

Comments on “A Marine Reserve for Great Barrier Island?”

Thank you for the opportunity to comment on the discussion document and questionnaire on the Department of Conservation’s proposal for a marine reserve on the north-east coast of Great Barrier Island.

Introduction

The New Zealand Seafood Industry Council Ltd (SeaFIC) is the primary umbrella organisation representing the generic interests of all sectors of the New Zealand seafood industry, a sector that includes fishers, marine farmers, seafood processors, wholesalers, retailers, and exporters. SeaFIC is owned by 27 shareholders – each of which represents a particular sector of the seafood industry. Our shareholders collectively represent around 94% of the seafood industry by value.

You will be aware that the seafood industry’s interest in marine reserves is significant. The well-being of the marine environment is fundamental to the industry’s economic, social and environmental contribution to New Zealand. The seafood industry is also a major rights holder and user of resources in the marine environment. Secure rights of access to the marine environment underpin the industry’s contribution and are also fundamental to protecting the integrity of New Zealand’s fisheries management regime.

The industry acknowledges that marine reserves have a role to play as one of several available tools for managing the marine environment. Because marine reserves can have significant economic and social impacts on sustainable extractive uses, we are interested in ensuring that marine reserves are established only where analysis demonstrates that:

- a marine reserve is the best management tool for achieving the identified protection objectives; and
- the benefits of having a marine reserve outweigh the costs, and any costs on existing uses and values can be avoided, remedied or mitigated.

As SeaFIC’s interest in marine reserves and the protection of marine biodiversity is generic rather than specific, we will not be responding to the specific questions in your questionnaire. Instead, we take this opportunity to comment on the discussion document and provide an indication of the type of information and analysis that we would expect to be included in a formal application for a marine reserve at Great Barrier Island, should it be decided to pursue such a course.

General comments on the discussion document

SeaFIC considers that *A Marine Reserve for Great Barrier Island?* is an overly simplified document that does not provide readers with the necessary factual information or analysis to make an informed judgement on the merit of the proposed reserve. General claims are made about fishing impacts and about the benefits of the proposed reserve but no supporting material is presented or cited. Standard concepts fundamental to the protection of marine biodiversity are misrepresented and misused in support of the creation of a reserve (see below for more detailed comments). The discussion paper proposes to exclude fishing from a large area because of its perceived impacts on ecological values, but neither the ecological values of the area nor the alleged fishing impacts are properly assessed and described.

From the fishing industry's point of view, this situation is far from satisfactory, given the importance of issues such as potential loss of access to marine resources. We understand that this document is only a discussion paper and that a formal marine reserve application may be developed at a later stage. However, this discussion paper is still part of a community consultation process and should provide sufficient and relevant information. It is of particular concern to SeaFIC that ill-informed comments on the discussion paper may be used in developing the formal marine reserve application by the Department of Conservation.

We also recognise that information to justify scientifically the establishment, location and size of a marine reserve is usually sparse and expensive to collect. However, an up-front approach which acknowledges the lack of information would be preferable to the use of unconvincing and unsupported generalisations. A pragmatic and consultative approach, rather than a reliance on feel-good statements and unsupported assertions of benefit, would do more to increase stakeholders' confidence and give them incentive to contribute to the process.

Purpose of the marine reserve – scientific study or biodiversity protection?

The discussion document contains confused messages about the proposed purpose of the marine reserve. If the reserve is to be established under the existing legislation (the Marine Reserves Act 1971), then it must be “for the purpose of preserving... for the scientific study of marine life, areas of New Zealand that contain underwater scenery, natural features, or marine life, of such distinctive quality, or so typical, or beautiful, or unique, that their continued preservation is in the national interest”.

However, the document contains little information on the proposed scientific study programme for the area, or explanation of why a marine reserve is required to facilitate any such study.

Recommendation: If a formal application proceeds under existing legislation, further justification of how the proposed reserve will contribute to scientific study of marine life is required.

Rather than focusing on the merits of the area for scientific study, the document focuses on some of the concepts underpinning the use of marine reserves to protect biodiversity – specifically, the concepts of “networks” of protected areas and “representativeness”. These concepts have been established over the past decade and are extensively described in the national and international literature advocating marine reserves for biodiversity protection purposes. The discussion document misrepresents these concepts in several important respects.

Protection targets

The document refers in several places to the New Zealand Biodiversity Strategy (Objective 3.6, action point b) which is “to achieve a target of protecting 10% of New Zealand’s marine environment by 2010 in view of establishing a network of representative protected marine areas”. The Biodiversity Strategy makes it clear that this objective is to be achieved through a range of mechanisms, not just marine reserves¹. This multi-mechanism approach to achieve the protection target is contrary to the approach implied on page 9 of the discussion document, which misrepresents the level of protection currently existing in the marine environment by counting only the areas covered by marine reserves.

