persons over 16 years old in Ngarchelong was employed full-time (about 30 persons), and two (2) out of three (3) had engaged in subsistence production, however not necessarily full-time. Salaries provide 56% of households with first income; other sources, including retirement payments, welfare and handicrafts, provide 32% of all households with first and 4% of all households with second income. Only 12% of the households (or 6) indicated that fisheries are their first source of income, and another 24% quoted fisheries as a complementary secondary income source. Agriculture does not play an important role in generating income, accounting for 12% only: 4% as first and 8% as second source of revenue. Remittances from relatives resident elsewhere in Palau and overseas represent roughly a fourth of annual household expenditures, representing a significant economic contribution to the State.

Fishing Characteristics

In a 2007 fisheries survey of Ngarchelong (conducted in Ollie and Desbedall villages), it was estimated that of approximately 53 households in Ngarchelong State, 80% (or 42 households) are involved in reef fishing activities. Of these households, 61 individuals fish for reef fish (finfish) or collect invertebrates on a regular basis. Of the 36 male fishers, 30 fish for finfish exclusively and approximately 6 of male fishers fish for both finfish and invertebrates. No males specialize in only collecting invertebrates. Of the estimated 25 female fishers, 8 of females target exclusively finfish, 6 collect only invertebrates, and 11 of female fishers target both finfish and invertebrates.

It is estimated that 60% of all households in Ngarchelong own a boat. Of these 48 boats, 42 are motorized boats in which most fishing is done; the remaining 6 are non-motorised canoes or rafts. Finfish fishers mainly target the lagoon, but a quarter of all male fishers also fish the outer reef. The sheltered coastal reef is the least targeted habitat for finfish. Invertebrate collection focuses on soft benthos (seagrass) for bêche-de-mer and reeftop for giant clams. Mangrove gleaning and diving for lobsters are rarely done, and mainly performed by males. Handlining is the main fishing technique used in all habitats. However, handlining may be combined with trolling for pelagic fish at the outer reef, and with spear diving and gillnetting in the lagoon. Sea turtles are sometimes targeted or opportunistically caught during fishing outings.

Surveys indicate that all households consume fresh fish, and a majority (80%) also consumes invertebrates on a consistent basis. In Ngarchelong, the per capita consumption of fresh fish is estimated at $\sim 57 \pm 9.2$ kg/year and the per capita consumption of invertebrates (meat only) is estimated at ~ 10 kg/year. Finfish that is consumed is mostly caught by a member of the household, rarely bought, and yet often received as a gift. The proportion of invertebrates caught by a member of the household where consumed is lower. Invertebrates are also much less often bought or received as a gift in comparison to finfish. Finfish and invertebrates that are marketed mainly target urban markets in Koror, and to a lesser degree small markets in nearby Ngaraard or in Ngarchelong itself (for select invertebrates).

Surveys of Ngarchelong fishermen by the Ebiil Society in 2010 found that these men fish for many purposes: commercial sale, personal consumption, export off-island to friends and relatives, and for customs. Of the 33 fishermen surveyed, 15 reporting fishing for personal consumption and 8 fished for commercial sale. Fishermen reported using various reefs for fishing – in a single record (a day) during the 2010 survey 12 fishermen reporting using 9 different areas for fishing. Catch on a single day ranged from 10 to 80 pounds, with an average of 30 pounds. The level of non-resident fishing is unknown, but it is known that individuals and foreign fishing boats fish in Ngarchelong's nearshore and open ocean waters, including for tuna and live reef fish.

Several studies have indicated that fisheries catches and income from fishing have been declining for many years. These studies indicate that commercial fishing pressure and the use of modern fishing technology has increased in recent years.

Reeffish (Finfish) Catch

The total reported finfish catch from recent household surveys is 47.92 tons/year (PROCFish 2009). (Note this estimate only includes those reported in household surveys of Ngarchelong fishers; the estimate does not include illegal, unreported, underreported fishing, or fishing from external fishers). Of this catch, 22% was for subsistence corresponding to a total annual consumption of about 10.5 t.

and 78% or 37.4 tons/year for commercial sale. However, the community's subsistence needs are substantial: ~57 kg/person/year of finfish and ~10 kg/person/year of invertebrates. While more than half of finfish catches in Ngarchelong are sold outside the community, presumably to Koror, fishing pressure remains low due to the large area of fishing ground.

Typical finfish catches from the lagoon, the main habitat targeted, include the greatest variety of different fish species and species groups, with emperor fish determining 28%, and snappers accounting for another 17%, parrotfish (13%), followed by groupers (10%), Surgeon and unicorn fish (9%) and rabbitfish (>7%). Outer-reef catches mainly include emperor fish (39%), jacks (29%), groupers (21%) and snappers (13%). If the lagoon and the outer reef are jointly targeted in one fishing trip, grouper (*Epinephelus* spp.) (33%) and snapper (*Lutjanus gibbus*) (27%) determine most of the catch, with the remaining proportion due to snapper (*Lutjanus bohar*) and other emperor fish. Reported catches from the sheltered coastal reef are the least diversified and include only a very few species, such as the emperor fish *Lethrinus olivaceus* and *Lethrinus sharak* (PROCFish 2009).

Invertebrate Catch

Invertebrate collection focuses on seagrass and other soft benthos habitats for *bêche-de-mer*, one of the major target species for subsistence or local sale, and reeftop for giant clams, trochus, and some sea urchins. Mangrove gleaning (for crabs and clams) and diving for lobsters are done, and mainly performed by males. The total annual catch volume for all invertebrates expressed in wet weight is estimated at 10.6 tons/year. Of the total invertebrate catch, most invertebrate fisheries serve subsistence purposes, estimated at 6849 kg wet weight/year. However, the share of invertebrate catch sold, 3750 kg wet weight/year, is substantial and reaches about half of the subsistence demand.

Average annual catches of 650–700 kg/fisher/year by wet weight occur for seagrass harvesting, the main habitat for *bêche-de-mer*. These include harvests of mainly *Holothuria* spp., *H. scabra*, *Stichopus* spp. and *Actinopyga* spp. While catches from seagrass are mainly taken by female fishers, males' and females' contributions to annual catches reported for reeftop gleaning are similar. The reeftop (e.g. clam) fishery provides 200–350 kg/fisher/year. Lobster diving produces 150 kg/fisher/year wet weight, while overall catch rates from mangrove areas are low, but are important sources of income for individual fishers. (PROCFish 2009) In addition, it should be borne in mind that as with the reported finfish catches above, external and visiting fishers may add further pressure. Information on recent trochus harvest levels, an important fishery for the entire state, is not included here at this time.

A socioeconomic survey of 194 Ngarchelong residents in 2006 and 2007 by PCS and KKA found Giant Clams were believed to be declining. Most residents believed they were being overharvested. Residents reported that harvesting of trochus was still viable and important economically.

National Characteristics

Governance

Ngarchelong is one of 16 states of the Republic of Palau. The Palau government is headed by the president, the executive, and two houses of national congress, the OEK, which approves laws. A Council of Chiefs, comprising the highest traditional chiefs from each of the 16 states, is an advisory body to the president on matters concerning traditional laws and customs. Within the government are various agencies lead by ministers appointed by the President. These agencies have various responsibilities and authority ranging from health, economic development, education and law

enforcement. States, based on the approximate the jurisdictions and groupings of traditional villages, have their own constitution and government structure. In Ngarchelong, there is an elected governor and state Assembly that is made up both traditional leaders and elected officials.

Economy

In Palau, the economy is generally dominated by the service sector, which contributes over 50% of GDP and employs half of the work force. The government employs 25% of workers and accounts for 23% of the GDP (Wikipedia 2010). One of the government's main responsibilities is administering external assistance. Under the terms of the Compact of Free Association with the US, Palau is receiving a total of more than USD 450 million in assistance over 15 years and is eligible to participate in more than 40 federal programs. The first grant of USD 142 million was received in 1994 and further payments in lesser amounts will be made annually through 2009. In 2006 Palau received a total of USD 23.7 million in grant income (Wikipedia 2010).

