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# Governing the Exclusive Economic Zone: The Ocean Commons, Cumulative Impacts and Potential Strategies for Improved Governance

Prepared by
**Katherine Andrews**

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# Ian Axford (New Zealand) Fellowships in Public Policy

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Katherine Andrews
Wellington, July 2008

# EXECUTIVE SUMMARY

From the time of the Roman Empire, the oceans were considered common to all. The doctrine of "freedom of the seas" prevailed, and nations' seaward jurisdictions were limited to three nautical miles. In the middle of the 20th century, this three-mile limit began to erode. After years of negotiations, nations were granted "sovereign rights" to Exclusive Economic Zones (EEZ) out to 200 nautical miles when the United Nations Convention on the Law of the Sea came into effect in 1994. Nations' rights and responsibilities to govern their EEZs are therefore a relatively new phenomenon. Technological advances have allowed for increased use of EEZ resources so the need to improve their governance has become more than a theoretical exercise. To address these shortcomings, the New Zealand government is proposing legislation to improve the management regime in the EEZ to regulate environmental impacts and address cumulative effects.

Traditional regulatory approaches to addressing cumulative effects have been in use for decades in many countries around the world, including the United States and New Zealand. These efforts have had mixed success because cumulative effects assessments are challenging to perform. The EEZ's vast scale and the relative lack of data and knowledge make this approach difficult. Existing models must therefore be approached with some caution.

Even though countries now hold sovereign rights in the EEZ, the zone remains a commons, i.e. a property with open access. Governance of commons comes with a unique set of challenges. Considering the size, dynamic nature, and unpredictability of the EEZ, it is particularly difficult to design a governance regime. There are three mechanisms generally used for overcoming the challenges of governing the commons: the government mechanism, the market mechanism, and co-management, which entails the government and the community managing the resources together in some way.

## Government Mechanisms

Potential strategies of government mechanisms include improved coordination of government activities and area-based governance. To improve coordination, New Zealand could create a whole-of-government effort or give one government agency (i.e. an "overlord" ministry) authority over EEZ-related activities of other government agencies. This would improve integration of government activities, but would lack meaningful stakeholder involvement, not allow for tradeoffs between the different sectors, and could increase bureaucracy without concomitant benefits.

For area-based strategies, the government could undertake marine spatial planning or implement an ocean zoning regime without property interests. Marine spatial planning would be a proactive way of achieving a comprehensive view of uses and reducing conflicts, but would not allow for tradeoffs between sectors, and would have no legal force, which could undermine its effectiveness. Ocean zoning allows for a rational allocation of marine space into dominant use zones and multiple use zones. Ocean zoning has numerous advantages: it improves integration of activities, accounts for non-use values, enables tradeoffs, and includes a participatory process for

stakeholders. However, zoning does not address issues that defy spatial restraint (e.g. invasive species) and would have high implementation costs.

## Market Mechanisms

The most prevalent market-based strategy in the environmental arena is tradable environmental allowances. However, this is probably not a viable option for the EEZ because of the number of different types of resources subject to extraction. Another market-based strategy is ocean zoning with the assignment of property rights in the zones. Ocean zoning with property rights would not entail government alienation of the EEZ; it would entail the government granting individuals, sectors, or groups a long-term property right to zones in the oceans for them to develop, conserve, or sub-lease as they saw fit. All activities would still be subject to regulation. The advantages of this approach include adaptability, maximisation of economic value, and increased innovation. Disadvantages include failure to account for non-use values, lack of a comprehensive view of what New Zealand wants its EEZ to be used for, high initial implementation costs, and a potential abrogation of the government's trust responsibility in the EEZ.

## Co-management

Co-management is a sharing of responsibilities, rights and duties between the government and the stakeholders. It is a strategy that exists along a continuum from government simply seeking extensive community consultation to government ceding decision-making. The success of co-management is dependent on numerous factors such as moderate rates of change, strong community ties, and the ability to exclude outsiders at relatively low cost. Co-management has a number of advantages, including integrated management, a comprehensive view, reduction of conflicts, adaptability, and an inclusive process. Its drawbacks are that co-management regimes may avoid the tough decisions and influential leaders are a necessary component. While it is a potentially strong strategy, the lack of a local community means co-management is probably not a viable strategy for the EEZ.

## Conclusion

Governing a commons as large as New Zealand's EEZ is complicated but necessary. The strategies discussed in this report are not mutually exclusive, and a mix of them will probably be most effective in improving governance of the marine commons over the long-term. That said, it seems likely that EEZ governance in the future will need to have a strong spatial component, such as marine spatial planning or ocean zoning without property interests. A spatial component to governance does not obviate the need for regulation of activities, but it can help to allocate space in a rational way so all societal needs and values can be taken into account.

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# INTRODUCTION

It has become apparent around the world that national governance regimes for marine resources are inadequate to protect biodiversity or to thoughtfully decide between conflicting uses – a quintessential example of struggling to govern the commons.[1] As uses of marine resources and ocean space continue to increase, the need to improve (and possibly overhaul) governance regimes has become more pressing.[2] This need for improved governance includes nations' Exclusive Economic Zones (EEZ), which extend from 12 to 200 nautical miles offshore. Countries' control over EEZ resources is relatively new, and most are just now starting to grapple with their governance rights and responsibilities over these often enormous areas of the sea. Policy-makers have recognised that current laws and regulatory schemes are insufficient to address many of the current and emerging uses because the existing laws (passed decades ago) did not anticipate the EEZ's geographic scope or the technologies that have now enabled further activity on the EEZ, such as offshore aquaculture, deep seabed mining, and energy generation.

To proactively address its shortcomings in EEZ management, the New Zealand government is currently working to improve regulation of the natural resources of the EEZ through new legislation. The New Zealand Ministry for the Environment has been charged with advancing this work to achieve two broad goals: filling regulatory gaps to address environmental effects, and addressing cumulative impacts. Proposed legislation is being prepared to accomplish these goals. This report will investigate the traditional regulatory approach to addressing cumulative impacts and then will identify and analyse future potential strategies that could enable a more comprehensive and integrated approach to EEZ governance.

The future management regime will need to take into account the impacts of all the various sectors. In other words, management must become more integrated. This is difficult because the various sectors are managed by diverse government agencies, each of which operates under different laws. This traditional sectoral approach can be an impediment to integrated management but strategies do exist to overcome the piecemeal approach.

The nature and characteristics of the ocean commons must be understood before potential governance strategies can be identified because these characteristics will affect the effectiveness of governance regimes.

The first chapter of this report provides a brief history of the emergence of EEZs, followed by an overview of the current state of oceans governance in the United States and New Zealand. They share many of the same challenges and have similar management regimes. The history and background of New Zealand's efforts to improve management of the EEZ is outlined, and the general challenges and shortcomings of the traditional regulatory approach to assessing cumulative effects on the environment are discussed.

[1] Governance in this context is the institutions, rules, and agreements (formal or informal) that a group of people use to govern themselves. Governance can, but does not have to, include government.
[2] See e.g., Costanza (1998)

Chapter two addresses the unique governance issues of the commons. The characteristics and nature of marine commons are identified, and how those characteristics make governance especially challenging is explained. This chapter then identifies ways in which commons governance can be facilitated to overcome those challenges. Governance strategies can be analysed based on which sector is the primary driver of the governance: the government, the private market, or shared governance between government and stakeholders, usually referred to as co-management.

Chapter three investigates the traditional regulatory approach to assessing cumulative effects in the EEZ, and discusses the challenges, advantages and disadvantages of this approach. The chapter then identifies other potential governance strategies that New Zealand may wish to consider in the future to improve governance of the EEZ. Potential strategies are offered and analysed pursuant to which of the three governance mechanisms identified in Chapter two would be the primary driver of the strategy.

# 1 EEZ GOVERNANCE IN NEW ZEALAND AND UNITED STATES

Governance and policy are never static but a continuum of change. Future modifications and transformations are determined by what has been decided in the past. In the 1980s governance of the oceans experienced a literal and figurative sea change, with the creation of Exclusive Economic Zones (EEZ) through the United Nations Convention on the Law of the Sea III (UNCLOS III). Coastal nations around the world continue to grapple with the ramifications of this treaty.

To understand the current issues surrounding EEZ governance, we must first understand the changes brought about by UNCLOS III. This section also explores recent efforts in the United States and New Zealand to improve ocean governance, particiularly the New Zealand decision to fill gaps in the regulatory regime of the EEZ through regulating environmental effects of activities and addressing cumulative effects. This section concludes with a general discussion about the traditional regulatory approach to addressing cumulative effects, and the governance issues that strategy will and will not address.

## A Very Brief History of Exclusive Economic Zones

As early as the second century, Marcianus, a Roman jurist, declared that the sea was common to all.[3] This principle controlled oceans governance for centuries until the growth of trade resulted in conflicting claims between nation states over the sea and its resources in the 16th and early 17th centuries. This led to a debate between the contradictory philosophies of “freedom of the seas” (*mare liberum*) and “closed seas” (*mare clausum*).[4] The principle of “freedom of the seas” won out, and a relatively narrow band of three nautical miles was recognised as a nation’s territorial waters.[5] The rest of the oceans were considered "high seas", not subject to any nation’s control. This three mile demarcation prevailed until the mid-20th century.

In 1945 United States President Truman issued the “Truman Proclamations” that unilaterally declared that the US asserted “jurisdiction and control” over the continental shelf contiguous to the US, to develop the petroleum and other minerals off its coasts. The US also wanted to “protect coastal fishery resources from destructive exploitation.”[6] Most coastal nations soon asserted their own unilateral

[3] Galdorisi (1997), p. 7-8. Marcianus wrote: ‘The following things are by the Law of Nature common to all: the air, running water, the sea, and consequently the seashore.’ Reeves (1917), at p.535, quoting Digest XIV.ii. I, 9 (Monro’s translation).

[4] Hugo Grotius, a Dutch jurist, relying on Roman and natural law, advocated for *mare liberum* to dispute Spain and Portugal’s attempt to divide the world oceans between themselves. Grotius’ work is often seen as the beginning of modern international law. Reeves (1917), p. 536. John Selden, an English lawyer, wrote a contrary argument to Grotius advocating for *mare causum*, a nation’s right to appropriate parts of the sea. One of Selden’s arguments was that the depletion of Britain’s fishery stocks off its shores justified the exclusion of foreign fishing fleets. Galdorisi (1997), p.10. See also, Ziskind (1973).

[5] Galdorisi (1997), p. 10. The three mile limit was derived from how far a cannon ball could fly in the early 18th century.

[6] Presidential Proclamation 2667 of September 28, 1945. The proclamation regarding mineral resources recognised that with “modern technological progress their utilization is already practicable or will become so at an early date . . .” There are distinct differences between the two proclamations: the one

claims to ocean resources.[7] The centuries-old customary law of a three mile jurisdictional seaward limit had imploded, and "freedom of the seas" was in retreat.

Maritime nations, including the United States, became concerned that these new extensive claims to national jurisdictions could interfere with rights of navigation or overflight.[8] These tensions led to the convening of the First United Nations Conference on the Law of the Sea (UNCLOS I), which resulted in consensus on many issues but left undecided other issues such as the width of the territorial sea.[9] UNCLOS II convened in 1960 but produced no significant progress on critical issues regarding jurisdictional limits.

In 1967, Arvid Pardo, Malta's Ambassador to the United Nations, gave a speech to the UN General Assembly in which he declared that the seabed and ocean floor should be a "common heritage of mankind", not subject to national appropriation.[10] This speech instigated negotiations in the early 1970s that led to the convening of UNCLOS III. After approximately a decade of negotiations, the United Nations approved the treaty in April 1982. The United States was one of four countries to vote against the treaty.[11] It came into effect in 1994, one year after the sixtieth country ratified it.[12] As the time of writing, 155 countries have ratified the treaty.[13] The United States has not.[14] In 1983, via an executive order, President Reagan did proclaim an EEZ for the United States of 200 nautical miles in accordance with international law.[15]

UNCLOS III is often called the constitution for the oceans because it designates the rights and duties that nations have regarding use of the oceans. It provides for the rights to navigation and to lay submarine cables, sets a 12-nautical mile limit for territorial seas, establishes a regime for deep sea mining, promotes marine conservation, provides for scientific research and creates exclusive economic zones (EEZs) of 200 nautical miles.[16] Part V of the treaty contains the provisions concerning

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concerning mineral resources claimed the resources as a property right; the fishery proclamation merely claimed an exclusive right to conservation authority. McDormand (2005), p. 17.

[7] US Commission on Ocean Policy (2004), Appendix 6, p. 4

[8] Galdorisi (1997), p. 23

[9] Ibid. UNCLOS I did result in agreement on four conventions: the Convention on the Territorial Sea and the Contiguous Zone, the Convention of the High Seas, the Convention on the Continental Shelf, and the Convention on Fishing and Conservation of Living Resources of the High Seas.

[10] Galdorisi (1997), p. 25. Pardo was not the first to express this sentiment. A year earlier, US President Lyndon B. Johnson stated that "We must ensure that the deep seas and the ocean bottom are, and remain, the legacy of all human beings."

[11] Galdorisi (1997), p. 51. The US refused to vote for the treaty primarily because of the provisions regarding deep seabed mining in Part XI of the treaty. NZ signed the treaty on 10 December 1982, the day it opened for signature, and ratified the treaty on 19 July 1996.

[12] Guyana, the sixtieth country to do so, ratified the treaty on 16 November 1993.