Regardless of the justification or otherwise of having a 10% protection target, SeaFIC is aware that there is a lack of public understanding of how a 10% target might be

¹ See for instance, Objective 3.6: *Protect a full range of natural marine habitats and ecosystems to effectively conserve marine biodiversity, using a range of appropriate mechanisms, including legal protection;* and Action a) *Develop and implement a strategy for establishing a network of areas that protect marine biodiversity, including marine reserves, world heritage sites, and other coastal and marine management tools such as mataitai and taiapure areas, marine area closures, seasonal closures and area closures to certain fishing methods.*

implemented, with many people holding the mistaken view that marine reserves are the only available protection mechanism. It is disappointing to see this misconception reflected in a government discussion document.

Recommendation: Clarify that the Biodiversity Strategy protection target is intended to be achieved through a range of mechanisms including, but not limited to, marine reserves.

If the Biodiversity Strategy is to be used as part of the reasoning for establishing a marine reserve, it follows that the application should contain an analysis of why a marine reserve is the most appropriate tool to achieve the protection objectives, and how the specific marine reserve will contribute to the “network of representative areas” (see further comments below).

Networks of marine protected areas

Page 4 of the document implies that the proposed reserve will contribute to a “network of marine protected areas” and that this network will provide “a series of safe havens within movement range of adults or juveniles”. However, no information is provided on the overall plan for the “network” and how it might be established. If this network is to truly provide safe havens for species moving between reserves, or to boost populations through source-and-sink mechanisms as is referred to on page 5, its design would require much more information and sophisticated procedures to select and design marine reserves than the ones described in the discussion paper.

A network does not simply mean “more than one marine reserve”. It implies a significant degree of analysis and planning according to pre-determined criteria and with overarching objectives as to what the network is intended to achieve. There is no evidence that the proposed marine reserve location has been selected on the basis of characteristics usually required for establishing a network (eg., functional connectivity, representativeness at regional and national scales).

Recommendation: Provide further information on the “network” that the proposed marine reserve is intended to contribute to, and the manner in which that contribution will be achieved.

Representativeness

The term ‘representative marine habitats’ is used in the document (eg., page 4) but is not explained. Further, the statement (page 8) relating to some habitats in the proposed reserve being of particular interest because they are not ‘represented’ in marine reserves elsewhere indicates some confusion between representativeness and comprehensiveness, two of the fundamental concepts underpinning the design of marine reserve networks. The definitions of representativeness and comprehensiveness are as follow:

- **Comprehensiveness:** a national network of reserves should include the full range of ecosystems identified nationally; and
- **Representativeness:** individual reserves should reflect the biodiversity of the ecosystem they come from.

Without some form of classification of the marine environment and some identification, even preliminary, of the full range of ecosystems in New Zealand waters, it is difficult to know what the Great Barrier Island marine reserve may be representative of. In any case, representativeness is not mentioned in the Marine Reserve Act 1971 which refers only to the protection of ‘typical’, ‘beautiful’ or ‘unique’ characteristics of the area.

Recommendation: Clarify why, and of what, the proposed marine reserve is representative.

Site selection

The discussion document does not describe how the area proposed for the reserve was selected nor the criteria for site selection. For example, have only ecological criteria been considered or have socio-economic criteria also been taken into account, and how? In the absence of such information, it appears that the Great Barrier Island marine reserve site has been selected in an *ad hoc* and opportunistic manner. This goes against international trends aiming at developing national networks of representative marine reserves and thus avoiding the well known ‘hot spot’ syndrome.

The ‘hot spot’ syndrome is well illustrated in the discussion paper by the way ecological values are described (pages 8, 10-13) – ie., listing broad geomorphological areas (eg. estuarine, beach, reefs, sediment areas) that the reserve will cover, listing iconic species, and giving snap-shots of some selected habitats. Sentimental and emotive statements about the spectacular beauty of marine habitats and communities do not alleviate the need for factual information on, and proper analysis of the ecological importance of, and threats to, the area proposed for a marine reserve.

Recommendation: Provide further information on the criteria and rationale for site selection, and an analysis of alternative sites.

Marine reserves and fisheries management

Throughout the discussion paper, fishing is repeatedly presented as the main cause of impact in the area of interest and the main reason for the creation of the marine reserve (see objective 4, page 15). The paper asserts that fisheries rules do not protect the large and old marine animals (page 5). There is reference to local residents’ perceptions that “fish aren’t as plentiful as they used to be in the ‘old days’” (page 3, 4) and a statement about marine reserves helping “rebuild depleted stocks of snapper, crayfish and other species” (page 5). A claim is also made on page 6 that “fishing is likely to improve in areas near the reserve and, in the long term, may benefit fish stocks further afield”.

