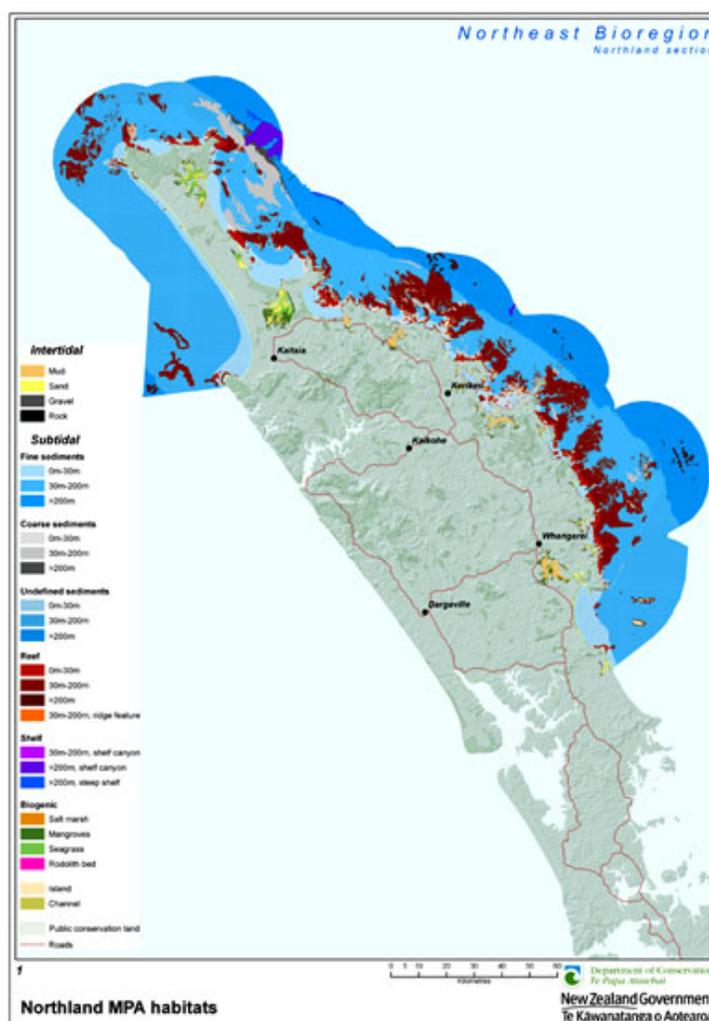


Marine Protected Areas Network Design – Practical Working Guidelines from International Best Practice

Compiled by Vince Kerr

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The Northland Marine Habitat Map (East Coast)¹, an example of marine habitat maps useful to marine protected area planning and design

¹ Kerr, V. 2010: Marine habitat map of Northland: Mangawhai to Ahipara vers. 1. Northland Conservancy, Department of Conservation, Whangarei. 33 p.

Contents

| | |
|---|----------|
| Introduction And Overarching Goal Statement | 3 |
| Core Network Of High Level Protected Areas (Marine Reserves Act) | 4 |
| The Principles: | 4 |
| <i>Representation</i> | 4 |
| <i>Replication</i> | 4 |
| <i>Network Design</i> | 4 |
| <i>Sustainability – Viability</i> | 5 |
| <i>Size Target</i> | 5 |
| Design Strategies - Ecological Considerations..... | 6 |
| Boundary Design Guidelines | 7 |
| The Ancillary Network of Marine Protected Areas..... | 8 |
| Fisheries Regulations | 8 |
| Customary Management | 8 |
| RMA And Regional Councils Tools..... | 9 |
| Other Tools | 10 |
| Special Legislation | 10 |
| Author’s Note | 11 |

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Introduction And Overarching Goal Statement

Two key factors in successful Marine Protected Area (MPA) planning are a healthy participatory process with stakeholders, and achieving understanding and agreement around goals and design guidelines.² This advice paper is intended to provide a set of design principles and practical design guidelines based on international and New Zealand experience. Included here are guidelines on key ecological considerations and selection of boundaries of protected areas. Consistent with the New Zealand Biodiversity Strategy³ and United Nations guidelines⁵, an overarching MPA aim can be stated in practical terms as follows:

Commitment to the establishment of a Marine Protected Area network in New Zealand waters. The network will consist of a core network of highly protected areas (marine reserves established under the Marine Reserves Act 1971 and other highly protected areas), primarily aimed at ecosystem and biodiversity protection/restoration, and an ancillary network of management areas directly linked to fisheries objectives, where fisheries regulations are adopted to improve or restore fish stocks or habitats.

² Bernstein, B., Iudicello, S., Stringer, C., 2004. Lessons Learned from Recent Marine Protected Area Designations in the United States A Report to: The National Marine Protected Areas Center NOAA. The National Fisheries Conservation Center, Ojai, California.