[13] http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm

[14] Galdorisi (1997), p. 73. The US signed the treaty in 1994 after its primary concerns regarding the deep seabed mining provisions were addressed through amendments to Part XI. Even though the US has not yet ratified the treaty it has acted in a manner consistent with the provisions related to traditional uses, such as navigation and overflight. In May 2007 President George W Bush urged the Senate to accede to the treaty. In October 2007 the Senate Foreign Relations Committee approved the convention by a vote of 17-4, thereby sending it to the full Senate for consideration.

[15] Presidential Proclamation 5030 of 10 March 1983. 'The Exclusive Zone of the United States of America', 48 Fed. Reg. 10605 (14 March 1983).

[16] UNCLOS III, Article 57

the EEZ, providing for "rights, jurisdiction and duties of the coastal state". The treaty grants "sovereign rights" for the purpose of exploring, developing and conserving living and non-living natural resources of the waters, seabed and subsoil.[17] The treaty also provides for the rights and duties of other states, including the right of innocent passage, overflight, and the laying of submarine cables.[18] Conservation provisions provide for the coastal states to take management measures to ensure living resources are not endangered by over-exploitation.[19]

In light of this history a couple of points for consideration emerge. First, technological advances have made the question of how to wisely govern the oceans more than a mere theoretical exercise. The human race has a voracious appetite for resources, both living and nonliving. Our technical capability to extract those resources has progressed a great deal over the last few decades: the depth and scale of fish and petroleum extraction has increased enormously. Technology for new and current uses continues to develop: aquaculture is growing quickly, and seabed mining and offshore renewable energy are also increasing. In addition there has also been recognition that more must be done to conserve ocean resources. The technological ability to extract more renewable and nonrenewable resources from the sea will only grow, which means that ocean governance will become more difficult over time as stakeholders will have interests in the resources.

Second, national management of vast areas of the ocean is still a relatively new concept. It has been less than 30 years since nations were granted the rights and responsibilities to manage natural resources out to 200 nautical miles.[20] This is an enormous change, and nations are still finding their way on the most appropriate way to exercise their rights and fulfil their obligations.

Many coastal states, including the United States and New Zealand, are currently working to improve the governance of their EEZs. Many questions have arisen. How do we balance the need for resources and the duty to conserve? How do we allow for new uses and still protect the environment? How should we choose between competing uses? Should current users be compensated for adverse impacts created by new beneficial uses? How do we integrate management of the different uses even though they are regulated by different government agencies? How should we move forward knowing we have enormous gaps in our information and knowledge about ocean resources?

[17] UNCLOS III, Article 56. Sovereign rights are something less than sovereignty. See Leich (1983), p. 623

[18] UNCLOS III, Article 58. The other state must comply with the laws and regulations adopted by the coastal state with control over the EEZ as long as those law and regulations are not incompatible with the treaty.

[19] UNCLOS III, Article 61

[20] Some countries, including NZ, have filed claims with the UN Commission on the Outer Limits of the Continental Shelf for sovereign rights over the seabed of their continental shelfs outside 200 nautical miles. In 2006 NZ filed a submission in to claim an additional 1.7 million km² of seabed. In April 2008 the Commission granted Australia an additional 2.5 million km² of continental shelf, raising the hopes for a favorable ruling on New Zealand's submission.

## Similarities between United States and New Zealand

The United States and New Zealand are each responsible for managing two of the largest EEZs in the world: the United States' EEZ is 11.3 million km² and New Zealand's 4.3 million km², the largest and fifth largest respectively.[21] These marine tracts support millions of jobs and provide each nation with renewable and nonrenewable resources.[22] For both, marine resources provide significant economic benefit, enhance the quality of life, and are part of their cultural heritage. The ocean carries the cargo, produces the fish, sustains biodiversity, supports tourism, provides energy, and is the focus for cultural and other non-use values.[23] Over half of Americans live within the coastal zone, and all New Zealanders live within 130 kilometres of the coast.[24] The ocean is clearly important to both countries.

The countries also share similar governance structures for their marine environments, including many of the same weaknesses. Their EEZs are a mosaic of laws and regulations, containing regulatory gaps and lacking cohesion.[25] Governance is fractured where the various sectors are regulated and managed independently of each other. In the United States 19 different federal agencies are involved in the management of marine resources.[26] In New Zealand 13 separate government departments or ministries have responsibility for management of some aspect of the marine environment.[27] This means that fisheries are regulated by one agency, energy development by another, shipping by another, and conservation by yet another. This results in a lack of a comprehensive vision and an overall purpose or planning for governance of the EEZs.

Government-mandated commissions in both countries have clearly identified the challenges facing their respective countries. In 2004 the US Commission on Ocean Policy issued *An Ocean Blueprint for the 21st Century*, a massive report that reviews the state of ocean governance in the United States.[28] The report is an indictment of the status quo and issues over 200 recommendations for change. The key recommendations are improved national coordination (especially in offshore waters), an enhanced regional approach, a strengthened federal agency structure, and increased investments in ocean science.[29] Specific to federal waters (including the EEZ), the report recognised that while the number of activities taking place is growing, unacceptable gaps in the regulatory structure remain.[30] The report states that an

[21] US Commission on Ocean Policy (2004), Front Matter. The US' EEZ is 23% larger than its land mass. Pew Oceans Commission (2003), p. 5. New Zealand's EEZ is 15 times the size of its land mass. *Improving Regulation of Environmental Effects in New Zealand's Exclusive Economic Zone* (2007), p. 1

[22] US Commission on Ocean Policy(2004), Appendix C

[23] Non-use values include conservation, biodiversity protection, cultural, spiritual, aesthetic and existence values.

[24] Even though half of the people in the US live in the coastal zone, it is only 17% of the land area.

[25] Crowder (2006), p. 617

[26] US Commission on Ocean Policy (2004), p.5. This number does count the agencies of the 35 coastal states and territories in the United States which generally have jurisdiction out to three nautical miles.

[27] *Setting the Course* (1999), p. 109

[28] Op cit. At roughly the same time that the US Commission was developing its report, the Pew Oceans Commission, an independent body, was drafting a similar report. The Pew Oceans Commission issued their report, *America's Living Oceans: Charting a Course for Sea Change*, in 2003.

[29] US Commission on Ocean Policy (2004), pp 5-11. See also, Cicin-Sain (2000), p. 4

[30] Ibid. p.98

improved regulatory structure should provide for "robust coordination for all ocean activities."[31] The Commission also recommended that the governance regime should prioritise activities, minimise conflicts, and protect resources.[32]

In New Zealand the Parliamentary Commissioner for the Environment issued *Setting the Course for a Sustainable Future: The Management of New Zealand's Marine Environment*. The report notes that New Zealand's governance regime for the marine environment lacked cohesiveness[33] and recognises that this governance suffered from compartmentalisation, i.e. the various activities were administered under different laws and separate management regimes.[34] It is stated that this failure of integration is a "major strategic risk" for the sustainability of New Zealand's marine environment.[35] The report goes on to recognise that large information gaps exist in the knowledge of marine systems.[36]

As shown by these summaries, the weaknesses of marine governance of the United States and New Zealand are very similar. Both suffer from fractured, sector-by-sector management. Both countries fail to integrate management across sectors or take a comprehensive view of the various activities in the EEZ. While having numerous laws applicable to the EEZ, both still have significant regulatory gaps in the administration of uses. Both countries share (along with the rest of the world) the problem of lack of knowledge and scientific information about marine systems. Fortunately, both countries are working to address some of their weaknesses.

## New Zealand's efforts to improve EEZ governance

After the release of *Setting the Course*, New Zealand's Ministry for the Environment was charged with developing an Oceans Policy. In March 2001, as Stage One in the development of an Oceans Policy, Cabinet appointed a Ministerial Advisory Committee to undertake a public consultation to "define a collective vision[37] and identify the values New Zealanders believe should inform decision-making about the oceans in our jurisdiction."[38] During the consultation, New Zealanders said they wanted an oceans policy that would integrate management processes, provide for open and transparent decision-making, find an equitable balance between competing aspirations, provide for economic development without compromising environmental quality, ensure management decisions are informed, and promote collective responsibility.[39]

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[31] US Commission on Ocean Policy (2004), p. 99
[32] Ibid.
[33] *Setting the Course* (1999), p. 2
[34] Ibid. p. 45
[35] Ibid. p. 46
[36] Ibid. p. 75
[37] The vision identified through the public consultation process was: "New Zealanders understand marine life and marine processes and, accordingly take responsibility for wisely managing the health of the ocean and its contribution to the present and future social, cultural, environmental and economic well being of New Zealand." This vision statement was later shortened by Cabinet to: "Healthy Oceans: wisely managed for the greatest benefit of all New Zealanders, now and in the future." http://www.mfe.govt.nz/issues/oceans/previous-work/stage-one.html (Retrieved 27 March 2008).
[38] Oceans Policy Secretariat (2001), p. 3
[39] Ibid. p. 8

Stage Two of Oceans Policy development focused on drafting working papers, performing stocktakes and developing policies that would achieve the vision identified in Stage One.[40] Work conducted as part of Stage Two included working papers on information issues, ocean use rights, public participation, adapting to future changes, and encouraging new opportunities. After Stage Two, the Ministry for the Environment concluded that the current governance structure was "lack[ing] integration between legislation, policy, decision-making, and activities in the marine environment."[41]

In June 2003 while the oceans policy was in the process of being developed, the New Zealand Court of Appeal issued the Ngati Apa decision regarding the foreshore and seabed.[42] In this case the court found that Maori could assert claims of customary title to the foreshore and seabed. Consequently, the Maori Land Court had jurisdiction to investigate Maori claims to these areas.[43]

The government was concerned that the Ngati Apa decision could result in subsequent court decisions that would result in the public not having access in and along the foreshore and seabed. The government introduced legislation that clarified that ownership of the public foreshore and seabed (out to 12 nautical miles) was vested in the Crown, recognised Maori and non-Maori (territorial and non-territorial) customary rights, and set up a process for the legal recognition and protection of Maori and non-Maori customary rights in the public foreshore and seabed.[44] The Act also created legal rights of access and navigation. The legislation passed as the Foreshore and Seabed Act 2004. The Resource Management (Foreshore and Seabed) Amendment Act was also passed in 2004 to integrate these largely Maori rights into the framework of the Resource Management Act 1991. During this time the work on developing an Oceans Policy was effectively put on hold.

In June 2005 the Ministry for the Environment published *Offshore Options: Managing Environmental Effects in New Zealand's Exclusive Economic Zone* as a 'think piece' to stimulate debate, discussion and analysis. This document reviewed the current legislation, identified the regulatory gaps, looked at international examples for EEZ management, and outlined some potential options for improving environmental management of the EEZ.[45] As for the work on the Oceans Policy, the government decided in 2006 to pursue the highest priority issue identified so far: improving the regulatory regime to address environmental impacts in the EEZ.

In August 2007 the Ministry for the Environment released a discussion paper for consultation, *Improving Regulation of Environmental Effects in New Zealand's Exclusive Economic Zone.*[46] The discussion paper proposed "establishing new legislation to fill key gaps in EEZ environmental regulation and promote a consistent

[40] See e.g., Enfocus Ltd (2002) and Enfocus Ltd (2003)
[41] Oceans Policy Secretariat (2003), p.1
[42] Attorney General v. Ngati Apa [2003] 3 NZLR 643 (CA)
[43] Ibid.
[44] http://www.justice.govt.nz/foreshore/background.html (Retrieved 3 April 2008)
[45] *Offshore Options* (2005)
[46] In December 2007 the Ministry for the Environment released a document that provided a summary of the submissions received on the discussion paper: *Summary of Submissions on Improving Regulation of Environmental Effects in New Zealand's Exclusive Economic Zone.*

approach to environmental management across different statutes."[47] The paper identified two broad options for moving forward: 1) legislation to fill the key gaps or 2) develop a new regime to manage all activities.[48] The government's preferred option was to fill the key gaps, which included a consideration of cumulative effects across activities.[49]

## Cumulative Effects and Governance Structure

A regulatory approach to addressing cumulative effects has been in use for decades in many countries around the world. The need to address cumulative effects arises from the fact that environmental impacts are often the result of numerous projects or activities which can impact the environment in additive or interactive ways.[50] To use a simplified example, a few houses in a watershed will likely not impact water quality downstream; a million houses probably will. One activity by itself is not necessarily a concern but numerous activities collectively can cause environmental problems. This is often described colloquially as "death by a thousand cuts." Cumulative effects assessments (CEAs) attempt to address this problem pursuant to a regulatory regime. CEAs are usually undertaken to assess a project, a group of projects, or a policy change. This section will review definitions of cumulative effects to determine the common elements of the traditional regulatory approach to assessing them.

There is no single, agreed definition of cumulative effects or cumulative impacts. In the United States, the National Environmental Policy Act (NEPA)[51] regulations define cumulative effects as:

> the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other action.[52]

In Canada, the *Cumulative Effects Assessment Practitioners Guide* defines it as:

> changes to the environment that are caused by an action in combination with other past, present and future human actions.[53]

In New Zealand, a "cumulative effect" is not specifically defined in the Resource Management Act but the definition of "effect" does include:

> *(d)* Any cumulative effect which arises over time or in combination with other effects—regardless of the scale, intensity, duration, or frequency of the effect.[54]

[47] *Summary of Submissions* (2007), p. vii
[48] Ibid. p. 10
[49] Ibid. p. 10-11
[50] The terms "effects" and "impacts" are used interchangeably in this report.
[51] NEPA, 42 U.S.C. §§ 4321 *et seq.*
[52] 40 C.F.R. §1508.7
[53] Hegmann, Section 2.1
[54] Resource Management Act 1991, Part 1, Section 3. See also, Milne(2008)

These definitions share key characteristics concerning the temporal scale, the spatial scale, and the synergistic effect of activities. They also share an absence of any limitation on the type of activity or impact.

