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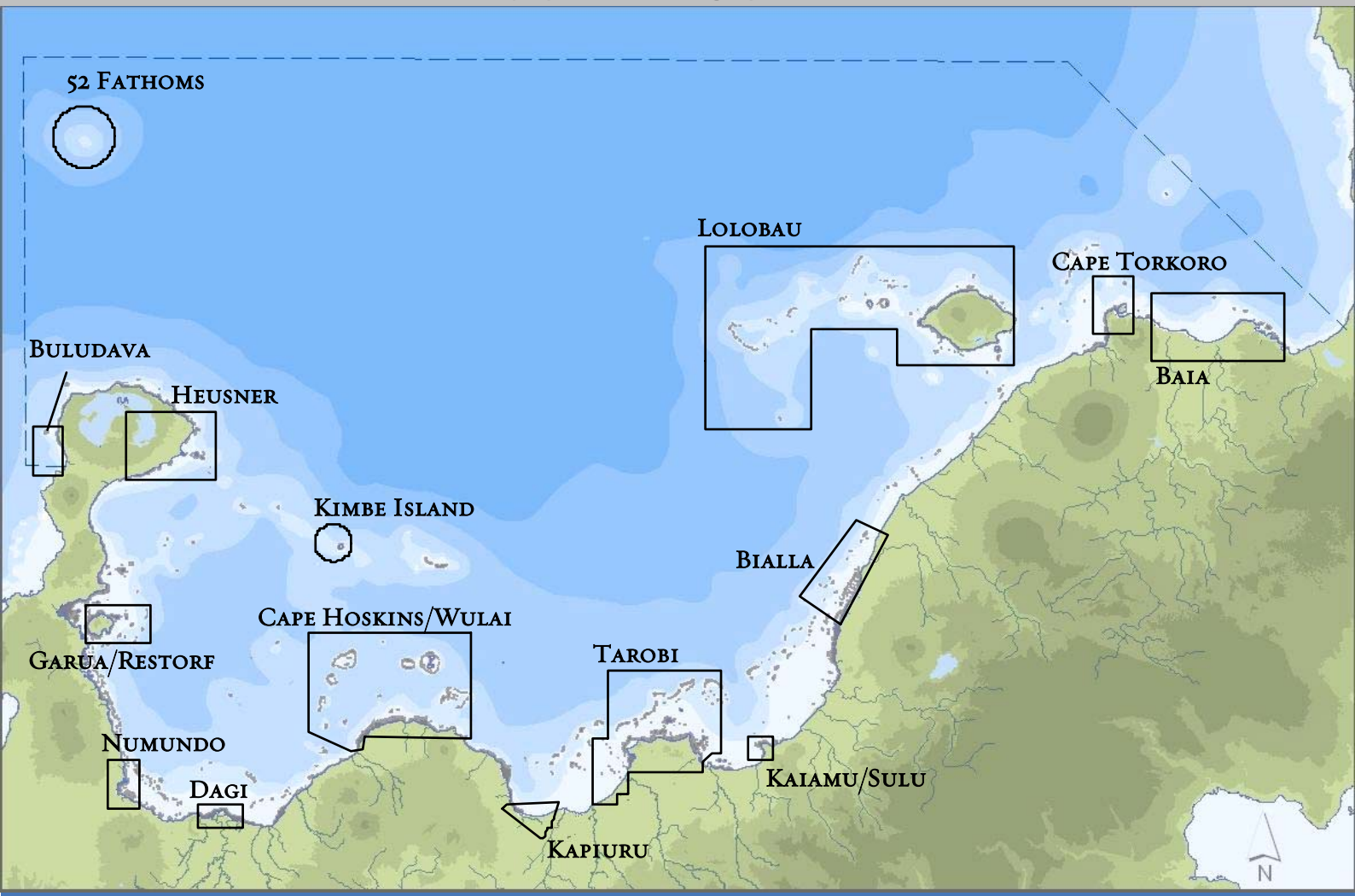
Scientific Design of a Resilient Network of Marine Protected Areas

Executive Summary



Kimbe Bay, West New Britain, Papua New Guinea

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FOREWORD

Situated on the volcanic island of New Britain, West New Britain province is rich in biodiversity both on the land and under the sea. Our people pride themselves in a land tenure system which has been passed down from generation to generation, a clan ownership of land resources, which are shared out equally between clan communities. Originating from a subsistence economy where harvests from the land and catches from the sea were shared to ensure everyone had enough to live on and no one had less than another, we are now challenged by the cash economy in which we live today.