³ Department of Conservation et al., 2000. New Zealand Biodiversity Strategy. NZ Govt Press., 2000.

Core Network Of High Level Protected Areas (Marine Reserves Act)

The Principles:^{4,5}

Representation

To maintain natural examples of the full range of New Zealand marine biota, each region with major differences in marine life must be represented and, within each region, all obviously different habitats must be represented.

Replication

To allow scientifically-valid measurements, to provide for social needs, and to prevent single accidents destroying sole examples, some replicates of each habitat in each region must be included in the reserve system.

Network Design

Since most marine life has free-floating larvae (or other small reproductive and dispersal products) that drift a long way from their parents, single reserves are unlikely to be self-sustaining and the system must be designed as a network. Spacing of reserves is as important as their individual size. As more reserves are

⁴ This section draws primarily from the foundational work of Dr W.J Ballantine. Ballantine, W.J. 2014, [Fifty years on: Lessons from marine reserves in New Zealand and principles for a worldwide network](#). Biological Conservation Volume 176, pages 297-307. 23 published works of Dr Bill Ballantine, <http://www.marine-reserves.org.nz/>.

⁵ The Network Principles outlined here have also been endorsed by the IUCN. See Secretariat of the Convention on Biological Diversity (2004) .Technical Advice On The Establishment and Management of a National System of Marine and Coastal Protected Areas, SCBD, 40 pages (CBD Technical Series no. 13). http://www.marinenz.org.nz/documents/cbd_tech_bulletin_no_13_2004.pdf

created, positive interactions and system benefits increase exponentially. Ideally reserves should be evenly spread through a region or planning area.

Sustainability - Viability

The total area of the high-level protection reserve system must be sufficient to sustain its natural character. Reserves should be permanent or at a minimum generationally reviewed to allow for ecological processes and benefits to be fully realised. Probably this is the most important principle. Without effective leadership, goal setting is often the first thing compromised, typically compromising the entire design process from the outset.

Size Target

Experience has shown internationally and in New Zealand that setting a clear goal in terms of the size and amount of protected areas to be created is crucial for the success of a planning process. Setting a goal and adhering to the design principles also requires the design process to have in place sound technical support to inform participants on costs and benefits of design options considered. This primary role of technical support and the weighting attributed to the technical advice should be clarified at the outset of any process.

Current international scientific consensus is that high-level protected area networks produce maximum benefits to biodiversity, habitats and fisheries productivity where the extent of highly protected areas reaches 20 - 50 % of the total area.⁶

In practice, a target area for the core network of highly protected areas of 10 - 30% of the planning area is commonly adopted internationally⁷. This level would achieve the stated goal in the New Zealand Biodiversity Strategy. Local/regional community planning processes should set their own targets if goal setting from central government is not clear.

⁶ Bohnsack, J.A., et. al. 2000. A Rationale for Minimum 20-30% No-take Protection. 9th International Coral Reef Symposium.

⁷ <http://www.mpatlas.org/>

Design Strategies - Ecological Considerations

1. Size of reserves: big is better and will achieve more in terms of ensuring species and habitats are effectively protected and restored. As noted in point 8 below, reserve boundaries usually become popular and productive fishing locations. This leads to a negative 'edge effect' on the reserve communities, along with a positive effect for the surrounding waters. This dynamic may negatively affect small reserves to a greater degree. Where possible, reserves should cover a minimum of 6 km of coastline and extend out to sea as far as possible. In some cases there may be a strong design case for much smaller reserves. Their effectiveness is less understood but indications are that they are still valuable for some species and habitats.
2. The above principles apply at all scales. Where possible, reserves for a given planning area should attempt to include and replicate all habitats in the area. Reserves that maximize the diversity of habitats represented are preferred.
3. Where possible, avoid boundaries that cut through habitats like reefs.
4. Where possible, include areas of soft sediments surrounding reef areas. There are very important ecological connections between reefs and adjacent soft sediment areas. Ideally the reserve should include soft sediment areas extending 2 km from the reef.
5. Rocky reefs beyond a depth of approximately 30 m represent a different habitat than shallow reefs. The 'deep reef' is dominated by encrusting invertebrates, instead of the algal species that form the community structure of shallow reefs. Where possible, include a continuous sequence of these habitats within a reserve.
6. Appreciate that islands, including little rocks on top of reefs, are hot spots for reef communities and pelagic species for a host of reasons. They provide a lot of habitat diversity with highly varied exposures, currents, upwellings and often-physical complexity. Where possible, include such hot spots completely within a reserve, with surrounding reef. Avoid running boundary lines to them or thinking of them solely as convenient markers.
7. Where possible, avoid disturbance to existing uses of the coastline, such as favorite fishing spots and important customary harvesting sites. Note that there have to be limits to this consideration due to the fact that in many areas the entire

coast is heavily fished, increasing the urgency and also effectiveness of reserve creation.