**Temporal Scale**: All have a broad temporal reach, including past, present and future actions. It is not enough to simply look at a proposed activity's impact, an assessor must look at what impacts have already occurred and what activities may occur in the future. This raises the issue of what is the appropriate baseline for the "past" and how the forecast for the "future" should be conducted. If all past impacts are to be considered does this mean that the baseline is a pristine natural state before humans arrived? Assuming some level of impact is acceptable then what becomes unacceptable? As to future activities, how are regulators supposed to forecast what is going to happen? Do they look out 10 years? 20? 100? These questions are beyond the scope of this paper. For the purposes of this report, it is important to be aware of the complexity of assessing cumulative impacts.

**Spatial Scale**: The definitions include a broad spatial scale—the "environment"—which is not limited by the spatial reach of only the proposed activity. While a broad definition is wise policy, it can be difficult to implement in practice. To be workable, a spatial scale needs to be defined.

**Synergistic Effects**: It is recognised that impacts will combine to impact the environment and that these impacts are usually nonlinear.[55] When multiple activities affect the same environment, it is not simply a matter of adding Impact A + Impact B + Impact C because various impacts may have a multiplying effect. In practice, however, considerations of cross-sectoral impacts are rare.[56]

**Absence of Limitation on Activity Type**: None of the definitions limit the consideration of the effects to "similar effects." The NEPA definition explicitly states that all foreseeable actions must be considered regardless of who is acting. It is not a sector-by-sector analysis. The regulator is supposed to take into account all activities, regardless of whether they have any responsibility for regulating the activity.

These characteristics presuppose that the decision-maker understands which resources are where, and is aware of all uses. Ideally, a governance regime would include a determination of what level of impact is acceptable, a forecast of future activities, the ability to analyse and address cross-sector impacts, a delineation of a spatial scale that is more manageable than "the environment". the collection and analysis of data to understand the synergistic impacts of activities, the ability to adapt easily so new proposed future activities could be taken into account, and the collected information incorporated into future analyses.

If a traditional cumulative effects regulatory regime managed to accomplish all of the above, would it be enough to ensure that all of a society's goals will be met? There are two outstanding elements: 1) cumulative effects analyses do not allow for tradeoffs, and 2) they do not adequately account for non-use values. Cumulative effects assessments are primarily analyses of current, proposed or reasonably

[55] Halpern (2007), p. 2 and p. 4. *See also* Liu, p. 1514
[56] Halpern (2007), p. 2

foreseeable activities or uses. They lack the ability to determine which activity is superior to another or to decide when one use should be supplanted by another. They do not allow for tradeoffs between uses.[57] Non-use values, such as protection of biodiversity, existence values, cultural values, and aesthetics, can also be overlooked.[58] Under traditional cumulative effect assessments, the question is usually "should this particular proposed use be allowed?" where the more appropriate question may be "taking all societal goals into account, which use or non-use is best for this place?"

Under current sector-by-sector governance structures for the oceans in both the United States and New Zealand tradeoffs between sectors are not part of the structure, forecasting of future growth across sectors and then applying it to current decisions is uncommon, synergistic impacts are not well understood, and government agencies are not known for being easily adaptable. What other strategies exist to improve governance of an EEZ?

To begin to address this we must first acknowledge that the oceans are the largest commons on the planet. They do not belong to any one nation. The EEZs of the world are not "owned" by the coastal nations; they are merely granted "sovereign rights" to this area.[59] Even territorial seas, although part of the national jurisdictions of the US and NZ, are commons because the sovereign holds them in trust for the people of the nation. The next chapter will discuss the challenges this presents and identify the various mechanisms for commons governance in the context of the EEZ.

[57] Halpern (2007), p. 6
[58] Hanna (1996), p. 43
[59] UNCLOS III, Article 56

# 2 CHALLENGES TO GOVERNING THE EEZ COMMONS

Commons, or "common pool resources"[60] (CPRs) present two challenges: the difficulty of exclusion and the subtractability problem.[61] Exclusion means "the ability to exclude people other than the members of a defined group."[62] CPRs are subject to easy access by numerous people, which can lead to over-exploitation of the resource. Subtractability means each user can subtract resources from the welfare of other users.[63] If one user takes the resource from the system then the resource will not be available for extraction by another user. For example, if a person catches and keeps a fish that fish will not be available for extraction by anyone else, i.e. the fish is "subtracted" from the resource system permanently. The key of commons governance, therefore, is to limit access to the resources (i.e. overcome the exclusion problem) and regulate the users at sustainable levels (i.e. overcome the subtractability problem).[64]

For successful governance of a CPR that is subject to overexploitation, access to the resource must be limited. If a CPR is not subject to over-exploitation and the extraction of the resource does not adversely affect the ecosystem then there is little need for formal governance institutions. It may be possible to develop collective rules to govern CPRs but if non-members can gain access to the resources then there is a risk of overextraction. Even if non-members are excluded, outside stresses such as population growth or technology changes can break down existing rules of exclusion.[65] If non-members are excluded but users still overexploit the resources then long-term sustainability will not be achieved. To solve CPR problems, therefore, the governance institutions must both restrict access to sustainable levels and create incentives for users to invest in the long-term health of the resource.[66] This can be accomplished through different governance mechanisms: by government, by markets, or by co-management.

## Early Commons Literature

In 1968 Garrett Hardin wrote a seminal paper, "Tragedy of the Commons", which discussed the challenges of managing the commons.[67] The example that Hardin uses in his article is of a pasture that is open to all for cattle grazing. Hardin argues that each herdsman will seek to maximise his gain in the pasture thereby leading inexorably to the over-exploitation of the pasture. Each herdsman receives all of the benefits (i.e. profits) from the sale of his cattle, but incurs a small fraction of the cost (degradation of the pasture).[68] Added to this is the fact that if a herdsman refrains from putting more cattle on the pasture, other herdsmen will add cattle so his forebearance results in no benefit to him. Hardin argues that each rational herdsman will conclude that "the only sensible course for him to pursue is to add another animal to his herd. And another, and another, and another. But this is the conclusion reached

[60] The terms "commons" and "CPR" are used interchangeably in this report.
[61] Ostrom (1999), p. 278
[62] Berkes (2006), p. 47
[63] Ibid. p. 46
[64] Berkes (2006), p. 47
[65] Ibid.
[66] Ostrom (1999), p. 279.
[67] Hardin (1968)
[68] Hardin (1968), p. 1244.

by each and every rational herdsman sharing the commons." Hardin concludes that "freedom in the commons brings ruin to all."[69]

Hardin reasoned that the incentives for individuals to use common property worked in such a way that would lead to degradation of the commons.[70] The incentives for each individual did not align with the collective good. Hardin offered two ways to deal with this tragedy: government action to regulate the use of the commons, or privatisation of the commons so individuals would have an incentive to conserve.[71]

Since Hardin published his article, however, it has been proved that sustainable commons governance can be achieved in ways that neither required government control of the commons nor privatisation of the resource. In *Governing the Commons* Elinor Ostrom shows that numerous examples exist of communities managing common resources for the benefit of the community based on rules of the community's devising.[72] In fact, many solutions exist to address many different problems.[73] Ostrom's book, however, is of limited reach. It focuses on analyses of small-scale CPRs with a limited number of individuals who are dependent on the resource for their economic well-being.[74] Her examples are primarily concerned with only one or two resources at a time, and not with the ecological system as a whole.

Given the fact that the early commons research was based on local community commons, it remains an open question to what degree the lessons learned in those local fora can be scaled up to much larger resources and more complex social systems.[75] It is apparent that larger commons have additional issues to address, such as having a larger number of participants, increased heterogeneity, the inherent complications of multiple and linked CPRs, and tiered governance structures.[76]

## Complexities of Governing the Commons

As discussed above, much of the early academic work on the governance institutions of common pool resources was limited to the context of a single community managing a single resource, such as a fishery, or a forest, or water.[77] Due to the limited scale of the analyses, two significant considerations remain: the complexity of the biophysical environment (the ecological system) and the complexity of the social, economic and political setting (the social system).[78]

The ecosystem is not one resource but many resources combined in a complex interacting system. As for the social setting, a community of people and their interrelationships are rarely simple.[79] Individuals may have different interests, world views, priorities, and histories. In any given instance, there may or may not be

[69] Ibid. p. 1244
[70] Ibid. p. 1244
[71] Ibid. p. 1244
[72] Ostrom (1990). Ostrom acknowledges that her analysis is limited to small-scale CPRs.
[73] Ibid. p. 14
[74] Ibid. p. 25
[75] Berkes (2006), p. 45
[76] Ostrom (1999), p. 281-282
[77] Paavola (2007), p. 94
[78] Agrawal (2001), p. 1655
[79] Berkes (2006), p. 48

effective leaders, community ties, and good relationships. Also, local communities do not manage CPRs in a vacuum; there are often broader forces at work, such as global market pressures, national political changes, or technological innovation. This broader social, political and institutional setting is the "social system", which includes property rights, systems of knowledge, the political context, and ethics.[80] Not only are both ecological and social systems complex in and of themselves, these two systems are inextricably linked. Social systems (people) and ecological systems (nature) cannot be thought of as two separate systems but must be governed as a single social-ecological system.[81]

Matching the scales of governance to a social-ecological system can be a complex undertaking.[82] This is often described as "the problem of fit"[83], and it is one of the persistent challenges to managing social-ecological systems.[84] Ideally, the governance structure of a social-ecological system should match the scale of the ecosystem while accounting for social scales.[85] With a large CPR, such as the oceans, governance institutions will have to operate at different levels. There will not be one scale of governance but many, all interlocking and linked.[86] These different scale levels have to be integrated with each other so there is cohesion to the whole.[87] The complexity grows exponentially when trying to integrate across communities or aggregate multiple communities up into higher scales of governance. Integrating multiple scales of social-ecological governance is not easy. Larger CPRs, therefore, are usually more difficult to govern.

## Characteristics of the EEZ that Affect Governance

Scholars have identified a number of characteristics of the common pool resource and its context that affect the design of the governance regimes.[88] This section will discuss the relevant characteristics of the EEZ resource system and how they may affect governance.

The ecological system characteristics that affect the design of a governance regime include:

- Size of the resource system (i.e. ecoregion)
- Existence of well-defined boundaries
- Levels of mobility of the resource system
- Possibilities of storage in the system
- Predictability[89]

[80] Berkes (1998), p. 2
[81] Ibid.
[82] See, Agrawal (2001) and Ostrom (2007), which identify dozens of variables relevant to analysing a social-ecological system.
[83] Galaz (2006), p. 1
[84] Cash (2006), p. 11
[85] Galaz (2006), p.1
[86] Berkes (2006), p. 48. See also, Armitage (2008), pp. 14-15
[87] Berkes (2006), p. 48
[88] Agrawal (2001), p. 1654 and p. 1659. In addition to resource system characteristics, other relevant characteristics include group characteristics, institutional arrangements, the relationship between the group, institutions and the resource systems, and external drivers.
[89] Agrawal (2001), p. 1659

Applying these characteristics to the EEZ reveals the difficulty of managing a common pool resource as vast and dynamic as the ocean.

***Size of the resource system***. Generally, smaller resource systems are easier to manage than large systems.[90] Smaller systems usually mean a smaller pool of stakeholders and fewer levels of governance. Larger systems tend to greater complexity in governance regimes. Smaller resource systems make exclusion more manageable. The EEZ is obviously a vast resource, which does not lend itself to simple governance regimes.

***Existence of well-defined boundaries***. Twenty years ago this would have been a significant if not insurmountable hurdle in the EEZ, but with the advent of LIDAR, satellite observations, GPS, and other high-tech tools, defining clear boundaries for management purposes in the open ocean is now practicable.

***Level of mobility of the resources***. High levels of mobility are more difficult to govern due to "information complexity and cost, and the difficulty of capturing the benefits of individual or collective action."[91] With mobile resource flows, it is difficult to determine the cause of a flow decline, which means it is also difficult to determine how to address the decline.[92] Early commons literature tended to analyse "one resource" governance regimes so that a resource is deemed to be either mobile or not mobile. But in the case of the EEZ there are multiple resources: renewable and nonrenewable, mobile and stationary. Combine the highly mobile resources of many fisheries with the non-mobile resources such as seabed mineral deposits or a defined ocean space, and the level of complexity in the EEZ only grows.

***Possibilities of storage in the system***. Storage capacity allows users to capture and store resource flow units.[93] Storage can provide some buffers to the vagaries of resource flows, and it can make users more willing to delay appropriation of the resource, which can reduce conflicts among users.[94] An example of this would be a water appropriator storing water in a reservoir to draw on when water flows are low. This characteristic seems to be applicable only to renewable resources, and storage of renewable resources in the EEZ context is not possible.[95]

***Predictability***: While nearly every resource system is complex and completely predictability, more predictable systems are easier to govern because management actions are more likely to result in a discernible outcome.[96] The EEZ environment is extremely difficult to study because of its vast three dimensional space, its inaccessibility, the variety of habitats, creatures, and complex food webs, just to name a few.[97] Difficulty of prediction means moving governance forward is

[90] See e.g. Ostrom (2007), p. 15184
[91] Schlager (1994), p. 297
[92] Ibid.
[93] Ibid. p. 299
[94] Ibid. p. 300
[95] Aquaculture should not be considered storage in this context because aquacultured fish are not flows from the resource system but a cultivated product that is subject to appropriation only by the owner of the pen.
[96] Agrawal (2001), p. 1655
[97] Hixon (2001), p. 2

often controversial because stakeholders disagree about what management action is "best", and there is no guarantee of success.