Tourism

Tourism is Palau's main industry. Its major attractions are its diverse and pristine marine environment and its tropical island beauty. Visitor arrival in 2006 totaled 100,000, 15% more than the previous year, and 75% were from Taiwan, Japan, and the US. The growing number of visitors is attributed to the reliable direct flights from Philippines, Taiwan and Guam. The government realizes the importance of tourism and provides strong support for the sector with hopes that it will provide a stimulus for other economic activities in Palau. The industry derived USD 67 million or 47% of the Gross Domestic Product (GDP) in 1996 (ADB 2005). The value of tourism in 2002 was USD 66 million (Wikipedia 2008). The construction industry, including the new Compact Road development, relocation of the new capital, and new hotels, have boosted this sector's recent contribution to over 15% of GDP. The agriculture sector is represented by subsistence cultivation of coconuts, taro and bananas for food security and surplus for sale locally. The Compact of Free Association created a trust fund to provide perennial budget support when US direct assistance ends in 2009. The value of the trust fund in 2005 was approximately USD 150 million.

Fisheries

Fisheries contribution to the GDP of Palau was about 8% in 1998 (FAO 2008; Gillett 2002). However, Gillett and Lightfoot (2001) presented a drop in fisheries contribution to GDP for Palau from 4.1% in 1995 to 2.8% in 1999. Although substantial, this has declined dramatically in the last 10 years, partly due to a decline in the locally based longline fishery and strong growth in the tourism sector. The fisheries sector, however, still dominates commodity exports for Palau, mainly tuna and reef fisheries products. In 1995, Palau exported 2500 mt of tuna at an estimated value of USD 12.5 million. Coastal reef fisheries today are more important for food security. About 1100 Palauans are subsistence fishers and 200 are commercial fishers (FAO 2008). The inshore fishery is critical to Palau's domestic food supply. The current challenge for inshore fisheries is centered around balancing exploitation rates of resources for subsistence and commercial activities with maintaining a healthy ecosystem and the fisheries resources.

Finfish from reefs and lagoons comprise a large portion of the catch of the subsistence and semi-commercial reef-fishery sector in Palau. As is the case with other island countries in the region, the reef-fish fishery of Palau is a multi-species and multigear fishery. About 80 species of reef fish from 13 families are involved in the fishery including snappers (Lutjanidae), emperors (Lethrinidae), groupers (Serranidae), parrotfish (Scaridae), wrasses (Labridae), rabbitfish (Siganidae), surgeonfish (Acanthuridae), trevallies (Carangidae) and herrings (Clupeidae) (Nichols 1991). Dominant individual

species that support reef fish fisheries in the 1980s included *Siganuscanaliculatus*, *Epinephelus fuscoguttatus*, *E. microdon*, *Plectropomusareolatus*, *P. leopardus*, *Cetoscarus bicolor*, *Hipposcaruslongiceps*, *Scarusspinus*, *S. ghobban*, *Bolbometoponmuricatum* and *Chelinus undulates* (Nichols 1991, Kitalong 1991).

XVII. CONCLUSIONS

The Ngarchelong Marine Managed Area is one of the most pristine and diverse marine environments in Palau. Relative to other locations in Palau, it is relatively unimpacted and offers an excellent opportunity for sustainable management. This Plan conveys the commitment of the Ngarchelong community and leaders to maintain the natural and cultural resources in the NMMA for current and future generations.

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Appendix 1. Information for use in drafting rules and regulations

The following section presents a description of the Ngarchelong Marine Managed Area definitions and rules developed to support the Management Plan's goals and objectives. This set of rules and zoning system outlined below is designed to be in effect indefinitely; however, after a period of five years, these rules, along with all other aspects of this plan (e.g. activities, monitoring indicators, budgets, etc...), are scheduled to be reviewed and reaffirmed or revised, by the Advisory Council, Governor and others as appropriate. Customary tenure systems and traditional management practices related to the natural resources of Ngarchelong will remain unchanged by this Management Plan.

Suggested Definitions

Resident of Ngarchelong: For purpose of the implementation of this Plan and the enforcement of its provisions, the “customary definition” or common understanding of a “resident of Ngarchelong” will be used. Thus, a resident of Ngarchelong is defined as a person who 1) currently lives in Ngarchelong, 2) has family from or in Ngarchelong, 3) participates in Ngarchelong customs, and/or 4) contributes to community work and service. A person fulfilling any one of these requirements for any period of time may be considered a “resident of Ngarchelong”. Conversely, a person not fulfilling at least one of these requirements is not to be considered a “resident of Ngarchelong” for the purposes of this Plan.

Permit: For the purposes of this plan a permit is a written document for allowed activities.

Boat Registration: A process of documenting the identify of a boat or watercraft by recording the size, type, manufacturer, year, owner and other characteristics of a boat or watercraft for the purposes of identification. Boats will be registered by the boat owner and be required to show identification numbers/tags as determined by State Legislature/Ngarchelong Conservation and Law Enforcement /Governor. Information on boats registered within the State of Ngarchelong will be kept on file by the Ngarchelong MMA management team.

Fishing License: For the purposes of this Plan, a license will refer to granting of authority and benefits to use or access a fishery with certain restrictions. Licenses will be of 1 year durations and can be revoked upon violation.

*A Palauan Fisherman not defined as a resident of Ngarchelong can fish in Ngarchelong states waters as long as they get a “non-resident license”(\$20).

**“Not for commercial”; have to check in and check out; Good for 1 day within a 10 day window (to allow for bad weather, etc). Can not take out more than 200lbs fish (doesn't not include turtle) a day per boat.

Commercial fishing: Needs definition.***

Daily limits: Needs definition.***

*** The Planning Team decided to not to prescribe rules for commercial vs subsistence for at least 1 year. But the planning group commits to revisiting this issue after one year with the data provided by conservation officers.

Commercial Fishermen: These people are out not to feed their families but to make a business out of reef.

Suggested Rules

Rule 1: Any boat that operates Ngarchelong State waters (except for innocent passage) is required to have an up-to-date, official registration from a State Government of the Republic of Palau (eg Koror State). If the home state of a boat owner does not offer boat registration, the boat can be registered with the State of Ngarchelong. Fee for registration will be basic (eg \$3/year); just to cover the costs of the registration program.

Rule 2: Every fisher/harvester will be required a fishing license. Initially licensing will be general and allow all legal fishing activities. Additional restrictions may be placed on licenses at additional time as determined by the Advisory Council and/or State Assembly and Governor.

License (per person) rates will depend on residency and type (amount) of fishing:

- Ngarchelong resident: suggested rate \$2/year;
- Non-resident suggested rate \$15 (must check and out at dock for inspection/monitoring purposes);
- Commercial fisherman (must check in and check out at dock for inspection/monitoring purposes)(current definition of commercial for reef fishing only: \$100/month or \$500/QRT
*may need to clarify this definition depending on workability/enforceability)

Rule 3: No Flashlight fishing. Fishing at night with flashlights has been identified by the Advisory Council as a very destructive and eventually unsustainable method of fishing that is likely contributing to the decline of some local fish populations. Therefore, for the time being, this method of fishing will be strictly prohibited.

Rule 4: No Use of Gillnets: Members of the community recognize fishing with nets (commonly referred to as gillnets) is a very efficient and potentially destructive form of fishing. Hence for the protection of current and future fish stocks, the Advisory Council decided to prescribe no gillnet use in the entire area. This rule would not be in effect until 2012.

Allowable Activities (from Ebiil Management Plan)

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 Ebiil Conservation Area should be encouraged. Research (both environmental and social) will be allowed within Ebiil Conservation Area. Topics of research should be discussed and proposed by the State Assembly, the Governor, Program Staff and project partners to form a Research Agenda, then presented to interested researchers. Research must comply with state and national guidelines. Permits for any research within the Ebiil Conservation Area are required from the Governor. Reports and other requested information shall be provided to Ngarchelong State.

Monitoring and Evaluation: Monitoring of the Ebiil Conservation Area 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 activities should be selected sparingly, use native organisms if necessary, minimize disruption of the natural environment as much as possible, and have a net positive benefit to the environmental condition of the area. Such activities require a written permit from the Governor.

