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# MARINE BIODIVERSITY

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## SUMMARY

Since we have not yet described the majority of marine species in NZ seas, since we know very little about the range and effect of most potential impacts, since we are not even sure we can identify the driving forces sustaining marine ecosystems, we need some *generally* effective method to conserve marine biodiversity.

The only practical and generally effective method of protecting NZ's marine biodiversity is to establish a representative network of no-take and undisturbed marine reserves at a level which is self-sustainable.

This programme would be *in addition* to all detailed and analytical methods which seem helpful or necessary e.g. controlling land-run-off, minimising water-borne pollutants, preventing the introduction of exotic species, improving fishing methods, identifying more species, classifying all the marine habitats, monitoring impacts and natural variation, etc.

NZ has had 30+ years of public discussion on marine reserves, 20+ years of practical trials, and 10+ years of developing a range. The idea is practical.

Not only is it practical to establish an effective system of marine reserves. It is politically, socially, and economically desirable to do so. There are many advantages of marine reserves beyond their effects on marine biodiversity – including scientific, cultural, educational, recreational, managerial benefits, as well as support for harvested species. These additional benefits are not trivial and provide for wide public support provided the approach is for a full system based on principles.

## INTRODUCTION

The draft stataegy on biodiversity (DoC et al, 1998) is not yet government policy, but a draft for public discussion (see its title page). Under Theme 3 it discusses "Coastal and Marine Biodiversity"(pp 47 – 56). It lists the "Desired Outcome for 2020" (p. 47), and an "Action Plan" with "Objectives" and "Actions"(pp 53-55). It gives some

background information on the present state of affairs, current management and the issues (pp 47-52).

At first sight it seems a reasonable document. Most of the right words are in there somewhere. But with further analysis it looks weaker and less sensible. The closer the examination the worse it gets. Even when key facts are clearly stated, these are rarely connected, and the obvious consequences are rarely followed to the point of actual recommendations. At the action level – what will be done if this strategy is approved as it stands – there is little other than an intention to try harder along present lines and promises of more consultation, investigation and discussion.

The draft strategy correctly states (selected actual quotes):

(i) NZ marine ecosystems and species are highly diverse (p.47)
(ii) Many species are yet to be discovered (p 47)
(iii) We have (cf land) very little information on marine biodiversity (p.48)
(iv) Our current knowledge is not adequate to know whether we are sustainably managing NZ's marine biodiversity (p. 49)
(v) NZ's marine environment is managed by several different agencies, often for competing purposes (p.48)
(vi) Management of the marine environment over the past century has largely focused on sustaining fisheries for use rather than protecting marine biodiversity (p 47)
(vii) NZ's marine reserves cover only a tiny area (0.1% apart from Kermadecs) of NZ's marine environment and are not representative of the range (p.51)

Taken together, these undisputed facts make it clear that the only practical way to ensure a reasonable degree of protection for marine biodiversity would be to expand the marine reserve system – i.e. make a self-sustainable and representative network of areas exempt from harvest and other forms of direct human exploitation and interference.

This is *partially* recognised under **Objective 3.4**. (p.54), which states :

"Manage a comprehensive and representative range of natural marine habitats and ecosystems to effectively conserve marine biodiversity using a range of appropriate mechanisms including legal protection."

It is hard to object to the broad form of wording here – it could as easily be well-meaning as deliberately vague. When, however, we get to the Actions listed (p. 54), it is clear that the commitment to create an effective set of reserves is, at best, tentative.

**Action a)**

Wants to "protect marine biodiversity" but does not say what the habitats and ecosystems are to be protected from. Only marine reserves provide full protection.

Lumps marine reserves (the only directly effective method of conserving marine biodiversity) with all other management methods (which may have incidental effects on biodiversity). It gives no emphasis or priority to marine reserves.

Wants to "develop…. a strategy for establishing a network of areas that protect biodiversity". This document is supposed to be the strategy for such matters. The principles for an effective strategy are already well-known and widely-accepted . They stem directly from the facts listed above and should be stated clearly here and now.