According to these characteristics, it is clear that designing governance regimes for the EEZ is a particularly difficult case. The regime will need to account for massive scale, mobile and immobile resources, and a high level of uncertainty. This in addition to the general complexity of governing a commons. However, sustainable governance of the commons is achievable, and different mechanisms exist to address the challenges.

## Governance Mechanisms

Three general mechanisms exist to govern the commons: the government, the market, and co-management, the last being a continuum from near total local user control to government management that is heavily reliant on stakeholders.[98] The term "mechanism" is deliberately used instead of the phrase "property rights regime." Much of the commons literature describes four different types of property rights systems that have evolved or been designed to manage common pool resources.[99] Property rights are often described as a bundle of rights, which can include access, withdrawal, management, exclusion, and alienation.[100] While property rights are a necessary component of governance regimes, couching them in a property rights typology is limiting because governance entails more than the assignment of property rights.

Governance includes regulation of property holders, monitoring, enforcement, conflict resolution and decision-making processes.[101] While property holders may choose how to accomplish these governance tasks they need not be linked to a property interest. Because governance is about more than property rights and responsibilities, the three broad categories of governance mechanisms provide a more appropriate typology.

While specific potential strategies for the EEZ via each of these mechanisms will be discussed in section three, a general overview of each of these mechanisms for CPRs follows. It should be noted that the three mechanisms are not strictly delineated categories; often one mechanism will entail elements of the other two. The categories, however, are helpful to determine the primary thrust of the governance regime.

### Government Mechanisms

One of the ways to address governance of CPRs is for the government to own and manage the resource and thereby can limit access and impede the incentives for over-exploitation. In other words, government can address the CPR problems of difficulty of exclusion and subtractability through regulation. Through "command and control", the government regulates issues of access to resources and withdrawal. ssues of

[98] Juda (2001), p.44. Juda identified "three key general mechanisms of governance: the marketplace, the government, and nongovernmental institutions and arrangements." This report uses the term co-management instead of nongovernmental because in the EEZ government is required to be involved as the holder of sovereign rights.
[99] Ostrom (1999), p. 279. The four are open access, group property, individual property, and government property.
[100] Grafton (2000), p. 512
[101] Paavola (2007), p. 99

complexity and coordination are overcome by having one party, i.e. the government, make the decisions.[102] Government can also take non-market values into account, which the market mechanisms fail to adequately address.[103] Another potential benefit of the government mechanism is the economies of scale in data gathering, information dissemination, management, and enforcement.[104]

In reality, of course, government on large scales usually involves multiple agencies that fail to coordinate sufficiently with each other. Government bureaucracies can be slow to react to ecological change.[105] Lastly, governments can promulgate rules that create perverse incentives to the on-the-ground users that result in detrimental unintended consequences.[106]

**Market Mechanisms**

The market can also be the primary mechanism for governing the commons by encouraging behaviour through market incentives rather than through the command and control approach of government.[107] Commons can create perverse incentives due to a conflict between an individual's interests and the collective interest. Market mechanisms attempt to overcome those perverse incentives by aligning both interests.[108]

The primary benefits of market mechanisms are the creation of incentives for innovation and the promotion of economic efficiency.[109] If well-designed and implemented, market mechanisms will spur innovation because an individual will retain some of the benefits from helping to advance the collective goal.[110] By using market mechanisms, efficiency is promoted because market forces and the right to sell will result in the resource rights ending up with the more productive user.[111]

Market mechanisms can however ignore non-marketable values, such as biodiversity or conservation.[112] Most of the examples of a successful market mechanism in the environmental arena are for only one type of resource at a time, e.g. a market for air pollution, a market for water pollution, a market for a commercial fish species. The viability of market mechanisms to govern the full panoply of resources within an ecosystem is open to debate.

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[102] Grafton (2000), p. 507
[103] Ibid.
[104] Ibid. p. 513
[105] Ibid. p. 508
[106] Ibid. p. 508. Grafton uses an example of a government-imposed fishing season to limit over-exploitation, which creates an incentive for the fishers to increase their fishing effort during the season to maintain their catch level.
[107] Stavins (1998), p.1
[108] Ibid. One of the better known examples of a market mechanism in the environmental arena is tradable permits for air pollution, often referred to as "cap and trade". The government sets an overall policy limit but users can sell allowances between themselves. If a user can reduce their air pollution then they directly benefit from that because they can sell the unused allowances on the market.
[109] Stavins (1998), p. 2
[110] Mansfield (2004), p. 313
[111] Schlager (1992), p. 256
[112] Hanna (1996), p. 43.

**Co-Management**

There is strong academic support for co-management, a concept that acknowledges the links between social and ecological systems. Co-management is a "sharing of responsibilities, rights and duties between the primary stakeholders, in particular, local communities and the nation state; a decentralised approach to decision-making that involves the local users in the decision-making process as equals with the nation-state."[113] There can be no one set framework for successful co-management because social-ecological systems are widely varied in government, ecology, social setting, and culture.[114] Co-management is a broad spectrum that encompasses numerous processes and techniques, limited only by the ingenuity and creativity of the people involved. The ultimate tests are whether the resources are being sustainably managed and the participants believe the regime is effective.

Co-management is best viewed as a process for governance, not as a "formalized power sharing agreement."[115] The characteristics of co-management include pluralism, communication and negotiation, transactive decision-making, social learning, and shared action/commitment.[116] It is inclusive and collaborative. This means that co-management is heavily dependent on the relationships between the participants.[117] However, co-management has been analysed primarily in a local context so whether it is a viable strategy for a commons the size of the EEZ is doubtful.

[113] *Report from the International Workshop on Community-based Natural Resource Management* (1999), ,p. 11

[114] Plummer (2004), p. 877. See also, Carlsson (2008), p. 34. This is not to say that social-ecological systems cannot be analysed to determine how governance variables effect the success or failure of commons governance. See, Ostrom (2007) and Carlsson (2005), p. 67

[115] Carlsson (2005), p. 66

[116] Plummer (2004), p. 880

[117] Ibid.

# 3 POTENTIAL STRATEGIES FOR IMPROVING GOVERNANCE OF NEW ZEALAND'S EEZ

National governments are granted "sovereign rights" pursuant to UNCLOS III, so any attempt at EEZ governance reform must include the government. In New Zealand and the United States the sovereign rights to the EEZ are held in trust for the people.The government need not however be the primary driver of governance. This chapter will make some preliminary points about the timing of governance reform (Section A), discuss the traditional regulatory approach to addressing cumulative effects (Section B), and then analyse other potential strategies to improve governance of the EEZ (Sections C-E). The other potential strategies that will be discussed include government mechanisms, market mechanisms, and co-management.

## A Word about Maori Rights in EEZ Resources

Before proceeding a brief word must be said about Maori and their rights to EEZ resources. Maori have a special status in New Zealand, culturally, legally and politically. Maori derive their rights from numerous sources, including the Treaty of Waitangi, treaty settlements, and aboriginal rights.[118] Regarding resources relevant to the EEZ, the government and Maori have reached settlements concerning commercial fisheries, but Maori rights do no stop there.[119] The exact nature and extent of Maori rights in the EEZ are beyond the scope of this report, but Maori are more than a stakeholder. Whatever strategies the government may decide to pursue in the future Maori should be participants in the decision-making as warranted by their special status and legal rights.

## Timing of Governance Reform

The New Zealand EEZ is a vast place (15 times the land area of the country) and its closest neighbors are relatively far away. In the short term, conflicts between users will be few and far between.

Thought must be given, however, to the future because uses of the ocean resources are increasing as are their impacts.[120] Mining, and oil and gas companies are exploring, renewable energy companies (e.g. wind, wave and tidal) are looking to expand in marine waters, and aquaculture may extend outside territorial waters. In addition fishing, shipping, and the laying of submarine cables will continue. New Zealand is also committed to protecting its biodiversity, which will include (but not be limited to) marine protected areas and marine reserves.[121] Amending governance regimes will

[118] Pursuant to the English version of the Treaty of Waitangi, Maori have "full exclusive and undisturbed possession of their Lands and Estates Forests and Fisheries and other properties which they may collectively and individually possess . . ." According to the same article in the Maori version of the Treaty, Maori have the "unqualified exercise of their chieftainship over their lands, villages and all their treasures." Te Puni Kokiri (2002), p.10 and 12

[119] See Bess (2001) for a discussion about Maori rights to fisheries resources.

[120] Peart (2005), Chapter 7. See also, Halpern (2008)

[121] *Marine Protected Areas: Policy and Implementation Plan* and *Marine Protected Areas: Draft Classification and Protection Standard*

become more complex over time so New Zealand needs to be forward looking in order to be prepared to respond to the changes.[122]

To prepare New Zealand needs to be able to anticipate which uses are increasing and where they will be operating in order to determine when conflicts will arise that are not adequately addressed by the current governance structure. If numerous conflicting interests (i.e. more than two sectors with incompatible uses) are foreseen to occur in the same area then governance improvements for those areas may be necessary. It will be useful to attempt to forecast future uses in the marine environment and determine where potential conflicts are most likely to arise before they actually occur.

Reform will not need to be accomplished over the entire EEZ at the same time, but could be focused on particular areas or resources where uses are higher. For example, seamounts may be the focus of multiple conflicting interests. Seamounts can be productive fishing areas because many fish species congregate around them. They are attractive to mining interests because their volcanic nature means they can be rich in minerals. Seamounts are key areas for biodiversity so they have a potentially high conservation value. It is critical that the spatial scale for a sub-EEZ effort take broader ecosystem types and functions into account to allow for a full understanding of the impact to the environment.

Broader EEZ governance reform[123] is a type of future-proofing for when the case-by-case approach becomes insufficient.

## Traditional Regulatory Approach to Addressing Cumulative Effects

At this time the Ministry for the Environment is preparing legislation to close regulatory gaps to address environmental impacts and cumulative effects in the EEZ. Addressing cumulative effects through a regulatory framework has been a strategy in use worldwide for decades, although they often do an inadequate job.[124] A single, universally accepted approach to assessing cumulative effects does not exist.[125]

### Examples from the United States and New Zealand

Both the US and NZ have laws that seek to address cumulative effects. In the US the primary federal law is the National Environmental Policy Act (NEPA).[126] With a few exceptions the Act applies to all federal agencies.[127] It requires federal agencies to assess and take into account the environmental effects of their actions, including

[122] A NZ example of an emerging use overwhelming governance was the rapid growth in aquaculture applications under the RMA in the early 2000s. Regional councils were struggling to process the influx of consent applications for aquaculture farms in the territorial sea. The government put a two-year moratorium on aquaculture consent applications to allow the regional councils time to plan and delineate aquaculture zones..

[123] "Broader governance reform" does not include the current effort to fill regulatory gaps to address environmental effects, which should be completed as soon as practicable.

[124] There are instances where cumulative effects have been successfully addressed through the regulatory process. See e.g. Therivel (2007), pp. 369-370

[125] *Study on the Assessment of Indirect and Cumulative Impacts as Well as Impact Interactions* (1999), pp. ii-iii. Approaches to addressing cumulative effects have generally been classified as a scientific or a planning approach.

[126] 42 U.S.C. 4321 *et seq*

[127] *Citizen's Guide to the NEPA* (2007), p. 1

consideration of cumulative effects.[128] In New Zealand the primary law that addresses cumulative effects to the environment is the Resource Management Act (RMA) 1991. Administered by regional and district councils, the RMA seeks to integrate environmental management of land, water, sea (out to 12 nautical miles) and air. The Act also includes provisions regarding cumulative effects. The two approaches share many similarities.

***United States' National Environmental Policy Act***

Since NEPA applies to all federal agencies, guidance on how to implement the Act is usually issued by the Council on Environmental Quality (CEQ), which is housed in the Executive Office of the President and is charged with coordinating federal environmental policy. In a handbook on addressing cumulative effects the CEQ identifies three stages of a cumulative effects assessment: 1) scoping, 2) describing the affected environment, and 3) determining the environmental consequences.[129]

Each stage is broken down into further multiple steps. The scoping stage involves four steps: 1) identify the significant cumulative effects associated with a proposed action, 2) establish the geographic scope of the analysis (i.e. spatial scale), 3) establish the timeframe for the analysis (i.e. the temporal scale), and 4) identify other actions affecting the environment.[130] The handbook notes that federal assessments often underestimate the number of future impacts because they do not take into account state and locally approved actions. [131] In other words, analysis across different government agencies is incomplete.