Educational and Awareness: Visits to the Ebiil Conservation Area 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 must accompany all groups.

Tourism: Tourism compatible with the overall management goal and objectives of the Conservation Area 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 Ebiil Conservation Area is 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 conservation area is 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.

Appendix 2. First-Year Work Plan

Objective/Activity	General Strategy	Lead	Supporting Individuals	Indicator of success	How measured	Year 1 cost	Year 1 cost description
Objective 1: Maintain culturally and economically important fish and invertebrate populations							
Publicly communicate Management Plan and any new rules (Public hearings, signs, newspaper releases/advertisements)	Education, Awareness, and Outreach	Governor	Admin Staff	Public hearings held; Community aware of rules	Records of meetings	300	Radio and newspaper announcements
Conduct daily surveillance through a combination of active patrolling by boat and remote surveillance methods (e.g., remote binoculars, night vision)	Enforcement and Surveillance	Conservation Officers		Knowledge and recording of violation incidents.	Enforcement and surveillance logbooks	N/A	Included in recurring and capital assets.
Undertake appropriate enforcement and legal action when violations are identified	Enforcement and Surveillance	Conservation Officers	State Attorney	Lower incidence of violations/Increased probability of effective prosecution of violations	Enforcement and surveillance logbooks	N/A	Included in recurring and capital assets
Objective 2: Maintain the health and quality of important and sensitive habitats and sites							
Formally protect sensitive areas by adopting this Management Plan and promulgating associated rules and regulations to control/restrict activities in them; otherwise formalize restrictions and prohibitions	Administration and Regulatory	Governor	Division Director and State Attorney	Plan adopted, rules and regulations promulgated	Copies of legislation	200	Meetings with food
Enforce rules of the Plan by restricting permits and development that will negatively impact sensitive sites (e.g. dredging or sedimentation)	Administration and Regulatory	Governor	State Admin Staff	No permits issued for sensitive areas; Fewer sites negatively impacted	Monitoring data and reports / Review of permits	N/A	Included in recurring and capital assets
Enforce rules of the plan in situ (e.g. by checking diver permits, intercepting boats in sensitive areas)	Enforcement and Surveillance	Conservation Officers		Daily log books record interceptions	Daily enforcement logs	N/A	Included in recurring and capital assets
Actively supervise tourism activities in sensitive habitats	Enforcement and Surveillance	Conservation Officers	Tour Guides	Visitors are accompanied by trained officers/guides at all times	Daily enforcement logs	N/A	Included in recurring and capital assets

Objective/Activity	General Strategy	Lead	Supporting Individuals	Indicator of success	How measured	Year 1 cost	Year 1 cost description
Identify and implement on-land activities to reduce pollution and sediment entering the marine environment	Maintenance and on-the-ground	Division Director	Technical Partners	Meetings held/ Activities implemented / Reduced sedimentation; increased water quality.	Meeting minutes	N/A	Included in recurring and capital assets
Objective 3: Initiate and complete a comprehensive Tourism Planning and Development process that results in increased tourism							
Secure funding for a Tourism Planner / Consultant to assist with development of NMMA Visitor Program and Plan	Administration and Regulatory	Governor	Division Director	Planner /Consultant contracted	Copy of contract	N/A	Included in recurring and capital assets
Formulate and implement an NMMA Visitor Program and Plan with: suggested laws and policies; appropriate permitting, user-fees, and processing systems for allowable activities; guidelines for visitor education and awareness; guidelines and targets for promotion; reporting system; fundraising plan, etc.	Administration and Regulatory	Division Director	Technical Partners/Consultants	Plan developed and adopted	Copy of Plan	20000	Contract for Visitor Program and Plan
Objective 4: Develop an effective Compliance and Enforcement program that reduces illegal activities within the NMMA							
Identify and fundraise for training opportunities for Conservation Officers	Administration and Regulatory	Division Director	Governor, MOJ, Technical Partners	Money or opportunities secured	Records of funds raised	N/A	Included in recurring and capital assets
Develop training program (or adopt existing programs) and minimum requirements for Conservation Officers	Capacity Building	Division Director	Governor, MOJ, Technical Partners	Training program developed/List of minimum requirements generated	Document on training program	5000	Contract for Training Program/Meetings
Recruit and hire any additional staff as needed.	Administration and Regulatory	Division Director	Governor	Fully staffed Conservation and Law Enforcement Division.	Hiring documents	N/A	Included in recurring and capital assets
Purchase surveillance and enforcement materials and equipment	Enforcement and Surveillance	Division Director	Governor	Fully equipped Conservation and Law Enforcement Division.	Inventory sheets	N/A	Included in recurring and capital assets
Develop a Compliance and Enforcement Plan; to include penalties and fines	Enforcement and Surveillance	Division Director	Consultant	Clear, functional operational enforcement plan. Continuation of NMMA Standard Operating	Copy of plan	15000	Contract for Compliance and Enforcement Plan; Additional legal expertise

Objective/Activity	General Strategy	Lead	Supporting Individuals	Indicator of success	How measured	Year 1 cost	Year 1 cost description
				Procedures (SOP) development.			
Develop a day-to-day operations and activity schedule, Standard Operating Procedures (SOP), and reporting reporting formats (log books)	Enforcement and Surveillance	Division Director	Conservation Officers	Day-to-day plan developed and used.	Copy of plan	5000	Contract for materials; Additional legal expertise
Develop citation/paperwork system to support enforcement	Enforcement and Surveillance	Division Director	State Attorney	Paperwork system developed and used.	Copies of paperwork	5000	Contract for materials; Additional legal expertise
Based on the Compliance and Enforcement Plan and Day-to-Day operations plan, conduct regular surveillance and enforcement (e.g. check permits, intercept boats, issue citations, prosecute violators)	Enforcement and Surveillance	Conservation Officers	State Attorney	Fewer incidences of violations	Daily enforcement logs	N/A	Included in recurring and capital assets
Develop and implement record keeping and reporting system for violations.	Enforcement and Surveillance	Division Director	Conservation Officers	Regularly maintained Log Book of daily operations, Incidence Reports, Citation Records, and Detainment and Arrest Reports (when fully authorized).	Copies of log books	N/A	Included in recurring and capital assets
Mark boundaries of specific management areas or zones.	Maintenance and on-the-ground	Division Director	Conservation Officers	Boundaries marked / Increased awareness of zones / Conservation Officers have easier ability to enforce rules	Photos of buoys	N/A	Included in recurring and capital assets
Conservation Officers georeference boundaries with GPS and submit to State Administrative Personnel and State Attorney for formal records.	Maintenance and on-the-ground	Conservation Officers	State Admin Staff, State Attorney	Formal record of boundaries	Copies of GPS coordinates	N/A	Included in recurring and capital assets
Establish necessary partnerships (e.g. with Fish and Wildlife and Police)	Enforcement and Surveillance	Governor	Ministry of Justice	Written MOU on joint enforcement	Copy of MOU	N/A	Included in recurring and capital assets

Objective/Activity	General Strategy	Lead	Supporting Individuals	Indicator of success	How measured	Year 1 cost	Year 1 cost description
Evaluate success of compliance and enforcement strategies and activities quarterly.	Administration and Regulatory	Division Director		Quarterly surveillance and enforcement reports (evaluation reports) / increased understanding of enforcement success	Copies of reports	N/A	Included in recurring and capital assets
Objective 5: Promote awareness and understanding							
Identify and source a Consultant to assist with developing Outreach, Communications, and Education Plan	Administration and Regulatory	Governor	Division Director	Funds and consultant secured	Copy of contract	N/A	Included in recurring and capital assets
Develop an Outreach and Communication (OC) Plan (with expected, outcomes, goals, key messages, activities, etc.) that is in line with NMMA Visitor Plan and Program	Education, Awareness, and Outreach	Division Director	Consultant	Plan developed and adopted	Copy of plan	10000	Contract for Outreach and Communications Plan
Fundraise for and secure a designer/construction expert to articulate elements, requirements and overall design of an Interpretative Visitor Center.	Administration and Regulatory	Governor	Division Director	Funds and consultant secured	Copy of contract	N/A	Included in recurring and capital assets
Objective 6: Develop a monitoring and research program that addresses important management questions							
Convene the Advisory Council to assist the Ngarchelong MMA Program with monitoring and research needs.	Research and monitoring	Division Director	Technical Partners	M&R Working Group Members Identified / First meeting held	List of names, meeting minutes	N/A	Included in recurring and capital assets
Design a monitoring and evaluation program for the NMMA (biophysical, socioeconomic, outcome)	Research and monitoring	Division Director	Monitoring Working Group / Technical Partners	Monitoring protocols adopted / agreement to implement	Copy of monitoring plan	1000	Contract to review and implement monitoring program
Use existing data and information to establish baselines	Research and monitoring	Division Director	Monitoring Working Group / Technical Partners	Baseline conditions report/database generated	Copy of data / reports	2000	Contract for a researcher to assist with establishing baselines
Undertake monitoring activities and analysis to establish missing baselines and to track changes over time	Research and monitoring	Division Director	Conservation Officers / Technical Partners	Monitoring data / results gathered.	Copy of data / reports	N/A	Included in recurring and capital assets