However, the document does not provide any information or references to support these claims. SeaFIC is particularly concerned about the misleading and unreferenced statements contained in the discussion document concerning the alleged fisheries management benefits of marine reserves.

Literature reviews

We draw your attention to a recent study undertaken by the Australian Bureau of Rural Sciences and CSIRO². The authors of this study undertook an extensive review of the international scientific literature on the effectiveness of marine reserves for fisheries management purposes. The review focuses on the effectiveness of marine sanctuaries/no-take areas that have been established specifically for fisheries management purposes, documenting potential and realised benefits for fisheries.

The authors note that there are few well documented examples of no-take reserves being used as part of fisheries management. While there is reasonable evidence of benefits inside reserves (eg., increase in fish abundance) in the literature, there is virtually no empirical evidence for the key benefits outside reserves (spillover, larval export, stability of fisheries production). Further, the majority of studies into fish abundance concentrate on large coral reef predatory fish, which are the most targeted species in tropical fisheries and the most severely affected by fishing (because of their slow growth rate, low reproductive rate and territorial behaviour). Much less is known about the effect of marine reserves on other ecosystems (e.g. continental shelf, open oceans).

The study referred to above also notes that experiences of tangible fisheries benefits outside marine reserves are often limited to either the recovery of highly depleted stocks or to subsistence-scale tropical reef fisheries under little formal management. There is little documented evidence that no-take reserves improve fisheries yield in fisheries already under tight management controls such as those imposed by New Zealand's Quota Management System. The study also notes that marine reserves have the potential to significantly reduce net benefits for commercial fisheries and concludes that "there are no well-documented examples where marine fishery sanctuaries have been shown to provide and maintain net economic benefits for previously existing fisheries" (Ward et al. 2001). This is an increasing concern if large reserves in both inshore and offshore areas are to be created.

The authors conclude that it is difficult to assess whether no-take marine reserves are useful tools for fisheries management because there are few such reserves worldwide. At present, much of the evidence of fisheries benefits that is used to promote marine reserves for fisheries management purposes is largely theoretical and circumstantial.

As Holland (2002) notes, there are serious limitations to our ability to address these issues with empirical research. Doing so rigorously would require a number of replications over long periods with comparisons to controls, and even then might only provide conclusions valid for very specific sets of circumstances. The full impacts of reserves can take many years to be realised and will be confounded by environmental and regulatory changes.

Modelling studies provide an alternative approach to evaluate basic questions about how reserves of various designs in various environments might affect fisheries. Several

² Ward, T J, Heinemann D, & Evans, N (2001). The role of marine reserves as fisheries management tools: A review of concepts, evidence and international experience. Bureau of Rural Sciences, 184pp.

published modelling studies of marine reserves and closed areas for fisheries suggest that a correctly sized marine reserve may increase yields in fisheries that are subject to growth or recruitment overfishing, but that little if any yield increases can be achieved in fisheries where effort is already at the level that produces maximum sustainable yield or maximum yield per recruit (e.g., Beverton and Holt 1957, Guénette and Pitcher 1999, Hannesson 1998 and 2002, Hastings and Botsford 1999, Holland and Brazee 1996, Nowlis and Roberts 1999, Polacheck 1990, Rodwell et al. 2002, Sanchirico and Wilen 1998, 1999 and 2002, Smith and Wilen 2003).

Closures for fisheries management purposes

Fisheries agencies worldwide have long used area closures as part of fisheries management. However, the principles governing fisheries and conservation approaches to using spatial closures differ significantly and, at times, may conflict with each other. Optimal designs for area closure differ between areas closed for biodiversity protection and areas closed for fisheries management purposes. Areas closed for fisheries management purposes are normally designed to benefit a limited number of target species, which requires detailed knowledge of the species spawning and dispersal behaviour. By comparison, biodiversity protection MPAs aim to protect whole ecosystems and are designed according to the concept of representativeness.

Recommendation: If a formal application is to proceed, it should provide detail (through the use where possible of published research) of the fisheries that operate in the area, the types of gear being used, and the nature and extent of any impact on ecological values. If fishing impacts are identified, then it needs to be assessed whether a marine reserve is the best tool to address these impacts, or whether fisheries management tools are more appropriate.

Any claims of fisheries management benefits arising from the establishment of a marine reserve should be justified with reference to:

- (a) appropriate literature that reflects an understanding of New Zealand's fisheries management regime; and
- (b) appropriate analysis.