The second stage, describing the affected environment, is a three step process: 1) characterising the resource, ecosystems and human communities, 2) characterising the stresses affecting these resources, ecosystems and human communities and 3) defining a baseline condition for the resources, ecosystems and human communities.[132] Obtaining the data necessary to perform this analysis is often one of the biggest challenges.[133] Stage 3, determining the environmental consequences, is a four step process: 1) identify the cause and effect relationship between human activities and resources, 2) determine the magnitude and significance of cumulative effects, 3) modify or add an alternative that would avoid, minimise, or mitigate the effects, and 4) monitor the effects.[134]

The extensive NEPA process is outlined to make the point that cumulative effect assessments are complicated, data-dependent undertakings. Not only do the regulators need information about natural resources of the receiving environment, they need to know about everything that *is* occurring and everything that *will* reasonably occur in the affected environment and how that all works together to affect the environment. If the data are lacking, the regulators have to make decisions based on assumptions or educated guesses.

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[128] Ibid.
[129] *Considering Cumulative Effects under the National Environmental Policy Act* (1997)
[130] Ibid. p. 11
[131] Ibid. p. 19
[132] Ibid. p. 23
[133] Ibid. p. 31
[134] I *Considering Cumulative Effects under the National Environmental Policy Act* (1997), p. 37

### *New Zealand's Resource Management Act*

In New Zealand cumulative effects assessments are part of the Resource Management Act (RMA). The RMA does not apply to the EEZ because it is limited to 12 nautical miles. It is the best New Zealand example for "lessons learned" on the traditional regulatory approach to cumulative effects assessments. Under the RMA it is still an open question as to what is the appropriate scope for cumulative effects assessment.[135] A recent discussion paper identified three tasks for performing a cumulative effects assessment:[136]

1) Identify the resource
2) Determine the capacity of the resource and set sustainable limits, and
3) Determine when enough is enough.

The NEPA and RMA approaches are similar. Both require determination of the spatial scale, analysis of all significant impacts to the environment regardless of the sector, and include some element of forecasting uses, and an attempt to determine what level of impacts are acceptable. Both are not straightforward, and have mixed results.

## Traditional Regulatory Approach to Assessing Cumulative Effects in the EEZ

In the context of the EEZ, under the proposed new law, performing cumulative effects assessments will have technical challenges. In identifying the resource there are issues of data availability and of scale. Simple identification can be challenging given the fact that the resources are hundreds of metres underwater. One cannot download satellite images of the earth's surface as can be done at the macro level on land. Scientists have used what data and information do exist to delineate regions based on biogeography, but there is a worldwide lack of data about deep ocean resources.

Identifying the appropriate scale at which to analyse cumulative affects is not obvious. Is the affected environment all of the EEZ? Is it the biogeographical region? Is it the habitat type? Is it the extent of the actual effects of the project? A scale encompassing the entire EEZ is too large but a scale of the actual spatial scope of a proposed project is too small. A project or activity will not affect the entire EEZ and even a project with broad impacts will not distribute those effects evenly across the entire EEZ. For example, fisheries are not one monolithic activity but a series of management regimes for different species broken down into regions.[137] Even within a region, the fishing impacts are usually not evenly distributed. Consequently, assessing the impacts of fishing and other activities on an EEZ-wide scale is not appropriate because such an assessment would not relate to the nature or scope of the impacts.

Similarly, assessing cumulative impacts on the scale of the specific project or activity is also inappropriate because it is not broad enough to capture synergistic effects or capture the effects of numerous activities building up over time. If the analysis is only of the specific site, effects from offsite that impact on the same environment would not be adequately considered.

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[135] Milne (2008), p. 6
[136] Ibid. pp. 9-13
[137] See *Annual Report 2006/07,* Ministry of Fisheries

The appropriate scale is somewhere in the middle, although it is far from obvious what the appropriate scale should be. New Zealand's National Institute of Water and Atmospheric Research (NIWA) developed for the Ministry for the Environment a series of environmental classifications for New Zealand's EEZ.[138] These classifications were based on data such as depth, solar radiation, sea surface temperature, tidal currents and slope.[139] NIWA generated a series of maps that classified the EEZ into 2, 4, 9, 15, or 20 levels.[140]

The answer then may not be found at one particular scale but at multiple scales. Analysing according to the marine classification would be helpful because that scale takes the environment into account. But this might miss synergistic effects in other marine regions or fail to account for one habitat type that appears in multiple regions (e.g. seamounts) being targeted. Looking at broad impacts across habitat type regardless of which classified marine environment it is in would also be helpful to ensure that some particular habitats are not taking the brunt of the impacts. Looking at only habitat types does not take into account how different habitat types function together or life cycles of living resources. Analysing one scale will likely not be sufficient— cumulative effects should be analysed at multiple scales to ensure that there is not a "pooling" of effects in specific places, habitats, or bioregions.

The second stage of the process to assess cumulative effects is to determine the carrying capacity of the resource and set sustainable limits. This relates back to the problem of lack of data and knowledge. How does one go about setting carrying capacity for the EEZ when we do not have knowledge of what resources are down there or how they function together? Regional ecosystem assessments are being performed in some places around the world but relating that back to how much use should be allowed is still new territory. Regulators may be able to set a carrying capacity for the various fisheries, but that does not necessarily equate to the carrying capacity for the various habitats, non-commercial species, or ecosystem functions. Some solutions could include setting limits on benthic impacts to habitats or impacts to bioregions.

The third stage is deciding when enough is enough. If signs of degradation start to appear chances are the regulation of the impacts have come too late. Given the scale of ocean ecosystems, if decline is noticeable then the damage has probably already been done. Regulators should seek to prevent a long-term downward trend. This can be difficult given the natural variability of ecosystems. For example, a "bad" year of productivity does not necessarily mean the species or ecosystem is on the decline because the downturn could be within the range of natural variability of the system. Knowing whether the downward trend is due to natural variability or a negatively impacted ecosystem can be difficult to discern.[141]

Even if the practical difficulties are addressed, the review of cumulative effects through a consent application process is to make a decision only on the project being reviewed. Will the project be approved and, if so, what conditions will be placed on

[138] *The New Zealand Marine Environment Classification* (2005)
[139] Ibid. p. 7
[140] Ibid. pp. 39-41
[141] Schlager (1994), p. 297

it? The final decision is about the impact of one project. In effect, the regulator is looking for the one project that will be the straw that breaks the camel's back. At the scale of the EEZ, and with the lack of knowledge about it, it is doubtful whether this is possible.

***Advantages***

*Appropriate to the problem*: The technical difficulties are challenging but there are definite strengths to a regulatory approach to addressing cumulative effects. The first strength is that the scale of the solution fits the problem at hand. The level of risk from the increasing uses of the EEZ is small and will remain so into the near future. Currently the largest impact is from fishing activities and a law exists to address those specific impacts. Given the relatively low risk of increasing uses outside of fishing, addressing cumulative effects addresses the risk currently at hand.

*Models exist*: A second strength is that methods exist to perform a cumulative effects analysis. Assessing and addressing cumulative effects has been done for decades and New Zealand can learn much from these efforts. Most efforts have not been particularly successful but they remain a source for learning.

*Low implementation costs*: This approach has relatively low implementation costs. In the near term, New Zealand anticipates that there will only be a handful of consent applications a year under this new regulatory regime.[142] This regime will address the issues at hand at relatively low costs, and some of those costs will be borne by the applicant.

*Improved integration*: Addressing cumulative effects should mean that the regulating authority will be looking at impacts from all sectors. One of the weaknesses of New Zealand's current governance regime for the EEZ is that it is fractured and managed on a sector-by-sector basis. Assessing cumulative effects means that the regulating authority will be looking across sectors so a comprehensive view of uses and anticipated future uses can be analysed. A first step to improving integration is to know what each government agency is doing, and this approach will help accomplish that. The cross-sectoral analysis should include forecasting of future uses in order for New Zealand to stay in front of the growing uses. When a congregation of activities looks like it will appear in the near future then New Zealand may want to consider broader governance strategies for those "hotspot" areas.

***Disadvantages***

*Lack of comprehensive view:* In addition to the technical difficulties outlined above, a cumulative effects regulatory approach has some weaknesses. Ultimately it is primarily an analysis of one project. This will limit the government's ability to be forward-looking because it reacts to what the applicant is proposing for a particular spot. The country's ability to determine how it wants to use or conserve its ocean resources as a whole is limited. If a country does not define where it wants to go then where it ends up is a matter of chance.

[142] It should be noted that fishing will be excluded from this consent process because fishing activities are managed under the Fisheries Act.

*No sectoral tradeoffs*: Even though the traditional regulatory approach will allow for cross-sectoral analysis, it will not allow for cross-sectoral tradeoffs. If there is a conflict of uses on what basis is the decision made as to which use has priority? Is it the existing use—which would likely be fishing? If the existing use has priority, what level of impact on the existing use should be allowed by a new use? What if the new use has a potentially greater economic benefit with less environmental impact? These questions will not necessarily be answered through a cumulative effects analysis. The tradeoffs will be decided by the ministry responsible for consents or by an environmental court on a case-by-case basis. Even if the two sectors are interested in working issues out amongst themselves, a formal mechanism is lacking. This inability to make decisions between sectors will be a weakness that will grow over time as more and more uses compete for EEZ resources.

*Non-use values are not adequately accounted for*: Addressing cumulative effects is entirely calibrated on looking at uses. Non-use values are only considered indirectly and then in the context of whether and under what conditions a use should be allowed. If the history of the Resource Management Act is any guide, most consents will likely be issued.[143] The consent process will primarily set conditions on that use. Under the traditional regulatory approach there is no mechanism for considering non-use values on their own basis. Other laws exist to achieve non-use goals, but they are not linked to this regime. So consents may be approved year after year for increasing uses while non-use values do not proceed at all. Ideally there would be a mechanism for tradeoffs not only between sectors, but between use and non-use values. Without such a mechanism it is likely that as new uses are approved non-use values will make slow or no progress.

## Government Mechanisms for Improved Governance

There are three mechanisms that address governance of the commons: the government, the market, or co-management.[144] These categories are neither mutually exclusive nor strictly delineated. Government control may include market mechanisms; market mechanisms first need the government to create the market; co-management will include governments and may include market mechanisms. The distinction between the three is based on the **primary** mechanism for ongoing governance. This section discusses two broad government mechanisms: coordination of government activities and area-based management.

### Coordination of Government Activities

Fractured governance is one of the significant weaknesses of the EEZ governance regimes of the United States and New Zealand. A strategy that could improve governance is to better integrate management across government agencies. This can be done in a number of ways but this report will focus on two methods for accomplishing more integrated management of the EEZ: a whole-of-government effort and an 'overlord' ministry. Both of these strategies are focused on governmental improvement, that is they are primarily concerned with how government ministries relate to each other, not to outside stakeholders.

[143] Milne (2008), p. 2
[144] Juda (2001), p. 44

### *Whole-of-Government Approach*

One method to have government ministries better coordinate activities is to require them to form a coordinated, multi-agency, which has been done at the federal level in the United States. The US Commission on Ocean Policy considered improved federal coordination as a "first step" to improve management and governance of the oceans.[145] The Commission recommended that a National Ocean Council (NOC) be created that would be made up of high-level officials from all of the relevant federal agencies.[146] In response to this recommendation, President George W Bush issued an Executive Order creating a Committee on Ocean Policy to "coordinate the activities of executive departments and agencies."[147] The Committee provides advice on the establishment of policies, obtains and disseminates information, facilitates activities between government agencies, and coordinates government activities.[148] No new laws were passed so each agency relies on their existing statutory authorities to achieve the Committee's purpose.[149]

New Zealand could follow a similar approach. In fact, during the work on developing an Oceans Policy carried out between 2000 and 2003, the Ministry for the Environment developed a plan for such an effort that was shelved when the Oceans Policy work was put on hold mid-2003. A whole-of-government effort would entail the establishment of an interagency group made up of representatives from each of the relevant ministries, tasked with coordinating their regulatory authorities, monitoring activities, and planning efforts. This would not require any new legal authorities, but the whole-of-government group could be charged with identifying statutory conflicts and developing recommendations for addressing those conflicts.

A whole-of-government effort will be more effective if it is working to achieve something concrete. For example, the effort could (through its own initiative or by being tasked with it) identify a few priority issues that reach across ministries, develop strategies and actions to address those priorities, and then explicitly divide the work amongst the ministries to implement the identified actions. In this way, the whole-of-government could become a focal point for action and not just coordination.

This strategy has met with some preliminary success in the United States. In response to the US Commission on Ocean Policy's recommendations, many of the coastal states in the US initiated interstate regional efforts to develop shared management or action plans.[150] The federal agencies have committed to assist these regional efforts. While the long-term success remains to be assessed, they have been highlighted as one of the bright spots in United States ocean governance reform.[151]

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[145] US Commission on Ocean Policy (2004), p. 77. The Pew Oceans Commission called for the creation of a similar Interagency Oceans Council within the Executive Office of the President. *Pew Oceans Commission Summary Report* (2003), p. 22-23

[146] US Commission on Ocean Policy (2004), p. 79

[147] Executive Order 13366, December 17, 2004. 69 Fed. Reg. 76591, 21 December 2004

[148] Ibid.

[149] Ibid.

[150] The Gulf of Mexico Alliance, a partnership between the five Gulf states and over a dozen federal agencies, released the *Governors' Action Plan for Healthy and Resilient Coasts* in March 2006. The Alliance has completed over 75% of the plan thus far. On the Pacific coast, the Governors of California, Oregon and Washington entered into the West Coast Governors Agreement for Oceans Health in September 2006. A Joint Action plan is scheduled for release in 2008.