Objective/Activity	General Strategy	Lead	Supporting Individuals	Indicator of success	How measured	Year 1 cost	Year 1 cost description
Conduct an Annual Monitoring Review Meeting	Research and monitoring	Division Director	Monitoring Working Group / Technical Partners	Assessment of monitoring results / recommendations for changes to plans	Meeting minutes	N/A	Included in recurring and capital assets
Develop and pass regulations to establish research permits and fees	Administration and Regulatory	Division Director	State Attorney	Permit system established	Copy of regulations, application	N/A	Included in recurring and capital assets
Objective 7: Implement components of a Business and Sustainability Plan							
Perform regular maintenance of equipment and vehicles as specified by manufacturer.	Administration and Regulatory	Division Director	Conservation Officers	Equipment maintained	Daily logs	N/A	Included in recurring and capital assets
Perform annual inventory and condition of Program equipment, vehicles and supplies.	Administration and Regulatory	Division Director	Conservation Officers	Inventory updated	Daily logs	N/A	Included in recurring and capital assets
Other General Activities, Not specifically Related to Objectives							
Recruit and Hire Division Director	Administration and Regulatory	Governor	State Assembly	Director hired	Copy of hiring paperwork	100	Newspaper advertisements
Actively fundraise - PAN, grants, etc.	Administration and Regulatory	Governor	Division Director	Funds raised	Financial records	N/A	Included in recurring and capital assets
Hold Quarterly meetings to review progress of Program, suggest modifications as necessary	Administration and Regulatory	Division Director	Governor, Conservation Officers	Quarterly meetings held	Meeting minutes	N/A	Included in recurring and capital assets
Prepare Annual Summary Reports and Conduct Annual Review	Administration and Regulatory	Division Director	Consultants/Technical Advisors	Written annual reports that meet all (PAN/State) requirements	Copy of reports	N/A	Included in recurring and capital assets
Hold Annual Meetings to review reports and progress of Program, suggest modifications as necessary	Administration and Regulatory	Division Director	All other stakeholders	Annual meeting held	Meeting minutes	N/A	Included in recurring and capital assets
Prepare Annual Work Plans and Budgets (including PAN request)	Administration and Regulatory	Division Director	All other stakeholders	Work plan and budget submitted to PAN	Copies of plan, budget, and cover letter to PAN	N/A	Included in recurring and capital assets
Create NMMA Division within State government	Administration and Regulatory	Governor	State Assembly	Division created formally	Copy of State organizational chart	N/A	Included in recurring and capital assets

Objective/Activity	General Strategy	Lead	Supporting Individuals	Indicator of success	How measured	Year 1 cost	Year 1 cost description
Hire staff (e.g. additional Conservation Officers)	Administration and Regulatory	Governor	Division Director	Staff hired	Hiring paperwork	100	Newspaper advertisements
Submit PAN Application for entire NMMA	Administration and Regulatory	Governor		NMMA becomes PAN site	Copy of letter from Ministry of NRET	N/A	Included in recurring and capital assets
Year 1 Costs (Specific to activities, not recurring or capital assets); not including administration of 17%						68700	

Appendix 3. Budget justification

Conservation and Law Enforcement Division Director (up to \$15,000-\$23,000/year) – The Division Director is responsible for all operational aspects of the Ngarchelong MMA Program, including but not limited to: oversight and management of personnel and program assets; enforcement activities; public awareness; reporting; planning; finance; and administration. Additionally, the Division Director will be the lead staff in coordinating Program communication and activities with various agencies, initiatives, organizations, advisors, and contractors upon the advice and guidance of the Governor and Conservation and Law Enforcement Division's Advisory Council. The Division Director is also responsible for reporting on the achievement and progress towards program objectives and on Program finances, with the Finance Officer, to the Advisory Council (and its Finance Working Group), the Governor, Assembly, and other agencies. The Division Director will be supported by a Chief Conservation Officer, a State Financial Officer, members of the C&LE Division Advisory Council, and a Program Advisor.

Chief Conservation Officer (\$15,000/year) – The Chief Conservation Officer (CCO) is responsible for all aspects of field activities and interaction with the public, including residents and visitors. Primary duties and responsibilities focus on promoting the awareness of state and national laws, rules, and regulations relevant to the MMA to the general public and visitors, as well as enforcing these laws and rules. As Chief Conservation Officer, the CCO is one of Ngarchelong State's lead deputized Law Enforcement Officers, and must be knowledgeable in how to properly record and process suspected violations, as well as report information from surveillance and other field activities to proper recipients. The CCO supervises and supports a team of Conservation Officers, Interns and Volunteers who undertake activities as described in the current version of the MMAs workplan. Ensuring for the care and maintenance of equipment (such as boats, engines, computers, radios, office equipment, and dive gear) is the responsibility of the Chief Conservation Officer. For maintenance and/or repair beyond the skills or ability of the Conservation Officers, the CCO will coordinate with the Division Director to arrange professional maintenance or repair for valuable capital, infrastructure, or equipment.

Conservation Officers (initially 4 staff x \$8,000/year, additional 2 staff added later) – Conservation Officers (COs) are to be trained and formally deputized to enforce both State and National laws within the MMA, and broadly throughout the State's jurisdiction. Conservation Officers are expected to interact with the public and visitors, and conduct routine daily management activities, as identified in the MMA's current workplan. It will be mandatory for COs to attend the National Palau Police Academy. To supplement this training, COs will receive additional training specific to marine law enforcement and surveillance, reporting, program monitoring, and interacting with the public and visitors. COs will contribute to community outreach and awareness activities, as well as participate in the preparation of quarterly and annual reports. Further detail of day-to-day responsibilities will be provided in subsequent versions of the plan and/or an operations manual (Standard Operating Procedures or SOPs) produced within the first 1-2 years of program development. It is expected that two (2) additional CO staff would be hired beginning in Year 4 (2015) to deepen the CO team and to bolster field and outreach activities once initial routines and roles have been established.

Conservation Interns (\$3,000/year) – Conservation Intern positions are suggested as an integral element of the program staffing and development. In addition to assisting with important office, field, and community activities, the establishment of an internship program can be an important mechanism to build local capacity, grow interest, and otherwise provide opportunities among younger members of the community to become active within the NMMA program. With certain restrictions, these conservation interns would support conservation officers in resource monitoring, general reporting, and outreach and awareness activities.

Peace Corps Volunteer or JOCV/JICA Volunteer (1 x \$2,400/year) – Volunteers are a cost-effective way to obtain assistance in specific areas such as education and outreach.

State Financial Officer (\$3,000/year) – The State Financial Officer supports the Division Director in accounting for and reporting on program finances to State, National, NGO and international entities and

donors as required. In planning for the management of the Ebiil Conservation Area, it was determined that Ngarchelong State's Financial Officer would allocate 20% of his time to providing financial management services to the management program. This proposed arrangement for a shared financial manager will remain during the expansion of the State's MMA program, until other solutions are deemed necessary. The Financial Officer will be responsible for financial management, record keeping, and transparent reporting on all sources and use of funds within the NMMA program, including state and national government funding through the Palau PAN and other sources (e.g. donor funds and earned income).