8. Reserves create new favorite fishing places around their boundaries – this aspect can be noted and enhanced with careful site selection.

9. For some reserves, secondary benefits such as the need for public access or local economic development become important design considerations and may be of primary importance to local communities. These various local considerations should be included and weighted in the design process on a case-by-case basis.

Boundary Design Guidelines⁸

1. Avoid complex boundaries that do not have good natural markers.
2. For shore boundaries, look for a place where any or all of the following features enhance effectiveness of a boundary marker:
 - i) A prominent shoreline feature such as a protruding point, large rock, change in geological formation, middle of a small beach etc.
 - ii) A well known landmark.
 - iii) A position on the shoreline that can be lined up with a second marker placed on a hill or skyline feature in a line behind the shore marker. This can be used for an effective ‘line of sight’ visible for up to several kilometres offshore.
3. Where practical, use east-west or north-south lines to assist navigation.
4. Where practical, for offshore lines, use a line that is close to a bathymetry contour line: this is a helpful locator/ navigation aid for fishermen.
5. Reliance on expensive buoy markers, especially in waters over 20 m depth, is to be avoided if possible.

⁸ Note: The underlying legal position regarding location of marine reserves and applicable rules is interpreted in the legal context of maritime law which requires that any skipper of a boat in New Zealand waters bears a responsibility to know where his current position is at all times in reference to legally gazetted restrictions and navigation rules. Marine reserve boundaries are a legal boundary and are notified in official mariners’ updates and marine charts.

6. For seaward boundaries that have good line of sight, references to land straight lines can be effective.
7. In cases where a shoreline is highly irregular, a seaward boundary may best be defined by a distance offshore description. This method has both advantages and disadvantages.

The Ancillary Network of Marine Protected Areas

Fisheries Regulations

For all waters not included in the core network of highly protected areas, provisions in the Fisheries Act 1996 empower communities to put in place regulations over spatial areas that can effectively support the aims of the overall MPA programme in an integrated manner. Regulations under the Fisheries Act can be utilised to limit or control access to a fishery, equipment used, methods allowed or prohibited, time of year fishing is allowed, recreational bag limits, and/or commercial allocations.

Customary Management

The Fisheries (Kaimoana Customary Fishing) Regulations 1998 in the Fisheries Act lay out procedures and rules for the establishment of customary harvest for tangata whenua/moana. In these regulations special management areas referred to as Mataitai and Taiapure can be created which allow hapu to set rules for these areas to manage and protect the marine resources from a customary management perspective. These processes are led by the iwi/hapu concerned and represent significant opportunities to contribute to the aims of the MPA programme and goals. One other important Fisheries Act regulation is the Sec 186a tool referred to in the Act as a rahui (temporary closure). Via this regulation an application can be submitted to MPI for an area to be temporarily closed to fishing. Some species for specific fisheries purposes can be exempt from the closure, (like kina for example). Usually the rahui is granted for a two-year period and can be extended for a further two years, via a further application to the Ministry of Primary Industries (MPI). In some situations the Sec 186a rahui can be a worthwhile option to begin a restoration process and begin to rebuild the marine community.

Some groups have pursued this option to give themselves some time to further investigate marine reserve options for their areas.

There are some known difficulties however with using the Sec186a rahui tool. The process to establish the rahui with MPI has often been a long and tedious one. Historically there is very little support from MPI for things like signage, monitoring and compliance. The Sec 186a rahui is not well known by the community and fishers generally making compliance challenging for the local community. A further concern regarding this tool is the short-term nature and limited purpose around 'rebuilding fish stocks', which in the context of the Fisheries Act means to rebuild fish stocks for the purpose of exploiting or catching fish stocks that have recovered. Recovery of our local reefs and reef communities can take a generation or more and is a complex ecological process. Lifting the rahui after a few years would achieve little more than provide a short period of locally enhanced fishing. The decision to not roll over the rahui each two years lies with the Minister of Primary Industries so could be taken by the Minister despite the local communities preference to continue with the rahui.

RMA And Regional Councils Tools

In 2016 the Motiti Rohe Moana Trust⁹, (Tauranga) in the aftermath of the Rena wreck on Astrolabe Reef, applied for a Sec186a temporary closure prior to the navigation ban being lifted over the area, (after the wreck no fishing was allowed in the reef area for several years for safety reasons). MPI did not support these efforts to establish a temporary closure in a reasonable time frame and the navigation ban was lifted and fishing recommenced on the restoring Astrolabe Reef. Frustrated with lack of Government support for continued protection of the Astrolabe Reef area, the Motiti Rohe Moana Trust applied to the Regional Council to create a rahui area under the RMA citing the protection of their cultural interest, restoration of mauri for the area and biodiversity values. Bay of Plenty Regional Council declined the proposal stating that this would be in conflict with the Fisheries Act. The Motiti group challenged this decision in the Environment Court and was successful. The decision points the way for Regional Council to control fishing for the protection of cultural values and restoration and protection of biodiversity values. The decision argues that Councils and the RMA

⁹ The Trustees of the Motiti Rohe Moana Trust, Decison No. [2016] NZEnvC 240, ENV-2016-AKL-000173

should work along with and in parallel with management arrangements created via the Fisheries Act. This case is at the time of writing before the High Court in an appeal.