The need for better education, health and other services continue to increase and our people have to adapt to meet these situations with the various measures that they take. Earning an income has become a necessary means to meet their children's school fees and to get better medical services. Better health services have seen a rapid population growth which results in pressures on the environment as people lean towards cash cropping or marine resources for an income. Better education means knowledge and power that challenges the traditional leadership, which leads to a lack of respect and breakdown in traditional values and authority.

However, these challenges make us more persistent to make the best out of our situation and with organisations such as The Nature Conservancy, which ensures partnership is a major component of their work, we are truly privileged to witness the work they have done in the last 15 years.

The vision for the Kimbe Bay MPA network, which I fully endorse is "*Harnessing traditional and community values to protect and use land and sea resources in ways that maintain the exceptional natural and cultural heritage of Kimbe Bay."* This vision recognises and connects the people of my province with the natural resources and biodiversity of the province that has helped sustain our culture and livelihood for thousands of years.

Since 1992, The Nature Conservancy has been working in Kimbe Bay conducting various surveys and studies to find out the condition of the marine environment, and whether or not the area is ideal for a Marine Protected Area (MPA), and to date have identified 15 Areas of interest that make up an MPA design.

This publication, which outlines the design and implementation of the Kimbe Bay Marine Protected Area Network, aims to provide stakeholders with an in-depth report of the work carried out by The Nature Conservancy to date.

As the Governor of the West New Britain province I pledge my support to work with all stakeholders for the good of the province. I would like to encourage all stakeholders and partners to support the work of Non Government Organizations and especially The Nature Conservancy. At the end of the day conservation has been part and parcel of our life and it is fitting that we should continue to support it.

We congratulate The Nature Conservancy for their outstanding work and pledge our continued support.

Honorable Clement Nakmai
Governor – West New Britain Province

Acknowledgements

The Conservancy wishes to thank local communities for sharing their knowledge of Kimbe Bay, and the communities, Local Level, Provincial and National Governments for supporting the MPA network and the scientific design.

Many people have contributed to this project. The MPA network design was completed by The Nature Conservancy's core design team for Kimbe Bay. This team was responsible for assembling the scientific data, conducting the data analysis, and generating the design.

The Conservancy is grateful for scientific advice provided by technical experts regarding MPA network design (Rod Salm and Peter Mous, The Nature Conservancy), conservation planning and coral reef fish communities (Maria Beger, University of Queensland), ocean currents (Craig Steinberg, Australian Institute of Marine Science), biological patterns of connectivity (Glenn Almany, James Cook University), reef geomorphology (Serge Andrefouet, Institute for Marine Remote Sensing, IMaRS), dive tourism (Max Benjamin), and socioeconomic characteristics of the bay (Gina Koczberski and George Curry). We are also grateful to the technical experts who helped refine the guiding principles for the MPA network design in the First Scientific Workshop.

This work would not have been possible without the generous support of USAID, the David and Lucile Packard Foundation, an anonymous donor, Wayne and Colleen Minami, RARE, the LMMA network, The Nature Conservancy's Global Marine Initiative and our ongoing partnership with Mahonia Na Dari and Walindi Plantation Resort.

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EXECUTIVE SUMMARY

The Nature Conservancy's vision for Kimbe Bay is to *"Harness traditional and community values to protect and use land and sea resources in ways that maintain the exceptional natural and cultural heritage of the bay"*. This will be achieved by working with local communities, governments and other stakeholders to establish a resilient network of Marine Protected Areas (MPAs), and develop strategies for improved management of marine resources and land use practices. This report focuses on a critical step in this process – designing a resilient network of MPAs for Kimbe Bay.

SCIENTIFIC DESIGN OF A RESILIENT MPA NETWORK

The objectives of the Kimbe Bay MPA network are twofold: to conserve marine biodiversity and natural resources of the bay in perpetuity, and to address local marine resource management needs. The scientific design of the Kimbe Bay MPA network is based largely on a scientific assessment of biodiversity values, and identifies 15 Areas of Interest that meet specific conservation goals (see Front Cover). The design process involved expert scientific advice, targeted research and monitoring, and an analytical design process (using marine reserve software MARXAN).

Climate change represents a major threat to the long term future of coral reefs and associated ecosystems around the world, including Papua New Guinea. The scientific design of the Kimbe Bay MPA network represents one of the world's first MPA networks specifically designed to address this threat. In recent years, principles for designing MPA networks that are resilient to the threat of climate change have been developed. While most of these principles were applied successfully in Kimbe Bay, some aspects will require refinement over time as new scientific methods are developed and more information becomes available. The design will also be refined as implementation proceeds, with substantial input still required from local communities and other stakeholders.