Paper Supplies – Paper supplies will be used for planning and educational activities.

Office Supplies – All consumable supplies required to keep the office operational. This includes pens, printer ink and toner, documentbinders, etc. These office supplies will be often accessed to supply program-related meetings as well.

Field supplies – This category includes consumable items for the field that are readily replaceable, such as (waterproof) field paper, pens and pencils, batteries, first aid supplies, rope, etc.

Staff Uniforms and Gear (\$1,000 per person) – Staff uniforms and gear are an important aspect of officer identity and program presence. On-duty Conservation Officers will be required to wear uniforms and badge that identifies their position and responsibility clearly to the public. Additional gear may include belts, utility knives, flashlights, etc. and any others necessary for the staff to safely carry out their duties.

Fuel – truck/van – The program currently uses a variety to vehicles borrowed by the State Government. These vehicles support program staff, partners, advisors and consultants in work related duty, such as transportation of field supplies and to and from program related events.

Fuel – boat – Two boats (a 28', single 225hp and a 24', single 150hp) are currently used to patrol and provide support to various activities in the area, including buoy maintenance, visitor management, and supporting resource monitoring. Estimates of fuel consumption over the period are based on existing activities, increasing gasoline prices and expanding responsibilities within the MMA over time. Current figures are rough estimates and should be adjusted based on actual costs, typical usage, and planned scope and range of boat activities. A log of boat use and fuel consumption should be maintained by COs to provide information for assessing program performance and budgeting purposes.

Vehicle maintenance – Maintenance to keep vehicles operating.

International Travel for Training Workshops, Exchanges, & Conferences – The program intends to allocate funds for intermittent international travel for staff to participate in training workshops, conferences and site exchanges that have the greatest potential to build staff capacity most relevant to the needs of the Program. Cost estimates are based on one (1) individual traveling internationally for approximately 7 days.

Meetings – Meetings are important means of communication for the staff, Advisory Council, local residents, and other stakeholders for reviewing progress, communication of issues between staff and stakeholders, identifying future opportunities and suggesting any changes or modifications to existing management activities. Community meetings will be held in every village multiple times per year. Food is expected at most meetings in Palau and boosts attendance.

State Attorney – Attorney services will be necessary to establish the legal framework of the NMMA in the first year and to assess and implement legal structures in each following year. The Attorney will need to review all legislation, help draft new legislation and regulations, and create permit and enforcement systems.

Annual Reports, Workplans, and Budgets – The state will contract PCS to assist with interpreting the Management Plan and writing reports, workplans, and budgets that meet PAN requirements.

Annual Monitoring and Evaluation – The state will contribute to the costs of monitoring, which will be implemented by PICRC and other technical partners.

Program Office / Outreach Center – The Ngarchelong MMA Program will benefit from an office, storage, and dock facilities located adjacent to the water at the Ollei Port. A Tourism and Resource Management Center has been proposed at the port grounds to accommodate the needs of Program staff, while providing an interesting and awareness building experience for residents and visitors alike. This Center would become the primary base of operations for the Conservation Officers and allow easy access to boats, equipment, and the ocean. Furthermore, it is expected that the Ollei Dock could be a gathering location for many of the State's visiting tourists as they apply for permits or otherwise check in for permitted activities. While at the Center, visitors can learn about Ngarchelong State's waters through interpretive displays and information on the highlights and rules and regulations of the MMA. Other guest facilities such as a gift shop, restaurant/café, showers, and facilities for visiting researchers have also been proposed. Once approved and funds are secured for the renovation of the port facility, it is envisioned that an architect/design firm would be hired to complete the design of the concept, followed by a construction phase. Cost of design and construction of the Center is estimated at up to \$250,000.

Floating Platform for Ebiil Channel – A floating platform near Ebiil Channel will serve as a platform for surveillance and overseeing visitor activities, thus minimizing non-compliance and visitor impacts. Such a platform could be constructed at a reasonable price using durable plastic floats and local materials and designed to accommodate numerous staff comfortably over extended periods of time.

Boat Upgrades – Two program boats are already in operation to support field activities. Given the conditions in which and duties that the Conservation Officers perform, all boats need to be outfitted with up-to-date safety, communications, and operating equipment, including double outboard engines, to provide for additional safety. Includes associated training and maintenance of equipment.

Boat Engine Replacement (\$30,000, Year 6) – Existing boats will require engine replacement due to increased use, sometime within 5 years.

Truck/Van Replacement – The program is currently using a Nissan 4x4 pickup truck purchased in 2009 for routine transportation duties. Due to increased use it will need to be replaced, or an additional vehicle will be needed as the NMMA Program expands.

Field Equipment – Includes equipment for field use like GPS units, cameras, binoculars, radios, SCUBA gear, safety equipment, etc.

Mooring/demarcation Buoys – Mooring and demarcation buoys will be required for the effective management and enforcement of MMA rules. Numerous drills and experienced teams exist in Palau to assist with the installation and maintenance of mooring or buoy pins. The size and number of zones means that many buoys will be necessary over a long period.

Desktop Computer – To assist with computer-based activities (planning, reports, educational materials). This computer will serve as a storage computer for all files.

Laptop Computer – To be used during meetings, field work, and as a regular work computer.

Projector – The current projector will need to be replaced. The projector is used during meetings.

Printer – To support all activities.

PA Speaker System – A public announcement (PA) speaker system is occasionally used at public meetings and other Program functions.

Administration – Includes occupancy, utilities, communications, insurance, bank fees, audits, miscellaneous operational expenses, and costs of supervision.

Compliance and Enforcement Planning – The development of a detailed Compliance and Enforcement (CE) Plan has been included in the plan to address a priority management objective. The CE Plan and accompanying Standard Operating Procedures (SOPs) for the Program's Conservation Officers will be their guide in their day-to-day law enforcement and surveillance activities. This plan and SOPs will articulate specific strategies, activities, protocols, infrastructure, safety, training, and equipment operation and maintenance relevant to on-the-ground operational needs of program staff. Technical expertise is required for specific legal or technical aspects.

Development of Outreach and Communication Plan and Materials – An Outreach and Communication (OC) Plan will be an important part of the achievement of the program's awareness and compliance objectives. The plan needs to involve a thoughtful process whereby simple and practical strategies are identified to promote the effective communication of program-related information and messages to a variety of audiences and site-users. The production of outreach materials and media products from time to time can be assisted by local specialists, in collaboration with local staff. The proposed Tourism and Resource Management Center at the Ollei dock facility can serve as a multi-purpose awareness and administration center for the management of the MMA. It is proposed that a series of interpretive displays at the Center will be created to provide important and interesting information regarding the Ngarchelong MMA to residents and guests alike, and can be incorporated into the OC Plan as appropriate.

Conservation Officer Training Programs – To be effective in marine law enforcement, Conservation Officers will require specialized training beyond basic police law enforcement skills they learn in the Palau National Police Academy. These skills include topics related to natural resource laws and conservation, coral reef and terrestrial ecology, marine law enforcement, as well as public outreach and education. A series of specialized courses in conservation law enforcement covering these topics, such as those currently being developed by the Guam Community College, will be needed. Developed in conjunction with various law enforcement and conservation partners in the Micronesia region, these courses, collectively labeled as a "Conservation Academy", can provide additional skills and training to existing or future conservation officers so that they can perform their duties safely and effectively.

Staff Monitoring Activities and Field Research Assistance – Monitoring achievement of management objectives is an important element of this management plan. Progress towards stated objectives and overall management effectiveness is important for the adaptive management of the site, and can be measured through several approaches. In order to meet the needs of managing the site in the interests of the local resource owners and to satisfy donor requirements, a Monitoring Plan will be drafted that identifies specific indicators and methods for measuring progress towards management objectives. Designed to meet the monitoring requirements of the Palau PAN, the Monitoring Plan will also identify who will be responsible for collecting the types of information sought. An important aspect of the monitoring plan is that it will focus on selecting which type of monitoring and methods are most appropriate for program staff to undertake or be involved with, given available time, funding, and proficiency – and sourcing out to others those activities that require a high degree of technical skills and expertise. It is intended that State-level monitoring be practical and not costly or technically demanding. Current staff are participating in training from the JICA-PICRC monitoring capacity building project, which can expand monitoring options for staff. Program staff, as available, can also assist other monitoring or research teams in their fieldwork and activities.

