

Marine Protected Areas Network Design - Working Guidelines from International Best Practice *Compiled V. Kerr Version Sept 21, 2010*

Two key factors in successful MPA planning are a healthy participatory process with stakeholders and achieving understanding and agreement around goals and design guidelines.¹ This advice paper is intended to provide a practical design guideline based on international and NZ experience. Consistent with the NZ Biodiversity Strategy² and United Nations guidelines an overarching Marine Protected Area aim can be stated in practical terms as the following:

We are committed to the establishment of a Marine Protected Area Network in NZ Waters. The network consists of a core network of 'highly protected areas' primarily aimed at ecosystem and biodiversity protection/restoration and an ancillary network of management areas where fisheries regulations are adopted to improve or restore fish stocks or habitats directly linked to fisheries objectives.

High Level Protected Areas *(Using the Marine Reserves Act)*

The Principles:³⁴ *-Core Network - High Level Protected Areas*

1. 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.

2. 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.

¹ 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.

² Department of Conservation et al., 2000. New Zealand biodiversity strategy. NZ Govt Press., 2000

³ This section draws primarily from the foundation work of Dr W.J Ballantine. Reference: Ballantine, W.J. 1997 '[A policy for marine reserves](#)'. A letter to all Members of Parliament in New Zealand in February 1997.

⁴ The Network Principles outlined here have also been endorsed and re-worded in the IUCN document: 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

3. 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 design of the system must be a network. The spacing of the reserves is as important as their size. As more reserves are created positive interactions and system benefits increase exponentially. Ideally reserves should be evenly spread through a region or planning area.

4. 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 generationally reviewed to allow for ecological processes and benefits to be fully realized.

Size Target -Core Network - High Level Protected Areas

An target area for the core network of highly protected areas of 10%-30% of the ‘planning area’ is a commonly adopted target internationally. This level would achieve our stated goal in the NZ Biodiversity Strategy. Local/regional community planning processes may choose to set their own targets. Current scientific opinion internationally states 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 % reaches of the total area.⁵

Design Strategies - Ecological Considerations -Core Network - High Level Protected Areas

1. Size of reserves: big is better and will achieve more in terms of species and habitats that are effectively protected/restored. Usually reserve boundaries become popular and productive fishing locations. This leads to a negative ‘edge effect’. Small reserves are affected to a larger degree. Where possible reserves should be a minimum of 6km 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 of a given area. Reserves that maximize the diversity of habitats represented are preferred.
3. There is a strong argument to avoid boundaries which cut through habitats like reefs if it can be avoided.

⁵ Bohnsack, J.A., et. al. 2000. A Rationale for Minimum 20-30% No-take Protection. 9th International Coral Reef Symposium.

4. Include areas of soft sediments surrounding reef areas if at all possible – there are very important ecological connections between reefs and the adjacent soft sediment areas. Ideally these soft sediment areas should extend 2km from the reef.
5. Rocky reefs beyond approx 30m depth are a mostly different community than shallow reefs. The ‘deep reef’ is dominated by encrusting invertebrates instead of algal species which form the community structure of shallow reefs. Where possible a reserve should include a continuous sequence of these habitats within the 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 and often physical complexity. Include them completely with surrounding reef if at all possible - avoid running boundary lines to them or thinking of them as good markers (they may be of course but also they are biodiversity hot spots).
7. Reserves where possible should avoid disturbance to existing uses of the coastline, examples are favorite fishing spots and important customary harvesting sites. Note that there has to be limits to this consideration due to the fact that in many areas the entire coast is heavily fished, thus the urgent needs for reserves.
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 become important design considerations such as the need for public access, local economic development etc. These considerations can be included in the design process on a case by case basis as they are very real to communities.

Boundary Design Guidelines⁶ -Core Network - High Level Protected Areas

For shore boundaries look for a place where any or all of the listed features enhance effectiveness of a boundary maker.

1. Prominent shoreline features such as a protruding point, large rock, change in geological formation, middle of a small beach etc.
2. Well know landmark

⁶ Note: Note that the underlying legal position regarding location of marine reserves and applicable rules is interpreted in the legal context of maritime law which states that any skipper of a boat in NZ 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 mariner’s updates and marine charts.

3. A position on the shoreline that can be lined up with a second marker placed on a hill or skyline feature lying in a line behind the shore marker. This is can used for an effective 'line of sight' visible for up to several kms offshore.
4. If practical use east-west or north-south lines which assist navigation.
5. Avoid complex boundaries that do not have good natural markers
6. If practical for lines off shore use a line that is close to a bathymetry contour line, this is helpful locator/ navigation aid for fisherman.
7. Reliance on expensive buoy markers especially in waters over 20m depth is to be avoided if possible.
8. For seaward boundaries that have good line of sight references to land straight lines can be effective.
9. In some 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 Net of Marine Protected Areas

Fisheries Regulations - Ancillary Network

For all waters not included in the Core Network of Highly Protected Areas provisions in the Fisheries Act allow for communities to put in place regulations over spatial areas that can in effect support the aims of the overall Marine Protected Area program in an integrated manner. Fisheries regulations can focus on limiting or controlling 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 - *Ancillary Network*

The Kaimoana Regulations in the Fisheries Act lay out procedures and rules for the establishment of customary harvest for Tangata Whenua/Moana. These processes are lead and by the Iwi/hapu concerned. Within this process there is some important opportunity to contribute to the aims of the Marine Protected Areas program and goals.

Other Tools - *Ancillary Network*

There are a host of other tools that may contribute to the overall MPA network especially in estuarine areas where there are special management aims. Wildlife and Scientific reserves are two such tools that could apply.

Special Legislation - *Ancillary Network*

Where a planning area is significant and there is significant public interest it is an option to meet the varied aims of Marine Protected Area Planning by formulating an integrated plan that is enacted by an Act of Parliament. Through this process some of the limitations of current legislations can be overcome and the specific needs of a region or community can be addressed via a more holistic view of the process.

Typically Treaty Settlement is brought about finally by the enactment of specific treaty settlement legislation on a case by case basis. Via this process there is opportunity for hapu and Iwi to negotiate roles and partnership arrangements for the future. Involvement in Marine Protected Areas is potentially part of this process.⁷

⁷ Editors note and caveat: 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 very best of international information and recommendations has been taken and summarised in this approach. NZ has a Marine Protected Area Policy that is being implemented to a limited degree and aspects of the Policy are currently under review. The recommendations in this guideline are consistent with the Policy. Some aspects exceed minimum guidelines of the current Policy. This guide is intended as supporting advice to all those people engaged in this process reflecting best international practice. It is not intended to specifically convey a current Govt position.