It includes the word "implement" but this is so hedged about – see above - it is far from clear what, if anything, would actually be implemented. If the principles for an effective networks of reserves were stated (Ballantine, 1997), it would be reasonably straight-forward to give a clear indication of implementation – including, if necessary, the stages of this.

**Action b)**

Marine biodiversity does not recognise any limitations in terms of distance from land. The Marine Reserve Act should be amended as soon as possible to allow 'no-take' and undisturbed areas out to the 200 nautical mile limit, or new legislation achieving the same effect should be passed. Australia has already taken action on these lines in the Great Australian Bight.

The only other necessary change to the Marine Reserve Act is the cancellation of a previous amendment that permitted some kinds of fishing inside a marine reserve under certain conditions . The only time this amendment was seriously applied was at the Poor Knights. 17 years later, after steadily increasing public furore, two major rounds of public submissions and various court actions, all fishing was cancelled.

The usual criticisms of the Marine Reserves Act – that it is 'for science' and (apart from amendment mentioned above) it very restrictive about any disturbance – are in fact its great virtues, especially for the protection of biodiversity. Science can be carried out anywhere so this is not in fact restrictive (even if the original drafters intended it to be so). Marine reserves have already been established under the Act over the full range of possible habitats – from a part of a sheltered harbour in the Auckland metropolis (Pollen Is) to a piece of open ocean up to 3000m deep (Kermadec Is).

**Action c)**

This is both unnecessary and – as worded – impractical. While simple forms of biogeographic classification will inevitably be considered, no additional work is necessary. Furthermore anyone with experience in this field knows that no two experts ever agree on the finer points. Provided full representation is planned, this is not a problem (Ballantine, 1997).

Objective 3.4 should be moved so that it is the first in this theme. Its statement should include the basic principles for effective action i.e. the establishment of a network of representative marine reserves that are no-take and undisturbed by any direct human interference, but open for the study and appreciation of the resulting natural conditions. The actions listed should be restated so that they are real actions (not just developments or reviews). The implementation of a representative network of marine reserves should be the first action and time limits should be included (Ballantine, 1998).

**General approach to action**: (pp 53-55)

Taken separately, each of the "objectives" stated, could be justified logically and practically, given the existing system of administration and law. However, the set of objectives as a whole does not sensibly reflect the facts that were given earlier in the document (see above.)

**Objective 3.1** Improving our knowledge of coastal and marine ecosystems

Having spent most of my working life doing precisely this, I naturally welcome any official encouragement. However, as citizens recommending action, we must be practical about the actual problem. Even if our knowledge in this field was increased by an order of magnitude (which is unlikely in the near future) we would still be very ignorant about most marine species and many marine habitats. We would still not be able to "identify, assess and rank the risks" to a very large proportion of our marine biodiversity. All of this is generally true worldwide (Norse, 1993).

Of course we should try hard to improve our knowledge, but it is misleading to make this is the first objective in an action plan. If we are going to achieve any really effective form of protection for marine biodiversity, it will have be done by using existing and established principles, not detailed and analytic knowledge.

I am pleased and proud to have been part of the large and rapid increase in knowledge of marine biology over the past 40 years. But since this increase is continuing, and shows no signs of slackening, we must conclude that our ignorance is still the predominant factor.

The surface logic of the proposed "actions" tends to obscure a more important point. We already have enough knowledge to take effective action using principles. It is unlikely in the foreseeable future we would have enough knowledge to act in analytical detail on more than a trivial proportion of species, habitats, localities and risks. Furthermore, one of the major difficulties in assessing natural biodiversity and any impacts on it, is the absence (except for the few existing marine reserves) of undisturbed areas to study as such and to provide comparisons and controls.

While it would be very helpful if we established a "classification system for the full range of marine environments" and a "monitoring system" to show the effectiveness

of our measures regarding adverse effects on marine diversity, these are not the priorities. The public interest does not depend on this kind of scientific demonstration. It does depend on action that will give a high probability of success.