Visitor Plan and Program – To address the potential and development of ocean-based tourism within Ngarchelong State and its MMA, this plan includes expenses for contracting a professional tourism planner or Advisory Council. It is expected that the planner would work with program staff, state leadership, community members, advisors and other stakeholders to complete and initiate the implementation of a comprehensive tourism development plan for the State. Now that the Compact Road is complete and additional tourism infrastructure is either in place or being planned, it is critical time to consider various opportunities, alternatives, and specific policies for tourism development in the state.

Numerous studies have been conducted in the past related to the prospect of sustainable and culturally appropriate ocean- and land-based tourism development in Ngarchelong. This work will build on these previous studies to identify practical options, conduct market research, and to guide and promote tourism development activities within the State. Additional components of a 4 year overall workplan is expected to include marketing and training as necessary to support and implement aspects of the plan.

Appendix 4. Roles and day-to-day responsibilities of authorities and personnel

<p>Traditional Leadership</p>
<p>Traditional Leaders Role: Ngarchelong’s traditional leaders have a role in maintaining traditional and cultural practices, overseeing the use and control of natural resources according to traditional protocols, and counseling the State Government on the management of the area and ensuring the continuance of resource ownership and oversight according to traditional practices. Responsibilities:</p> <ul style="list-style-type: none"> • Approve revisions to the Management Plan • Assist with conflict management • Name and approve their representative to the Advisory Council • Maintain traditional way of keeping cultural practices and values (e.g. related to conservation and protecting the environment) • Provide input to management practices and activities • Enforce traditional rules (such as the <i>bul</i>) • Advise State Governor regarding marine resource and tourism management activities
<p>State Government Leadership</p>
<p>Governor Role: To oversee the management of the area by the State Government to ensure proper implementation of management efforts according to the plan. Responsibilities:</p> <ul style="list-style-type: none"> • Oversee the Conservation and Enforcement Division, in general • Name and approve a representative to the Advisory Council • Design and Implement Permit System • Collect tourism and other fees for income generation to cover site management expenses • Hire and oversee the Division Director (or Manager) • File incident reports with relevant agencies within the Palau National Government • Communicate with National Government on general issues (finances, program or agency correspondence, etc) • 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. • Dispense and report on the use of funds according to approved budgets • Approve and sign applications/permits (which can be delegated at a later time to the Division Director) • Negotiate agreements with potential partners • Introduce or initiate legislation, regulations, and resolutions, if necessary • Approve all reports and plans • Participate in community outreach and relevant meetings
<p>State Assembly Role: To set policy; review management activities and allocate resources as appropriate. Responsibilities:</p> <ul style="list-style-type: none"> • Review and approve Conservation and Enforcement Division work plans, reports, and budgets • Introduce and pass needed legislation and regulations • Provide advice and recommendations for the improvement of the program • Name and approve a representative to the Advisory Council • Conduct regular oversight of the Ngarchelong Marine Management Area program and activities.
<p>State Government Staff</p>
<p>State Attorney Role: Ensure consistency with laws and oversee development of regulations, legislation, and permits Responsibilities:</p> <ul style="list-style-type: none"> • Draft legislation and regulations • Review existing and new legislation for conflicts

<ul style="list-style-type: none"> • Draft permits, enforcement paperwork, etc.
<p>Conservation and Law Enforcement Division</p> <p>Division Director 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:</p> <ul style="list-style-type: none"> • Responsible for overall management of the site and the Conservation and Enforcement Division • 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 the Ngarchelong MMA • 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 and Law Enforcement 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 Conservation Division -level improvements to the Governor. • Recommend possible partnership with other agencies, institutions, organizations, networks, or individuals.
<p>Conservation Officers Role: Perform and report daily management tasks within the area to ensure proper implementation of management efforts according to the plan. Responsibilities:</p> <ul style="list-style-type: none"> • 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 Division Director 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.)
<p>State Administrative Staff / Financial Officer Role: Oversee the management of finances and maintain accurate financial records according to plan procedures. Responsibilities:</p> <ul style="list-style-type: none"> • Maintain financial records of expenditures of the Conservation and Law Enforcement Division • Review and approve purchase orders and other expenditures • Assist with procurement of equipment and supplies • Assist with logistics for events
<p>State Maintenance Staff Role: Assist with field activities. Responsibilities:</p> <ul style="list-style-type: none"> • Assist with field activities • Assist with maintaining equipment
<p>Supporting Partners</p>

<p>Ngarchelong Community Role: Support management Responsibilities:</p> <ul style="list-style-type: none"> • Comply with restrictions and prohibitions • Actively encourage others to comply with the Management Plan • Participate in community activities • Capitalize in tourism opportunities
<p>Palau International Coral Reef Center Role: Ensure monitoring and evaluation plan is implemented Responsibilities:</p> <ul style="list-style-type: none"> • Undertake and execute overall management activities • Name and approve a representative to the Advisory Council • Implement monitoring and assist Division Staff to learn monitoring and evaluation methods
<p>Technical Partners Role: Support management Responsibilities:</p> <ul style="list-style-type: none"> • Assist with capacity building and implementation

<p>Indicative Day-to-Day Responsibilities and Activities of Ngarchelong State Conservation Officers</p>
<ol style="list-style-type: none"> 1. Meet with supervisors to discuss priorities and upcoming events; communicate any needs to supervisors. 2. Prepare weekly schedule and any necessary authorizations. 3. Conduct regular, randomized surveillance within the NMMA – including land and water based observation, day and night. 4. Assist with checking and processing of site visitation permits. 5. Supervise visitors as necessary; ensure for visitor safety and compliance within the NMMA. 6. Undertake NMMA awareness and educational activities for visitors and residents. 7. Inform suspected violators of NMMA, State and National laws and rules, until authority to issue citations and carry out other law enforcement activities is granted. 8. Conduct record keeping and assist with NMMA program monitoring activities as necessary. 9. Maintain a log of daily activity, including hours worked, vehicle use, equipment needs, and any assignments or actions. 10. Prepare Incident Reports (IRs) to recordsignificant events (e.g., suspected violations, emergency response, etc.); submit reports to Governor, retain copies for C&LE Office. 11. Check and maintain all equipment on a regular basis; maintain an inventory and service list. 12. Transport equipment and supplies between Ngarchelong and Koror. 13. Assist with the creation of monthly, quarterly, and annual reports. 14. Help with the presentation of quarterly and annual reports. 15. Plan for and attend relevant NMMA management-related trainings. 16. Continue to work on development of physical fitness and personal skills and knowledge, based on management related materials (e.g., laws, rules, regulations, etc.), pervious trainings (e.g., officer survival skills) or other work-related knowledge (e.g., how to operate and maintain new equipment).

Appendix 5. Guidance for additional plans

Compliance and Enforcement Plan

A more detailed Surveillance and Enforcement Plan will be developed as part of the upcoming planning activities for enhancing surveillance and enforcement within the entire NMMA by mid-2011. The development of the Surveillance and Enforcement Plan shall include approaches for dealing with specific enforcement issues, such as enforcement procedures, evidence handling and chain of custody, and training needs.

Awareness, education and visitor program

A Visitor Program and Awareness Plan will be developed as part of the Visitor Education and Awareness Program under the associated objective. As part of its development of the Visitor Program the following will be further defined: equipment required; proper conduct of visitors within the conservation area; the proper awareness and notification of harmful species and other risks which may pose harm to visitors; the number of escorts to number of visitors or students; the number of permits issued for the allowable activities. Additional education and awareness activities will be planned and implemented.