Size of the proposed reserve & fisheries management implications

In the section '*Does size matter?*' (page 9), the paper rightly says that the best size for a marine reserve depends on what is being protected. However, the paper then goes on to say that a large marine reserve is preferable in order to minimise fishing impact (the so-called 'edge effect'). Thus, the need for the large size of the Great Barrier Island reserve is justified by a perception of fishing impacts, but without providing any information on how these presumed impacts affect the communities and species to be protected.

We also note that the claim that "fishing is likely to improve in areas near the reserve" (page 6) contradicts the later discussion on the relation between the size of the reserve and the 'edge effect' (page 9). In fact, the 'edge effect' is a much desired effect when expecting fisheries benefits (then referred to as 'spill-over').

Objectives and marine reserve management

Establishing clear objectives

The objectives of the Great Barrier Island marine reserve listed on page 15 are very generic and it is unclear how they relate to the specific features of the proposed reserve. There is also confusion between objectives and benefits (outcomes) as shown in the paragraph '*What are the benefits*' (page 5). The repeatedly stated goal of protecting the marine environment for the benefits of present and future generations is too generic to be of any relevance. Generic goals need to be translated into clear objectives at the local level, based on analysis of the ecological values that require protection, and assessment of any threats they may be under. Without clearly defined objectives and measurable outcomes it will be difficult to assess whether or not the proposed reserve is effectively protecting biodiversity.

Recommendation: Develop clear objectives and outcomes that reflect both the specific values that require protection in the proposed marine reserve, and the identified threats to those values.

Management strategy and planning

The document does not describe any management strategy once the marine reserve has been declared. There are no details on any monitoring programme or enforcement plans. The declaration of a marine reserve may eventually fail as a marine resource management and protection tool if its performance is not monitored. Scientists often warn that it will be difficult to assess the performance of marine reserves without carefully designed monitoring plans. With regard to enforcement, it appears that, and as observed for many marine reserves elsewhere, managers optimistically rely on community support and involvement to ensure compliance with regulations (page 7). It remains to be demonstrated whether such community support exists and/or is capable of ensuring compliance in practice.

Recommendation: If a formal application proceeds, the application should include a clear management strategy to achieve the identified objectives and outcomes of the proposed reserve, and a monitoring programme to evaluate whether the reserve objectives are being met.

Assessing potential impacts of the marine reserve

The section '*Uses of the north-east coast*' (page 6) does not provide sufficient details on current commercial and non-commercial uses in the area proposed for the reserve or how important these uses are to stakeholder groups and the local community. It is stated in the next section '*How would a marine reserve affect you*' (page 6) that 'a marine reserve on the north-east coast may have economic and social implications for commercial and recreational fishers in the area', but no analysis of these implications is presented. In the case of fishing, it is now well documented that marine reserves can have adverse biological and socio-economic effects through displacement of fishers and concentration of fishing effort in non-reserved areas. Except in the case of tangata whenua (page 7),

there is no indication of any mechanisms to mitigate impacts and accommodate users' needs.

SeaFIC considers that, given the potential impacts of marine reserves, all marine reserve proposals should undergo an assessment of their costs and benefits so as to ensure that the non-extractive benefits of a system of marine reserves are achieved effectively and efficiently and that marine reserves do not compromise or interfere with other marine management systems already in place. In general, a benefit-cost analysis should attempt to determine whether the proposed reserve provides greater net benefits than some alternative policy. The basis for comparison might be the status quo or might include alternative policies designed to achieve similar objectives. Quantification and valuation of costs and benefits from a marine reserve is likely to be difficult and imprecise due to uncertainty about the direct and indirect impacts of a reserve and of what would happen in the absence of a reserve. However, the difficulty of this task should not be used as an excuse to avoid it completely.

A complete economic evaluation of a marine reserve should also explore the probable distribution of benefits and costs. Even if a marine reserve does have positive net benefits overall, it is likely to disadvantage some individuals and groups. Compensation of losers in some form may be necessary or advisable to ensure the acceptance and success of the marine reserve. Marine reserves perceived as unfairly imposed are likely to require higher compliance costs and may generate political action that will block the creation of a reserve or lead to its failure or repeal.

Recommendation: Any formal application should contain:

- (a) details on the social and economic impacts of the proposed reserve on existing uses and values, and contain measures to avoid, remedy or mitigate any such impacts; and
- (b) an analysis of the costs and benefits of the proposal.

Other matters

The lack, throughout the paper, of referenced information and details of data sources, scientific and non-scientific, is of serious concern. There are references to '*New discoveries*' (page 3), to a recent study at Leigh Marine Reserve (page 9), to surveys (page 10), to 'site survey and investigations' (page 14), but none are properly referenced.

Recommendation: Include references for all information referred to in the document.

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References

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