[151] Joint Ocean Commission Initiative Report Card (2008)

*i. Advantages*

*Improved integration*: This approach would address the concern of fractured governance. There would exist a formal, ongoing forum for the various ministries to coordinate their activities in the EEZ. An ongoing forum can also lower the costs for coordination on future issues the structure would already be in place. In addition to the advantages of open dialogue and coordination the opportunity exists for relationships to be built or enhanced between the staffs of various ministries.

*Low implementation costs*: A whole-of-government approach has low costs in both its creation and its operation. It does not require a lot of money or staff time to have representatives from the ministries get together from time to time, e.g. on a monthly basis. This approach would not require any new laws but could be put in place by government order. The increased coordination may even result in increased efficiencies by identifying duplicated efforts that can be eliminated.

*ii. Disadvantages*

*Lack of substantive progress*. Intergovernmental committees have their weaknesses and limitations. Meetings can fail to resolve issues, or create action points for moving forward. This results in additional time obligations on staff with insignificant improvements in coordination.

*Lack of accountability*. Group committees--government and nongovernment alike--frequently suffer from lack of accountability. Since it is the committee as a whole that is responsible, any one agency or ministry can avoid responsibility and suffer no consequences. This weakness can be overcome by clearly delineating which agency is responsible for each action under set timeframes.

*Continuance of statutory "impediments"*. One of the challenges to managing marine resources derives from the fragmented existing legal framework. The ministries and agencies derive their legal authorities from these laws and are charged with their implementation. A government coordination activity will not address any weaknesses of or conflicts between existing laws.

*Lack of stakeholder involvement*. A whole-of-government effort does not actively involve the stakeholders. Significant improvements other than increased government coordination are unlikely if the stakeholders are not involved.

*No sectoral tradeoffs*. A government committee does not facilitate negotiations or relationship building between the various sectors. While whole-of-government efforts can create cooperation between ministries it does not assist in doing the same between sectors.

*Possible lack of comprehensive view*. Improved coordination of government action does not necessarily result in a comprehensive view. If a joint committee is charged with coordination, it may focus on coordination of ongoing activities and fail to analyse overarching problems or issues. Improved coordination does not necessarily result in improved vision.

***'Overlord' Ministry***

A more aggressive approach to improving government coordination is to create a ministry or committee that has some level of authority over the other various ministries. For example, in the United States, the Pew Oceans Commission called for the establishment of regional ocean ecosystem councils that would create enforceable regional governance plans that would be binding on all parties.[152] The overlord ministry would require other ministries or departments to comply with an overarching plan and each relevant ministry would be required to adjust its regulations or management to comply with the overlord ministry's direction. This approach would require a new law to empower a ministry with these new authorities and direction. It would also probably require amendments to various statutes to ensure consistency across the legal structure.

*i. Advantages*

*Comprehensive view*. Granting one agency the responsibility of improved government coordination and the authority to achieve it could result in a comprehensive, cross-ministry view, improve coordination, and facilitate integration. The overlord ministry would not be constrained by the sector-by-sector management that characterises the current governance.

*Improved integration*. Integration and coordination of government activities would likely improve. With the authority to direct all of the relevant ministries, the overlord ministry could maneuver the puzzle pieces of sectoral management to fit together into a rational whole. The potential problem of recalcitrant ministries would also be overcome because the overlord ministry would have the authority to require compliance..

*Prevents state "capture"*. An overlord ministry would also not be as susceptible to "capture" by the regulated community. Capture occurs when the sector that the ministry regulates has too much influence over the ministry's decisions.[153] The overlord ministry would not be regulating any one sector but directing the relevant agencies. Because numerous sectors would be involved, one sector would be much less likely to inappropriately influence the overlord ministry.

*ii. Disadvantages*

*High costs to create and implement*. The costs to create an overlord approach would likely be prohibitive for a couple of reasons. The first costs would be process costs. This strategy would require the passage of a new law and amendments to a number of other laws. The passage of new laws is usually a laborious, time-consuming process. The second type of creation costs would be political. Some of the ministries and their stakeholders may resist becoming subordinate to an overlord ministry and may use their political capital to try to prevent its creation. Overcoming these vested interests would probably be difficult. After the costs of creating the overlord ministry, there would also be operational costs. The new overlord ministry would require significant

[152] *Pew Oceans Commission Summary Report* (2003), p. 21
[153] Grafton (2000), p. 508

new capacity and funding. Even assuming the overlord ministry would be housed in an existing ministry, the new overarching responsibilities would require significant new staff and funding to achieve the goals.

*Additional layer of bureaucracy.* Another layer of bureaucracy could lead to less effective decision-making and decreased government efficiency. Giving an overlord ministry broad decision-making powers means decisions will be made at a level of government that is further removed from the sectors affected by decisions. The lack of specialisation and increased distance could result in unintended consequences because the overlord ministry might not completely comprehend the nuances and ramifications of its decisions. An additional layer of bureaucracy could also result in decreased government efficiency because relevant government actions would have to go through another level of approval.

*No sectoral tradeoffs.* The overlord approach would allow the ministry to consider tradeoffs between sectors, but it would not create a mechanism for the sectors to do it themselves. In other words, all of the tradeoff decisions would be housed in the overlord ministry. A better approach would be to allow the different sectors to work it out amongst themselves if they can.

**Area-based Governance Strategies**

There is a rising call for area or place-based management of the oceans.[154] These proponents view area-based strategies as a way to overcome spatial and temporal mismatches[155], accommodate the heterogeneity of the full suite of ocean uses[156], tailor management to on-the-ground circumstances, and offer a way to deal with the inherent uncertainties of managing the marine environment.[157] All types of area-based management necessarily have a spatial focus but there are multiple ways to utilise this strategy.

For the purposes of this report I will adopt the definition of "place based management" used by Young et al as "a strategy that calls for integrated management of the full suite of human activities occurring in spatially demarcated areas identified through a procedure that takes into account biophysical, socioeconomic, and jurisdictional considerations."[158] This report will use the terms "place-based management" and "area-based management" interchangeably.

This report defines "marine spatial planning" as "a forward-looking, comprehensive planning process that analyses current and future spatial uses of the marine environment." This definition differs from some existing definitions.[159] Other

[154] See, Young (2007), Norse (2005), Eagle (2008), Ehler (2007)
[155] Crowder (2006), p. 618
[156] Norse (2005), p. 432
[157] Young (2007), p. 22
[158] Ibid.
[159] See e.g. Ehler (2007), p. 13 which defines marine spatial planning as "a process for analyzing and allocating parts of three-dimensional marine spaces to specific uses, to achieve ecological, economic, and social objectives that are usually specified through the political process; the MSP process usually results in a comprehensive plan or vision for a marine region." The United Kingdom's Department for Environment, Food and Rural Affairs (Defra) has defined it as "a strategic plan for regulating,

definitions incorporate the actual allocation of space into the definition of marine spatial planning. The definition used in this report decouples the planning from the regulatory action. Once space is allocated pursuant to a marine spatial plan then the term "ocean zoning" will be used. This report adopts UNESCO's definition of "ocean zoning", which is "a regulatory measure to implement marine spatial planning usually consisting of a zoning map and regulations for some or all areas of a marine region."[160]

### *Marine Spatial Planning*

Uses of the ocean are increasing and that trend will continue in the future. Many of these uses do not create conflict, that is multiple uses can take place in the same area. Recreational fishing and submarine cables, for example, can use the same location with no significant conflict. However, some uses will conflict. For example, if large underwater turbines or an offshore windfarm were located in prime fishing grounds, they could conflict with commercial fishing. The problem is the ad hoc nature of the allocation of space in the oceans. Since marine resources have been allocated by separate ministries under different statutes, the ministries do not have a complete picture of how their allocation of resources relates to the allocations of other ministries and whether they conflict.

Marine spatial planning can help identify and analyse issues of conflict by supplying a spatial analysis of current and future uses of the marine environment and the level of potential conflict between the uses.[161] Marine spatial planning can help rationalise the allocation of marine resources so the regulating authorities are no longer in a position of being wholly reactionary and they can make better informed decisions.

#### *i. Are the Conditions Ripe?*

It is first necessary to determine whether or not the conditions warrant the use of marine spatial planning. Marine spatial planning helps to rationalise the allocation of marine space.[162] If an area is not heavily used and use patterns are not expected to significantly change, there is little need to implement marine spatial planning. Its use to date is limited to areas of dense use,[163] where the potential benefits are increased. It should be noted, however, that implementing spatial planning and management will be less contentious when use is lower.

In New Zealand's EEZ, the conditions are probably not ripe for marine spatial planning because it is not an area of dense use. The area is vast and the conflicts are few. As renewable energy, aquaculture, oil and gas development, and mining activities grow, hotspots of use may arise that warrant some rationalisation of space allocation. The need for marine spatial planning will probably arise in the territorial sea sooner than in the EEZ because there are more existing uses and growth will occur faster in the territorial sea.

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managing and protecting the marine environment that addresses the multiple, cumulative, and potentially conflicting uses of the sea.' Tyldesley (2004), p 4

[160] Ehler (2007), p. 13

[161] See Douvere (2007), p. 185

[162] Ehler (2007), p. 24

[163] For example, the Belgian part of the North Sea is "one of the most exploited areas in the world." Douvere (2007), p. 185

*ii. How Would Marine Spatial Planning Work?*

The first step in marine spatial planning is to determine the spatial scale and boundaries the plan will cover. It can be massive (e.g. Great Barrier Reef) or much smaller (e.g. Belgian part of the North Sea). The area does not need to perfectly align with ecosystem boundaries but it should take ecosystems into account. The most appropriate area will be where there is an intersection of current and short term future uses, conflict between those uses, and significant impacts on ecosystems or resources.

Once a planning area has been determined the next step is to map the resources and the current uses to determine the current state of affairs. The map can be a strong exhibit of the failure of an ad hoc approach.[164] The visualisation of all uses on one map can be a powerful tool for regulators because they can put their individual decisions into a more comprehensive context.

Concurrent with the mapping of the resources and uses, an analysis should be conducted of the level of conflict between uses. Not all uses will conflict with each other. It is probably sufficient to compare all uses with each other and categorise the level of conflict as high (cannot operate in the same space), medium (can operate in the same space with some regulation of activity), or low (can operate in the same space without regulation of activity).

Based on the map of resources, current uses, and potential conflicts, both the regulators and the regulated community can make more informed decisions about where to place new activities. Project review and approval will become a simpler process. With the various sectors making decisions based on shared information, conflicts will likely be reduced.

Government agencies can also use the map to do some future planning. Informal agreements or understandings can be struck between government agencies where some accord is reached on what areas are most appropriate for various uses. Given that these agreements would not have legal authority, applicants would not be bound by them. Applicants could apply for a use in an area that would conflict with current uses and those applications would be reviewed under existing law. However, if an unused site is appropriate for the project, applicants are inclined to pursue that space because they know their application will be less likely to be contentious. Even though lacking legal rule, this sort of "soft law" approach can be effective.

*iii. Advantages*

*Comprehensive view*. Marine spatial planning provides a comprehensive, integrated view of both the uses and resources. This helps to address the weakness of fractured, sectoral management.

*Proactive*. Areas of potentially high use or conflict are identified allowing more aggressive management strategies to be considered for those areas. Marine spatial planning can help identify priority areas for management action as well as help define the problems or conflicts that need to be solved.

[164] See Ehler (2007), p. 61

*Reduces conflicts*. Conflicts are reduced by giving parties information to avoid them. If a project applicant has identified multiple viable site locations, the applicant will choose the site that it believes has the greatest chance for regulatory approval. Part of that consideration includes which interested parties will be negatively affected and what resources will be impacted. A marine spatial plan provides this information.

*Assists in project siting*. Appropriate areas for development are identified to encourage beneficial uses while protecting sensitive resources. If a country wants to pursue offshore renewable energy projects, by providing a map of current uses and sensitive resources the government can encourage projects to be developed in a particular area.

*Information efficiency*. The collection of data about uses and resources in one place is helpful to numerous agencies as they make their regulatory decisions. It can result in cost efficiencies by reducing duplication of efforts among government agencies.[165]

*Low political costs*. Because it does not have the force of law, the marine spatial planning process can be conducted without creating new laws.[166] It can be achieved through political will and some additional resources. However the plan may meet with some stakeholder resistance (which leads to the disadvantages of this approach).

*iv. Disadvantages*

*No legal force*: If a plan does not have any legal force, it can be ignored or subject to the vagaries of the political climate. If the marine spatial plan is created without high-level political support or the political support disappears then it could have little or no influence. If agencies ignore the plan then the fractured, cross-sectoral governance approach will continue.

*High implementation costs*. While the political implementation costs may be low, the actual implementation costs of staff time and monetary resources needed to obtain the data and information for the plan could be high. In the context of the EEZ, a complete picture of the impacted resources is unrealistic given its size, depth, and the mobility of many of the resources. The human use assessment data is not often available at a scale appropriate for management decisions. Given the current level of limited uses of the EEZ, however, a human use assessment is achievable. The best way to proceed given these limitations is to make the best plan possible given the existing data and then prioritise future data collection.

*No mechanism for tradeoffs*. Although it would assist sectors in avoiding conflicts, there would not be a formal mechanism for the sectors to negotiate with each other. It also fails to provide parties with any indication of their relative negotiating positions. Would existing uses always be given precedence? Would some new uses be encouraged? The plan in and of itself would not answer these questions, which could make it difficult for interested parties to negotiate resolutions among themselves.