Monitoring plan

A monitoring plan has been suggested in this Management Plan to assist the State and partners in evaluating the effectiveness of management activities. Such a plan should permit the State and supporting partners to successfully track the progress of stated management objectives over time, and compare expectations with actual achievements. It should be noted that in this plan, the State Government and staff would be expected to carry out some --but not all -- of proposed monitoring activities and protocols. The State Governor, Assembly and Conservation Division should be involved in 1) determining what monitoring activities can be addressed by the conservation Division and/or with the assistance of community members and 2) identifying and making arrangements with partner organizations that can assist with specific aspects of monitoring.

A draft monitoring plan with associated indicators, protocols (methods), and parties responsible is included in **Appendix 9**. This draft plan is scheduled to be further elaborated and confirmed in coming months. The plan is intended to provide a framework in conforming to several common monitoring protocols that are currently applied by communities, support partners, researchers and initiatives in the region – and will allow Ngarchelong State to easily contribute information regarding the area’s management to national and regional initiatives as desired. Training for project monitoring is identified as an activity.

Appendix 6. Management Targets (Species) -- Reef fish and invertebrates of importance and value to the Ngarchelong community; candidates for long-term monitoring.

Palauan Name	Common Name	Scientific Name
FISH		
Tiau (black)	squaretailed coral grouper	<i>(Plectropomusareolatus)</i>
Tiau/Mokas (red)	leopard coral grouper	<i>(Plectropomusleopardus)</i>
Temekai/Meteungeral'temekai	tiger grouper = marbled grouper	<i>(Epinephelusfuscoguttatus)</i>
Kesau/Ksau'temekai	camouflage grouper	<i>(Epinepheluspolyphekadion)</i>
Katuu'tiau/Mokas	saddled grouper	<i>(Plectropomuslaevis)</i>
Kemedukl/Berdebed	bumphead parrotfish	<i>(Bolbometoponmuricatum)</i>
Maml/Ngimer	humphead wrasse	<i>(Cheilinusundulatus)</i>
Chum	Bluespineunicornfish	<i>(Nasoumicornis)</i>
Meyas/Meas, Kelsebuul, (Terekrik)	Rabbitfish	Meas is <i>(Selarfuscuscens)</i> Kelsebuul is <i>(Selarlineatus)</i> , Terekrik is <i>(Selarcrumenophthalmus)</i> -- this is caught at night with line usually near docks where there are light. I am not sure this is a good indicator fish and will be very hard to monitor.
Melangmud	Long-nosed emperor	<i>(Lethrinusolivaceus)</i>
Kedesau	red snapper	<i>(Lutjanusbohar)</i>
Keremlal	Snapper	<i>(Lutjanusgibbus)</i>
Erangel	Orangespine Unicornfish	
Kelat	fringelip mullet	<i>(Moolgardasebeli)</i>
Uluu	yellowtail mullet	<i>(Liza vaigiensis)</i>
Mesekelat	Milkfish	<i>(Chanoschanos)</i>
Aol	Indo-Pacific bonefish	Chanoschanos (juvenile of mesekelat)
Mesekuuk	Name	<i>(Acanthurusxanthopterus)</i> -- popular fish up north, caught by spear fishing
Ngiaoch	Name	<i>(Hipposcaruslongiceps)</i>
Invertebrates		
Otkang, Ribkungel, Kism, Melibes, Oruer, Duadeb, Duadeb	Giant clams	<i>(Tridacnagigas)</i> <i>(Tridacnasquamosa)</i> <i>(Tridacnaderasa)</i> <i>(Tridacna maxima)</i> <i>(Tridacnacrocea)</i> <i>(Hippopushippopus)</i> <i>(Hippopusporcellanus)</i>
Bakelungal-chedelkelek, Bakelungal-cherou, Molech, Badelchelid, Eremrum, Temetamel Sekesaker Ngims	Sea cucumbers	<i>(Holothurianobilis)</i> <i>(Holothuriafuscogilva)</i> <i>(Holothuriascabra)</i> <i>(Actinopygamauritiana)</i> <i>(Actinopygamiliaris)</i> <i>(Tbelenotaanas)</i> <i>(Halothuria impatiens)</i> <i>(Stichopus spp.)</i>
Semum	Trochus	<i>(Trochus niloticus)</i>
Bleiached, Raiklius, Meleck	Rock Lobsters	<i>(Panulirusversicolor)</i> <i>(Panuliruspenicillatus)</i> <i>(Panuliruslongipesfemoristriga)</i>
Emang	Magrove Crab	<i>(Scylla serrata)</i>

Appendix 7. Additional recommendations for activities in the state that will align with the NMMA

Fishing and Aquaculture

- Continue and expand commercial fishing as part of the state self-sufficiency and economic development. In cooperating with other states, ensure that fishing activities do not exceed the sustainable yield of the resource.
- If agriculture shifts increasingly from subsistence to commercial, rigid adherence to mangrove and stream course setbacks should be maintained in order to avoid potential contamination of sensitive mangrove communities and Ngarchelong's few sources of drinking water. Mangrove setbacks are particularly important if agriculture expands into the area by Tabrkeam which the maps show is a highly suitable agricultural area; this area is bounded by mangroves.

Recommendations related to the State Master Plan

- Identifying and planning for tourism development at locations and intensities supported by the citizens of the state.
- Pursuing expansion of the fishing and fish processing activities while ensuring adequate environmental safeguards.
- Improving on the number and location of community facilities, including cultural centers, marinas and parks.
- Planning for, and implementing, infrastructure systems to adequately serve all development proposals.
- Prioritizing the preservation of agriculture potential as much as possible when this potential overlaps that for community, tourism, or other developed land uses.
- Ensuring that agricultural inputs (pesticides and fertilizers) are applied using 'best management practices' and that stream buffers are maintained for commercial-level farming operations.
- Minimizing development in steep areas and within water supply watersheds.
- Implementing measures to prevent the introduction or spread of alien invasive species.
- Caution in proposing or considering development in remote areas, where infrastructure costs would be high and unnecessary fragmentation of natural vegetation/habitat would result.
- Considering designating additional mangrove areas for protection status.
- Developing better data on marine resource yields and utilizing these data in the form of fishing moratoriums, catch limits, etc. to ensure against over harvesting in the near and off-shore areas as the result of subsistence, commercial and/or sport fishing.
- Incorporate and broaden the Ebil Channel Conservation Area management plan into a state-wide resource management plan that compliments a pending State Master Plan.
- Evaluating cultural resources within the state and nominating additional sites to the National Register in order to ensure their preservation.

Appendix 8. Evaluation criteria

Goal/Objective	Milestones	Indicator(s) of Success	How measured
<p><i>Goal 1. Use traditional knowledge and modern science to improve and sufficiently maintain the marine resources and habitats of Palau’s Northern Lagoon to satisfy the subsistence food fish needs of the people of Ngarchelong, support a limited, small scale commercial fishery and non-extractive tourism activities, and become a model for sharing information on successful management</i></p>	<p><i>NMMA Division Created and staff hired by Year 1</i></p> <p><i>PAN Site status for entire NMMA by Year 1</i></p>	<ol style="list-style-type: none"> 1. <i>Traditional leaders involved in management</i> 2. <i>Increasing or stable fish and invertebrate numbers</i> 3. <i>Decreasing or no reports of declining resources</i> 4. <i>Declining or no reports of takings of protected or endangered species</i> 5. <i>Survey respondents indicate adequate resources for subsistence uses</i> 6. <i>Resources adequate to meet commercial fishing needs of Ngarchelong residents (based on survey responses)</i> 7. <i>Tourism income grows yearly</i> 8. <i>Lessons learned from the NMMA documented and shared</i> 	<ul style="list-style-type: none"> • <i>Biological surveys</i> • <i>Socioeconomic surveys</i> • <i>Records and notes from meetings, proceedings, and events</i> • <i>Copies of products and documents</i> • <i>Surveillance and enforcement logs and records</i> • <i>Financial records</i>
<p>Objective 1: Manage fisheries activities, particularly by using the wisdom of traditional leaders, within the Ngarchelong MMA to maintain culturally and economically important fish and invertebrate populations at current or increasing levels by 2014.</p>	<p>Baseline data collected, Year 1</p>	<ol style="list-style-type: none"> 1. Fish and invertebrate parameters are increasing or stable compared to a baseline 2. Survey respondents report that NMMA fisheries meet their cultural and economic needs 3. Traditional leaders consulted as part of planning and implementation 	<ul style="list-style-type: none"> • PICRC PAN Monitoring Protocol • Socioeconomic survey • Records and notes from meetings/discussions with traditional leaders
<p>Objective 2: Maintain the health and quality of important or sensitive habitats and sites (e.g., exceptionally diverse or productive marine habitats) in Ngarchelong State waters by protecting sensitive areas, restoring viable habitats, and reducing and/or controlling threats to these areas.</p>	<p>Zones adopted by Year 1</p>	<ol style="list-style-type: none"> 1. Zones adopted and understood by NMMA users 2. Coral parameters show healthy coral communities 3. No records or survey responses of taking or harm to endangered or protected species 4. Enforcement actions in protected areas decline or are zero 	<ul style="list-style-type: none"> • Signed documents showing adoption of zones • PICRC PAN Monitoring Protocol • Socioeconomic survey • Enforcement personnel