The Motiti case is crucially important and highlights the need to have marine protection tools and processes that are practical and effective in terms of how local people and iwi/hapu define their objectives in parallel with national guidelines for biodiversity protection. Pending the appeal case decision the possibility of a new basket of tools and means for local involvement is a possible result.

Other Tools

There are other tools that may contribute to the overall MPA network especially in estuarine areas where there are special management aims. Wildlife and scientific reserves under the Reserves Act 1977 are two examples of such tools. In some communities voluntary fishing codes could be effective.

Special Legislation

Where a planning area is large and there is significant public interest, one option to meet the varied aims of MPA planning is to formulate an integrated plan that is enacted by an Act of Parliament. Through this process some of the limitations of current legislation can be overcome and the specific needs of a region or community can be addressed through a more holistic process.

Settlements of Treaty of Waitangi claims are typically concluded by the enactment of special legislation drafted on a case by case basis. Within this process there are opportunities for hapu and iwi to negotiate roles and partnership arrangements for the future. Involvement in MPA planning is potentially part of this process.

Author's Note

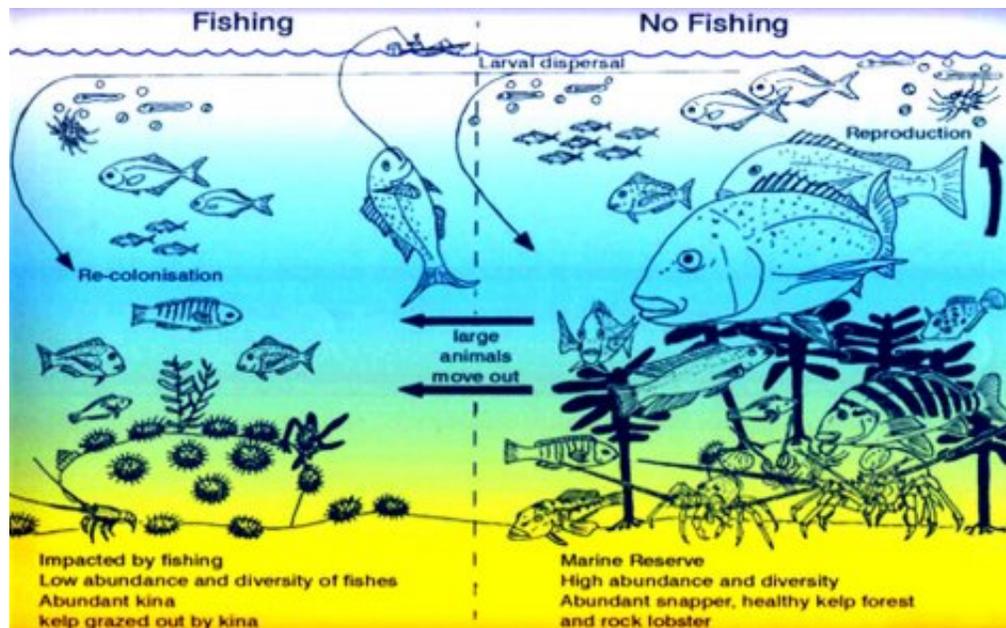
The intention of this guideline is to assist community groups and interested parties to engage in the MPA design process. In attempting this task the best of international information and recommendations, and New Zealand experience has been summarised in this approach. New Zealand has a MPA policy¹⁰ that is being implemented to a limited degree. The recommendations in this guideline are consistent with the MPA policy, but go further to include international best practice and the IUCN guidelines including arguably the most important principle which is to set a clear amount or size goal for the protected areas network which is sustainable. It is the authors hope and recommendation that in the near future our New Zealand MPA Policy is updated to better reflect international practice and support strong outcome focused leadership and goal setting on the part of our Government and Government Departments.

Our marine environment and communities are in urgent need of biodiversity protection and restoration.

*No-one ever makes important changes by hedging
or being vague about the goal*

¹⁰ Marine Protected Areas: Classification, Protection standard and implementation guidelines, February 2008,

<http://www.doc.govt.nz/Documents/conservation/marine-and-coastal/marine-protected-areas/mpa-classification-protection-standard.pdf>



A graphic drawn by Dr Roger Grace comparing inside and outside a marine reserve in northern New Zealand