I have been actively engaged marine biogeographic classification and marine monitoring since the 1960's. I enjoy such work, I regard it as important, I think we have made some progress and I would like to make more. But a worthwhile action plan on marine biodiversity, does not require any more information. The main reason for this is already given in the strategy.

The strategy states they we need a network of representative areas (p 47 & 54). The properties of networks are simple, but seem strange to those trained in analytical thinking. Networks can be started at almost any point, they can be extended in almost any direction, they can be improved by additions that are almost random. No precise piece of a network is essential, but any part of it contributes to the whole. It follows that we can begin immediately to create a network and can improve it as and when more information becomes available.

This objective should be moved down the list (at least to 2nd) and it should be reworded to make it clear that more information, while helpful, is not necessary for action.

**Objective 3.2**. Sustainable coastal management

The NZ Coastal Policy Statement needs to include a direct requirement to facilitate the establishment of a representative marine reserve network. The present state of affairs, with marine reserves specifically excluded, is absurd and impractical.

Marine reserves (as such) do not protect marine biodiversity against land-derived run-off or water-borne pollutants. Consequently there should be some extra level of attention to run-off near marine reserves. This should be carefully worded so as not to provide new opposition to marine reserves. The 'extra level' should apply more to preference for official assistance than to enforcement of higher standards.

Regional Authorities need to know the principles and requirements for the marine reserve network and to be encouraged to participate in the precise selection. Provided that principles for the required marine reserve network are properly stated (e.g. in the NZ Coastal Policy Statement) it is practical and sensible to allow (indeed encourage) regional and local selection of precise sites.

**Objectives 3.3 and 3.6** Coordinated marine management and sustainable marine harvest practices.

The connections between fisheries and marine biodiversity are complex and subtle. There is no simple, direct and necessary link. If a fishery was managed to be biologically and commercially sustainable, it could still affect marine biodiversity

anywhere in the range from very low to very high. There is no guarantee, or even a reasonable probability, that if all fisheries were sustainably managed this would produce a satisfactory result for biodiversity.

Involving fisheries management in marine biodiversity issues is sensible and necessary, but it should be handled carefully. Fisheries managers already have a clear but difficult task. Simply loading them with additional and possibly conflicting concerns is not helpful.

One way in which fisheries scientists and managers could help themselves and this issue, would be to support a network of no-take marine reserves. There is steadily growing evidence (both pragmatic and theoretical) that no-take areas are directly useful to fisheries science, management and the industry (e.g. PDT, 1990; Roberts and Polunin, 1991; Dugan and Davis, 1993; Rowley, 1994; Bohnsack, 1996; Roberts, 1997; Guenette *et al*, 1998). Some leaders in this field are already convinced of the need for action (e.g. Dr Tony Pitcher, director UBC Fisheries Centre, quoted in Schmidt, 1997).

**Actions a) , b) and c)** under Objective 3.3. need the establishment of a network of marine reserves (including in the EEZ) to become meaningful.

**Actions a) and b)** under Objective 3.6 can only be carried out effectively if there is a network of marine reserves.

**Objective 3.5** Managing marine biosecurity risks

This needs some rewording to stress the fact that there is only one chance to keep out exotic marine species – stop their entrance. So far as I am able to determine, there is no case, anywhere in the world, where a marine species was successfully eradicated after it became established in the wild. Even for large sessile species in the intertidal (e.g. *Spartina*) eradication has not, so far, proved practical. Consequently 'border control' is the only effective option.

**Objective 3.7** Threatened marine and coastal species management

There are a few marine species (mostly mammals, bird and a few fish) about which we have enough data to be analytical – i.e. measure abundance trends, identify impacts, make detailed recommendations). This is already happening where it is possible.

But the notion that this can be extended in any important sense is simply wishful thinking. Even if the data was available, various species were entered on threatened species lists, and harvesting or damaging them became a crime – it is unlikely that this would be of any practical help to a species of sponge, a sea slug, a deep sea coral or even an intertidal blenny. The only practical way we can help the great majority of marine species is to have areas (marine reserves) where species are protected from all forms of disturbance.

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