[165] Ehler (2007), p.27.
[166] See Douvere (2007), p. 186

### *Ocean Zoning Without Property Interests*

The next level of spatial management gives a marine spatial plan force through ocean zoning.[167] Zoning can come with or without an attached property interest.[168] This section will address government-designated zones that do not have any property interests attached to the zones. Zones with a property interest will be addressed under the market mechanisms section.

Zoning can be used to control and distribute human activities across space and time.[169] It can reduce conflict, uncertainty and costs by separating conflicting uses and specifying how particular areas may be used.[170] Zoning has been used for decades around the world in the terrestrial context. For example, many communities pass zoning regulations to limit or prohibit the development of large industrial sites in residential areas. Zoning is a way to ensure that conflicting uses of land are separated in a rational way. Many proponents are now calling for a similar approach to the ocean.

Comprehensive zoning would require enabling legislation.[171] This legislation would need to outline the principles to which the zoning plan must adhere. Without legislative guidance on the principles, allocation would be very difficult because each sector would be working for their greatest benefit.[172]

There are two approaches to zoning: piecemeal and comprehensive.[173] A piecemeal approach creates zones for discrete purposes as it goes along. A recent example from New Zealand is the process for Aquaculture Management Areas.[174] The Resource Management (Aquaculture Moratorium) Amendment Act 2002 imposed a moratorium on aquaculture consents to provide the Regional Councils with the opportunity to designate aquaculture management areas and areas where aquaculture would be prohibited.[175] Zones for other uses were not created during this process. This approach does not have many of the advantages of comprehensive zoning because it maintains the sectoral approach to management. This report will focus on comprehensive zoning.

Comprehensive zoning means that all of the presently known uses and non-uses are allocated ocean zones at the same time. This does not mean that all of the EEZ would be zoned at the same time. Development of the oceans will be denser in some areas so comprehensive zoning could be undertaken in areas where conflicts are occurring or are anticipated.

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[167] Young (2007), p. 26

[168] I specifically use the term ‘property interest’ and not ‘property right.’ The government holds sovereign rights of the EEZ for the benefit of the people. Unless a property right is specifically and explicitly created by government, no one person has a ‘right’ to the use of the EEZ.

[169] Young (2007), p. 26

[170] Norse (2005), p. 432

[171] Eagle (2008) p. 21

[172] Ibid. p. 22

[173] Norse (2005), p. 436

[174] See the Resource Management (Aquaculture Moratorium) Amendment Act 2002, and Aquaculture Reform (Repeals and Transitional Provisions) Act 2004.

[175] Resource Management (Aquaculture Moratorium) Amendment Act 2002, Part 1, Section 3

Comprehensive ocean zoning allocates ocean space to all of the uses and designates areas of non-use within a designated area at the same time. The most famous example of comprehensive ocean zoning is the Great Barrier Reef Marine Park (GBRMP).[176] The zoning plan for the GBRMP zones all 344,000 km² of the park. The four major zones for the marine park are:[177]

- General Use: allows all reasonable uses
- Conservation Park: allows for limited fishing, trawling, and collecting
- Protection: prohibits trawling
- Marine National Park: no-take zone; prohibits all fishing and collecting[178]

All of the zones are spatially defined and rules exist for each of the different types of zone. It should be noted that the ultimate purpose for the Great Barrier Reef Marine Park is the conservation of the reef. Uses are allowed but conservation of the reef is the guiding force for the zoning plan. In most areas of the ocean, the conservation goal will not be as prominent. Conservation will be one among many goals.

*i. General Types of Zoning*

Two of the basic building blocks to zoning are the dominant use zone[179] and the multiple use zone.[180] A dominant use zone designates one use as the priority for that zone. Regulators can allow other uses of the zone as long as it does not impede the priority use.[181] Multiple use zones are areas where a number of different compatible activities are allowed. While the designations and rules controlling zones are numerous and varied, they will generally fall within one of these two types of zones.[182]

***Dominant Use Zones***

Dominant use zones create an unvested property interest for the designated sector as a whole, and provide the various sectors with some certainty about their respective legal rights within that zone.[183] For example, if an oil and gas company wanted to develop within a commercial fishing zone, the company would have to achieve agreement with the fishing interests in the zone. Both parties would understand that the onus is on the oil and gas company to meet the demands of the fishing interests. This works the same way if the positions are reversed. If commercial fishing wants to fish in an oil and gas zone then it will be the fishing interests having to meet the demands of oil and gas. It should be noted that a dominant "use" can be a non-use value such as conservation.

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[176] See Fernandes (2005)
[177] There are four other types of zones in the park but they make up less than 5% of the park. *Zoning in the Great Barrier Reef Marine Park* (2007)
[178] *Zoning in the Great Barrier Reef Marine Park* (2007)
[179] Eagle (2008), p. 8. The most extreme form of a dominant use zone is an exclusive use zone that allows for one use but excludes all others. For example, a no-entry zone around a high security military installation.
[180] Young (2007), pp. 27-28
[181] Ibid.
[182] These two general categories are for explanatory purposes. Zones exist along a continuum between these two categories, and they do not necessarily fall into one category or the other.
[183] Eagle (2008), p. 8

Government would have the authority to override the dominant use sector if they thought the proposed second use was compatible or that the dominant use sector was being unreasonable in its demands. The dominant use sector would have some protection pursuant to the law so if a ministry chose to approve a conflicting use within the zone then the aggrieved sector would have the opportunity to appeal that government decision. If the government acted within their authority pursuant to the law then the sector would not have a claim to any remedy from the government.

### *Multiple Use Zones*

A multiple use zone allows for compatible activities to occur in the same space. Given the range of uses in the oceans this zone will likely be the most prevalent and of broadest use. The category of multiple use zones encompasses many permutations, and can be configured in a number of different ways, such as:

- Allowing all uses except for explicitly defined prohibited activities;
- Listing a number of different allowed uses without setting any priority between them;
- Prioritising a suite of different uses so some uses are deemed subordinate to others; and
- Allowing for a number of uses and developing a suite of criteria for conflict resolution.

The flexibility of multiple use zones can be a real advantage because it allows the regulators to carefully tailor the zones to management needs.[184] The flexibility must be tempered with the need for simplicity or users will find it difficult to comply.[185]

For ocean zoning it is critical that the public be actively and meaningfully involved in the creation of the zoning scheme.[186] If the stakeholders are involved and believe the process is fair they are more likely to accept the outcome.[187] This is important to ensure high rates of compliance.[188]

#### *ii. Advantages*

*Improves integration*. Comprehensive zoning is cross-sectoral; by considering all uses it provides for them to fit together in a rational whole. Lack of integration is one of the major weaknesses of current governance which comprehensive ocean zoning can directly overcome.

*Enables tradeoffs*. Because this approach is supported by regulations it allows for and encourages tradeoffs between sectors both during development and after the zoning scheme is in place.[189] Tradeoffs during development can create regulatory efficiencies by rewarding appropriate projects within zones with reduced regulatory review. For

[184] In the United States, the National Marine Sanctuaries are a good example of multiple use zoning.
[185] Day (2002), p. 147
[186] Fernandes (2005), p. 1742
[187] Young (2007), p. 28
[188] Ibid.
[189] Ibid. p. 27. See also, Halpern (2007), p. 8

example, an oil and gas dominant zone is created. This would create an assumption that as long as the oil and gas development meets international best practice standards then it can move forward. The regulatory review time for these projects could be reduced and a higher level of certainty for approval ensured, an important factor for business investment decisions. Environmental concerns would be decreased because they would have been at the table during the development of the zoning scheme and conservation goals would have been incorporated into the regime. After the zoning plan is in place, negotiations between sectors are enhanced by clarification of the rules for making decisions between sectors. Although a property interest does not vest, zoning can give the different sectors more certainty in what their relative positions are within zones.

*Accounts for non-use values*. Ocean zoning is one of the few strategies that allow for the tradeoff between use and non-use values. In the United States and New Zealand, ocean uses are increasing but ocean conservation appears to be lagging behind.[190] With zoning, increasing ocean use and enhancing conservation are considered together.

*Proactive*. Ocean zoning is proactive and forward-looking, allowing for thoughtful planning toward rational goals. Currently, use is piled on top of use with very little (or no) thought given to what is the desired state. Ocean zoning allows a society to decide on rational goals and implement a framework to achieve those goals.

*Participatory process*. The development of ocean zoning allows for society to engage in a debate about the various uses, their relative importance and then make allowances for all of those uses and non-use values in a comprehensive plan.[191] This approach can improve stakeholder buy-in and compliance with the plan.[192]

*May address temporal mismatches*. Proponents of ocean zoning also suggest that it will address temporal mismatches between biological systems and human interventions.[193] This may be the case to some degree but I do not think this is one of zoning's greatest advantages. The ability to match temporal scales is probably derived from the laborious process necessary to create a comprehensive zoning plan.

*iii. Disadvantages*

*Does not address some important issues*. Even proponents recognise that ocean zoning would not be a panacea.[194] Some commentators have suggested that ocean zoning would address the spatial mismatches between scales of ecosystems and governance regimes.[195] I do not think zoning will overcome the most critical spatial mismatches because ocean zoning will not adequately address threats that defy spatial restraint, such as land-based impacts, invasive species or some cases of over-fishing. Zoning would not obviate the need to regulate these impacts. In fact, some of the

[190] There are some exceptions to this general trend. In June 2006, for example, President George W Bush created Papahanaumokuakea Marine National Monument, the largest marine conservation area in the world at that time.
[191] Young (2007), p. 28
[192] Ibid.
[193] Crowder (2006), p. 618
[194] See Norse (2005), p. 439
[195] Crowder (2006), p. 618

greatest impacts on the oceans are from land-based sources.[196] It would be difficult for ocean zoning to address over-fishing, given the political clout of fishing interests.It may limit the area and manner where fishing can occur, but would not reduce the overall catch.

*High implementation costs*. Development of a comprehensive scheme of ocean zoning will have extremely high implementation costs. For the government, it requires enabling legislation, staff capacity and resources to run the process, and significant data and information over a number of years. It will require the stakeholders to invest significant time and resources to engage in the process, with no guarantee that the process will be successful.[197]

*High political hurdles*. Comprehensive ocean zoning will be difficult to accomplish because powerful vested interests exist in the status quo.[198] These interests include sector representatives, special interests, and individual government agencies. Any sector that currently has an advantage through the current *ad hoc* approach will want it to continue. Overcoming these vested interests would be extremely difficult.

## Market Mechanisms for Improved Governance

Hardin saw the solutions to the "tragedy of the commons" resulting from either government action or privatisation of the resource. Privatisation is a “decentralized approach which endeavors to create exclusive, private, and transferable rights over the flow ... of CPRs.”[199]. This section will address the second of Hardin’s proposed solutions: privatisation via market mechanisms.[200]

Discussions about privatising public resources tend to be controversial.[201] The proponents of privatisation say that market mechanisms remove the perverse incentives of the commons by providing incentives to manage the resource for long-term sustainability.[202] According to its advocates, market mechanisms lead to the most efficient and beneficial use of the resources.[203] Opponents to privatisation, on the other hand, believe that privatising public resources would violate the public trust and that market approaches are unable to appropriately account for all of the use and non-use values of society.[204] The ideal solution for privatisation would be to create and distribute property rights in such a way that increases efficient use of the resources, limits access to the resources to a sustainable level, and provides market incentives for conservation and other non-use values.[205]

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[196] Halpern (2008), p. 950

[197] See Weible (2004) and his discussion of the multiple efforts to develop a system of marine protected areas along California’s central coast.

[198] Young (2007), pp. 30-31

[199] Grafton (2000), p. 504

[200] Mansfield (2004), p. 314 argues that “privatization and marketization are not the same thing.”

[201] Tietenberg (2002), p. 198. Tietenberg hypothesises that the controversy stems from the allocation of wealth of a public resource, the incomplete internalisation of the externalities, and the ideological belief that since capitalist property rights are the cause of the problem they cannot be the source of the resolution.

[202] Yandle (2007), p.27

[203] Mansfield (2004), p. 313

[204] See Osherenko (2006)

[205] Mansfield (2004), p. 319. Another goal is reducing over-capitalisation in the market.

**Tradable Environmental Allowances**

One of the more widely-used market-based mechanisms in the environmental context is Tradable Environmental Allowances (TEAs), a market-based system that "define a limit to environmental withdrawals or emissions and permit free trade of allocated allowances under those limits."[206] TEA regimes are often used for "cap and trade" systems to limit greenhouse gas emissions. TEAs are not limited to pollution. In fact, New Zealand has been a world leader of a market-based approach to fisheries management.

In 1986 New Zealand instituted a system of Individual Transferable Quotas (ITQs), a market-based system of property rights to manage its fisheries.[207] Under this system the Quota Management System (QMS) was created. The purpose of the QMS is to ensure sustainable fisheries and promote economic efficiency in the fishing industry.[208] Before catch limits were set, management areas were selected for each species.[209] Each fish species in the QMS was divided into Quota Management Areas (QMAs), each of which is managed independently.[210] A Total Allowable Commercial Catch (TACC) is set annually for each commercial species within a QMA based on maximum sustainable yield.[211] The QMS created rights to harvest a percentage of a specified commercial species in a specified area during one fishing year. The quotas are an asset that can be sold or leased. This system is designed to allow market pressures to create incentives for sustainability and greater efficiency.[212]

The QMS, however, is of limited application. It only applies to commercial fish species. It does not include all of the marine resources of the EEZ. It does not address spatial conflicts. ITQs grant a property right to extract a certain amount of fish in a general region; but do not grant the holder any explicit spatial property rights.[213] Market strategies do exist (in theory at least) that would encompass the full suite of marine resources and address spatial conflicts between different sectors.