		5. Reports of unauthorized entry to and use of protected areas decline or are zero	records
Objective 3: Complete a comprehensive Tourism Planning and Development process for the State of Ngarchelong by the end of 2014 that results in tangible policy outcomes formally adopted by the State, promotes mutually-beneficial, culturally-appropriate, and environmentally-sound tourism, and increases the number of tourists visiting the NMMA towards a sustainable capacity level.	<p>Visitor Plan completed by Year 2</p> <p>Determination of sustainable capacity level by Year 2</p> <p>Tourism education and permits in place by Year 3</p>	<ol style="list-style-type: none"> 1. NMMA Visitor Plan and Program drafted, adopted, and implemented 2. Policies required by the Visitor Plan are adopted/passed by leaders 3. NMMA is promoted to an increasing number of audiences yearly 4. Number of tourists to the NMMA increase annually 	<ul style="list-style-type: none"> • Copy of Visitor Plan available • Copies of signed policies or legislative actions adopting policies • Records of tourism promotion activities (e.g. addressees, number of web hits, etc.) • Records of visitors (e.g. counts, number of permits)
Objective 4: Develop an effective surveillance and enforcement program that reduces illegal activities within the NMMA to negligible levels by the end of 2013.	<p>Rules drafted by Year 1</p> <p>Rules adopted and enforceable by Year 2</p> <p>All equipment and structures needed to support daily surveillance and enforcement in place by start of Year 3</p>	<ol style="list-style-type: none"> 1. Number of enforcement actions declines to zero 2. Survey respondents report no illegal activities 	<ul style="list-style-type: none"> • Records of enforcement actions, daily logs • Socioeconomic survey
Objective 5: Promote awareness and understanding among the community, managers, and other stakeholders of 1) NMMA rules and provisions, 2) the status, importance, and changes of marine resources at the site, 3) the impact of human activities and management actions, and 4) lessons learned from management.	<p>Outreach Plan completed by Year 2</p>	<ol style="list-style-type: none"> 1. Survey respondents indicate a growing awareness and understanding of rules 2. Lessons documented and distributed to wide audiences 	<ul style="list-style-type: none"> • Socioeconomic surveys • Records and copies of documents and education materials • Records of people receiving information on NMMA

<p>Objective 6: Develop a monitoring and research program and use data generated by the program to address important management questions posed by the community, NMMA managers, and supporting partners.</p>	<p>Monitoring program developed and implemented by 2013, including establishment and collection of all baseline information</p>	<ol style="list-style-type: none"> 1. Monitoring Plan completed 2. Monitoring and research are implemented regularly (according to the Plan) 3. Monitoring data is used by the Advisory Council, Division Director, and/or other stakeholders during annual reviews of the Management Plan 	<ul style="list-style-type: none"> • Copies of monitoring data • Monitoring and research reports • Records from annual review process
<p>Objective 7: Implement components of a Business and Sustainability Plan for the NMMA by 2014 to develop 1) operational sufficiency and efficiency, 2) accountability, and 3) sustainable finance sources (including funding through the Palau PAN and revenue generation through the promotion of dive and sportsfishing tourism), so that the NMMA's reoccurring operating costs are met yearly.</p>	<p>Plan developed by 2014</p> <p>Reliance on PAN funding decreases by at least 5% each year</p>	<ol style="list-style-type: none"> 1. Business and Sustainability Plan completed, adopted, and implemented 2. Income from tourists increases annually 3. NMMA income comes from diversified sources 4. Records of commercial use indicate little to no negative impact 	<ul style="list-style-type: none"> • Copy of plan • State financial records • Biophysical and socioeconomic monitoring data

Appendix 9. Monitoring Plan

Target	Indicator	Lead Party	Methodology	Frequency
Objective 1: “Maintain culturally and economically important fish and invertebrate populations...”				
Reef Fish	Population abundance/density, size/biomass, population structure	PICRC	PAN Protocol	Quarterly
Fish Aggregations	Population abundance/density, size/biomass, population structure	PICRC	PAN Protocol	Seasonally
Trochus	Population abundance/density, size, population structure	PICRC/MRD	PAN Protocol	Annually
Clams, Sea Cucumbers	Population abundance/density, size, population structure	PICRC	PAN Protocol	Annually
Mangrove Crab	Population abundance/density, size, population structure	PICRC	To be determined	Annually
Mangrove Clam	Population abundance/density	PICRC	To be determined	Annually
Economic welfare	% population stating fisheries meet needs	PICRC	Socioeconomic survey	Baseline and Year 5
Cultural resources	Number of traditional leaders participating in fisheries management	Division Director	Tracking of meetings, records	Annually
Objective 2: “Maintain the health and quality of important or sensitive habitats and sites...”				
Coral	% benthic cover, community structure , recruitment	PICRC	PAN Protocol	Annually
Seagrass	% cover	PICRC	PAN Protocol	Annually
Mangrove forest	To be determined	PICRC	To be determined	Annually
Dugong	Population abundance	Conservation Officers/Community	To be determined, incidental sightings	Annually
Turtle	Population abundance	PICRC/Dive Guides	To be determined, combination of PAN Protocol and incidental sightings	Annually
Protected Species	% people reporting knowledge of illegal takings or illegal entry	PICRC	Socioeconomic survey	Baseline and Year 5
Protected Species	Number of enforcement actions related to illegal takings	Division Director	Daily enforcement logs, records from Fish & Wildlife	Annually
Biodiversity/ Sensitive habitats	Number of reports of unauthorized entry to sites	Division Director	Daily enforcement logs	Annually
Objective 3: “Mutually-beneficial, culturally-appropriate, and environmentally-sound tourism...”				
Dive sites	Number of tourists at each dive site; damage to dive sites	Division Director; Conservation Officers, tour guides	Records of tourist boat numbers, incidental sightings	Annually

Target	Indicator	Lead Party	Methodology	Frequency
Economic welfare	Number of policies passed relative to number of policies proposed in Tourism Plan	Division Director	Records and copies of documents	Annually
Economic welfare	Number and types of media and audiences targeted for promotion of the NMMA	Division Director	Records of promotional activities	Annually
Economic welfare	Number of tourists	Division Director	Copies of permits	Annually
Management Objective 4: "Reduce illegal activities within the MMA to negligible levels..."				
All targets	Number of enforcement actions	Division Director and Conservation Officers	Daily enforcement logs and records	Annually
All targets	% of people reporting knowledge of violations	PICRC	Socioeconomic survey	Baseline and Year 5
Management Objective 5: "Promote the awareness and understanding..."				
All targets	% of people reporting positively to questions about NMMA	PICRC	Socioeconomic survey	Baseline and Year 5
All targets	Number of documents produced tracking lessons learned and Number of audiences receiving lessons learned	Division Director	Distribution lists	Annually
Management Objective 6: "Address important management questions..."				
All targets	% of monitoring plan implemented	Division Director	Records of work performed compared to plan	Annually
All targets	Number and types of data used during annual reviews	Division Director	Meeting minutes	Annually
Management Objective 7: "Implement components of a sustainable financing program..."				
Economic welfare	% of project budget from sustainable sources (income total; income sources)	Division Director	Financial records	Annually