Finalising the scientific design of the MPA network represents a major milestone for the Kimbe Bay Project, since it provides an excellent blueprint for biodiversity conservation in the bay. This design will form the basis for working with local communities and other stakeholders to refine and implement the design over time. Since communities are the marine resource owners and decision makers in Kimbe Bay, final decisions regarding the MPA network design will be at their discretion.

COMMUNITY ENGAGEMENT

Coastal Community, Kimbe Bay © George Curry

The Nature Conservancy has a long history of community engagement in Kimbe Bay. Several options were considered for engaging communities in the scientific design process, and it was decided that the most effective strategy would be to engage communities after the design had been completed. There were several reasons for this. Firstly, there was concern that engaging all communities in the scientific design process would generate almost unanimous support across the bay, and raise communities' expectations well beyond our capacity to deliver. Indeed we were concerned that we would be faced with the scenario of being asked to support conservation activities in many locations outside key biodiversity areas of interest. Secondly, there are over 100 culturally diverse communities in Kimbe Bay, all of which hold complex and often overlapping traditional rights to sea resources, and it was considered logistically unrealistic to capture all of these communities' views and opinions in a scientific process. The scientific design process was also highly technical, and it was not considered practical for community members to participate in this process. Therefore, it was decided that the most effective strategy was to go through a scientific design process, and identify priority areas for conservation. Once these areas had been identified, the Conservancy would seek to work with communities that own and manage marine resources within these areas through a detailed community-based planning process.

While a full community engagement process was not undertaken during the scientific design process, several steps were taken to understand and incorporate the needs and interests of communities as far as practicable. Considerable informal community engagement was undertaken by field staff while collecting biological data for the design process. Valuable background information was also provided by a detailed socioeconomic study of six communities, which provided an understanding of the variety of socioeconomic situations in the bay. Socioeconomic design principles were also developed and implemented for the MPA network, which were specifically designed to address the needs and interests of local communities and other stakeholders.

IMPLEMENTATION

Pygmy Seahorse © Tammy Peluso

Implementing the design will require multiple strategies for working with local communities and government at a range of scales. Locally Managed Marine Areas will be the primary strategy for nearshore areas, while other strategies will be required for offshore areas. These may include protecting areas through partnerships with the tourism industry and government. Broader scale strategies will also be required for the entire MPA network area, particularly regarding marine resource use and land use management. The implementation process is expected to take approximately five years to complete, and will rely heavily on partnerships with local communities, industry, other NGOs (particularly Mahonia Na Dari), and all levels of government. While not all potential partners were engaged in the scientific design process, those that were have demonstrated support for the MPA network and the scientific design.

In order for implementation to be successful, strong support will be required from local communities and all levels of government (Local, Provincial and National). Meetings with local communities have demonstrated that there is strong support for the MPA network in areas where we already work, although a community engagement process is still required in other areas. The MPA network and the scientific design have also been endorsed by all levels of government. An ongoing commitment to working with local communities, government and other stakeholders will be required for this network to be successful in the long term.

LESSONS LEARNED

This was one of the first attempts to design a resilient network of MPAs, and the first to design an MPA network for Melanesia. Many lessons were learned that may be useful to others undertaking a similar exercise. They include:

- It is important to have a clear plan for the design and a process for achieving it, and for this process to be properly integrated within a broader implementation plan.
- It is important to take implementation into account in the way in which the MPA network is designed, and to identify the most effective strategy for engaging stakeholders in the process.
- There are still some scientific challenges that need to be addressed for designing resilient MPA networks. In the interim, rules of thumb can be used to address these challenges.
- Marine reserve software (MARXAN) is an excellent tool for processing large amounts of information for MPA network design, but it is important to remember that it is a decision support tool and not the decision maker.
- The minimum amount of information required to complete a scientific design of an MPA network is the location of conservation targets, threats and opportunities.
- A multidisciplinary team is required including scientific experts, a GIS specialist, local managers and representatives who can contribute local knowledge and have a clear understanding of the culture, needs and interests of local communities and other stakeholders.
- It takes time, with a minimum of five to seven years required for design and implementation.
- Costs were relatively low compared to those expected for developed countries.

Lessons learned in the scientific design process, and lessons we are still learning in the implementation of the Kimbe Bay MPA network, will be used to inform other MPA design processes in the Bismarck Sea and elsewhere in the Coral Triangle.

Subsistence fishermen in Kimbe Bay © Chris Crowley

The mission of The Nature Conservancy is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

The Conservancy's Pacific Island Countries Program supports marine and terrestrial conservation projects in Melanesia and Micronesia including Papua New Guinea, Solomon Islands, Republic of Palau, Federated States of Micronesia, Republic of the Marshall Islands, U.S. Territory of Guam and the Commonwealth of the Northern Mariana Islands.

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