TEAs can work for the resource subject to the allowance but it can leave other resources unprotected.[214] In the context of EEZ it would be difficult to allocate TEAs across the board, especially as a common currency between the various resources does not exist. For example, equating numbers of fish to minerals extracted is theoretically possible but practically speaking not useful. Also, other than arguably for some species of fish, the governance challenges in the EEZ do not derive from over-extraction but potential conflicts between uses.

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[206] Dietz (2003), p. 1909.
[207] Lock (2007), p. 9.
[208] Ibid.
[209] Ibid. p. 3
[210] Ibid.
[211] Ibid. p. 8
[212] Ibid. p. 1
[213] Even though they do not hold an explicit spatial property right, fishing interests can argue that a conflicting use or nonuse in a particular area would 'unduly interfere' with their interests. Fisheries Act 1996, Section (5)(6)(c)
[214] Lock (2007)

## Ocean Zoning with Property Interests

This section discusses ocean zoning as a privatisation regime for improving governance. The primary distinction between the government mechanism and the market mechanism is that a property interest vests with the market mechanism. Ocean zoning in a privatised framework does not mean alienation, and does not entail government selling the ocean.[215] It grants some exclusive, alienable rights to private parties, be they individuals, sectors, or groups. The closest land-based analogy would be a long-term lease in real estate.

The first step to privatisation of a commons resource such as the EEZ is that government must create the market. Since the EEZ is currently a common pool resource where very limited spatial property rights exist, the government would have to create the market of property rights. To design a new system of property rights, fundamental design issues must be addressed.[216] These include:

- flexibility/divisibility: whether rights holder can lease part or all of the rights;
- exclusivity: whether rights holder can exclude others;
- quality of title: whether it is a right to all the resources or a proportional share;
- duration: life term of the right and whether a preference exists for renewal; and
- transferability: basis for initial vesting; whether there are limits on transferability.[217]

### *How Would Zoning with Property Interests Work?*

A private property zoning regime could be created pursuant to these five property characteristics. This report will focus on two general types of zones: dominant (including exclusive)-use zones and multiple use zones. The choice of the type of zone for a particular area would ideally be accomplished by government development of a comprehensive plan. Under this plan, conservation and cultural zones would need to be created and set aside first because non-use values are not adequately protected in a market-based regime.[218] Dominant use zones would be used primarily to protect existing uses or to encourage development of particular resources in specific areas. Multiple use zones would allow for the market to determine what would be the most economically efficient use of the zone. For both types of zones, the interests would probably have to be of long-term duration, i.e. a minimum of 20 years, to provide enough certainty for the buyer.

Dominant use zones could be vested in one individual, sector or group. For example, the government could decide to designate four types of dominant use zones: commercial fishing, oil and gas, seabed minerals, and conservation zones. The government could then decide whether the zone would be granted to the sector as a whole or auctioned to individuals. Given the existing ITQ market for fisheries and the mobility of these resources, it is most appropriate for the fishing dominant zones to

[215] Countries are not able to alienate the EEZ to private parties because they do not own it. International law grants nations "sovereign rights" to develop and conserve, but it does not grant sovereignty. In the United States, alienating the territorial sea would likely violate the public trust. See, Osherenko (2006).
[216] Guerin (2003), p.5
[217] Ibid. p. 14
[218] Hanna (1996), p. 43

vest in the entire fishing sector. For nonmobile resources such as minerals and oil and gas, it would be more appropriate to auction those zones to the highest bidder and have the property interest vest in one entity. Control over conservation zones could be granted to the environmental sector, i.e. a consortium of environmental NGOs.

A series of multiple use zones could also be created by auctioning off with no particular use set as the dominant use. An auction would be held for the zones and the winner of the auction would have the rights to that zone, subject to other laws and regulations.

This regime would not necessarily mean that all EEZ space would be auctioned. Government could choose to do that but given the uncertainties of a new "market" it would be prudent for most of the EEZ to remain unzoned. If, however, someone wanted to propose a use for an unzoned area then the government could choose to expand the zoned area via an open auction for that area, or decline to put additional zones in the market. If the government did not proceed this way, the market would be undermined because new users could go to the government instead of the marketplace.

It should be noted that under a private property regime Maori rights would need to be accounted for and respected. Given their legal rights and cultural interests, Maori would likely have a claim to at least a portion EEZ resources and the government income derived from them.

The zone rights holder would have the right to develop, exclude, and to sell. In a dominant use, the zone rights holder would be limited to developing that zone for the dominant use. Any development would also be subject to the relevant laws regulating that use. With some limited exceptions, such as rights to navigation and submarine cables, the zone rights holder would have the right to exclude other users.[219] The dominant zone rights holder could sell their right to another user but the zone would still be subject to the dominant use.

For a multiple use zone, the zone rights holder could develop the zone subject to the law and regulations for whichever use was pursued. A multiple use zone would permit but not require the rights holder to allow for multiple uses. If the uses conflict, the users' recourse would be to the zone rights holder (not the government) under whatever agreement the parties had signed amongst themselves.

The government could deny application for a use that did not comply with existing laws. The risk involved in the chance of government approval would ostensibly be addressed by the parties in their negotiations and reflected in the price. If there was a violation within the zone, the government could pursue both the user and the zone rights holder, and could revoke the zone rights. This means the zone holder would have an incentive to ensure user compliance. After the initial auction, the government would collect no rents or royalties; they would go to the rights holder.

[219] UNCLOS III, Part V, Article 58, Section 1 maintains all nations' right to freedom of navigation and the right to lay cable and pipelines in the EEZ.

The ITQ system of fishery management would stay in place, but the quota holders would have to respect the property rights of zone holders. There would be a layering of the ITQ system with the spatial rights of the zoning regime. If the fishing industry believed it did not have enough fishing dominant zones, it could purchase more rights in multiple use zones, either by purchasing the zone rights or by entering into agreements with the zone right holders.

The zones create an interest in real property and would have value in the marketplace. It is not clear, however, that anyone buy zones at a price that resulted in a "fair" return to the public. There would probably be a limited number of bidders, and the high level of uncertainty as to the benefits of purchase means the prices could initially be low. This woud leave the risk of valuation in a new market on the government, which means the public good could suffer.

This zoning regime would probably achieve greater market efficiency. By allowing zone holders to buy and sell their rights and enter into agreement about the use of the zones, the rights of use would end up in the hands of those who valued it most.

It is doubtful, however, that this sort of zoning regime would promote nonuse values, such as conservation goals or cultural values. For nonrenewable resources, the zone rights holder will have incentive to remove all the valuable resources if it can be done in a cost effective manner. The issue becomes how the resource is extracted and what the long and short-term effects are of the extraction. For example, the rights holder in a mineral rich zone such as a seamount may not be at all concerned with detrimental effects on biodiversity or on fish stocks. In the realm of renewable resources, the primary resource at issue for the foreseeable future is fishing stocks, and the ITQ system manages these resources. This zoning regime would not create any new incentives for sustainability that do not already exist.

***Advantages***

*Enables tradeoffs*. One of the main advantages of a private zoning approach is that it allows for tradeoffs between sectors on a direct basis. Negotiations can be conducted and terms reached without need for a government intermediary. This will lead to greater economic efficiency because the right to use the resource go to the individual who values it most economically.

*Increases innovation*. Markets reward innovation and this system would allow individuals to be rewarded for their innovation. For example, if someone develops technology to extract deep seabed minerals more affordably then they will be able to buy out the zone rights of less efficient mineral developers. Private parties in the marketplace are also very creative in structuring deals that are mutually beneficial to each party.

*Adaptable*. Democratic governments will never be as nimble or adaptable as markets because they are not designed to be. A private zoning regime allows for uses to change over time as market benefits change. If a zone being used for minerals becomes more marketable as a site for renewable energy development then the parties can enter into an agreement to change the use in a short period of time via buyouts.

*Sharing of compliance activities*. This regime would take some of the pressure off government for enforcement activities. The zone rights holder would have an incentive to ensure users' compliance or his rights to the zone could be revoked. Government would still have to do monitoring and compliance but incentives would exist for someone to share in that task. Many disputes or conflicts would be resolved between private parties. The retreat of government, however, can be problematic which leads us to the disadvantages.

***Disadvantages***

*Possible decrease in public good*. If government relinquishes some of its decision-making power to the marketplace then the general public interest may suffer because no one is looking to protect it. A market-based regime works on the principle that everyone looking out for their own best interest leads to the greatest economic good overall—Adam Smith's famous "invisible hand".[220] However, greatest economic good does not always equate to the greatest public good.

*Abrogation of trust responsibility*. Granting extensive privatised rights in the marine resources of the EEZ may be an abrogation of the trustee responsibility for the resource the government holds under national and international law.

*Lack of comprehensive view*. Even though the regime would allow for tradeoffs between sectors, each government ministry would continue to regulate the uses for which they were responsible. While the zoning regime would need some upfront strategic planning, the benefits of the market (such as adaptability, flexibility, innovation) are maximised if the market is allowed to work toward the greatest economic efficiency. This necessarily means that a comprehensive vision becomes difficult because it is the collective actions of numerous individuals that control the direction.

*Does not adequately account for non-use values*. Non-use and non-market values fare poorly in a market-based system.[221] There might be some incentives for conservation tourist zones, but the incentives would in all likelihood not result in conservation zones large enough to protect biodiversity To ensure that non-use values were protected, conservation, cultural or similar zones would need to be set aside as a first step in developing the zoning regime.

*High implementation costs*. Creation of a new system of private property rights in the EEZ would be costly. A new law would have to be passed, likely against strong opposition.[222] If the law passed there would be planning to be done, conservation zones to be created, numerous consultations with stakeholders, and then a process

[220] Smith (1991), Book IV, Chapter 2, p. 399. "As every individual, therefore, endeavours as much as he can both to employ his capital in the support of domestic industry, and so to direct that industry that its produce may be of the greatest value; every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention."

[221] Hanna (1996), p. 43

[222] See, Young (2007), who argues that zoning may be accomplished without new laws.

created to auction the zone rights. Creating an entire new market where one did not exist before would be a very large undertaking.

*Difficult to Undo.* Once property interests are created and purchased, they can be difficult to rescind or buy back. If the government decided that they no longer wanted a private property regime for the EEZ they might not be able to roll it back. This strategy will make adaptive management more difficult because it is predicated on the zone rights holders making many of the decisions.

*Does not address some important issues*. Zoning does not address non-spatial challenges, such as invasive species. Regulatory frameworks addressing those issues would still need to be maintained.

## Co-Management Mechanism for Improved Governance

Hardin outlined two solutions for the "tragedy of the commons": government intervention or privatisation.[223] As discussed in Chapter 2, it is now recognised that Hardin's proposed solutions were too limited. Many examples of successful management of common pool resources have been identified that do not involve government regulation or privatisation, but involve communities managing the resource themselves or communities working with government to manage the resource.[224] Co-management is government and communities working together. It is a "sharing of responsibilities, rights and duties between the primary stakeholders, in particular, local communities and the nation state; a decentralized approach to decision-making that involves the local users in the decision-making process as equals with the nation-state."[225] Examples of co-management exist along a continuum from government simply seeking extensive community consultation to government ceding decision-making.

### New Zealand Example of Co-management

Co-management as a governance regime can probably best be understood through a successful New Zealand example, the Fiordland Marine Guardians. In December 1995 a group of citizens in the Fiordland region created a group to address concerns about issues affecting Fiordland's fisheries and the marine environment.[226] The group believed that these issues could be resolved best at the local level.[227] They chose their members based on their commitment to the resource, their willingness to work with others, and the ability to invest time in the effort.[228] After years of work and with extensive stakeholder input, the Guardians finalised their Fiordland Marine Conservation Strategy in October 2003 and presented it to the Minister of Fisheries and the Minister for the Environment.[229] Following consultation, the Government, agreed to develop special legislation to give effect to the Conservation Strategy. The

[223] Hardin (1968)
[224] See Ostrom (1990)
[225] *Report from the International Workshop on Community-based Natural Resource Management (CBNRM), Washington DC, 10-14 May 1998*, p. 11
[226] Guardians of Fiordland's Fisheries & Marine Environment Inc (2003), p. 19
[227] Ibid.
[228] Ibid.
[229] Fiordland Marine Guardians Website, http://www.fmg.org.nz/index.php?p=story (Retrieved 16 April 2008.)

Fiordland (Te Moana o Atawhenua) Marine Management Act passed in 2005 with little opposition. The Act requires the relevant government agencies to take the Guardians' advice and recommendations into account when making decisions.[230] The Fiordland Marine Area is now co-managed by the government agencies and the Guardians.

Co-management is primarily envisioned as a strategy for resource management at the local level.[231] There are many lessons to be learned from these community efforts, but the extent to which these lessons can be scaled up to a commons the size of New Zealand's EEZ is an open question. Can co-management be used on larger scales or multiple scales, and transcend community-based management? In particular, is it a viable strategy for New Zealand's EEZ?

**Relevant Factors**

A co-management regime could theoretically be created for some of the EEZ. Government would most likely initiate the effort by calling for representatives from the various sectors to come together to discuss a co-management regime for a portion of the EEZ. The area proposed for co-management would probably be an area where the potential for conflicting uses is imminent or where uses will conflict with non-use values in sensitive areas. At the initial stakeholder meeting, the government would lay out the issues and the problems to be solved. If the participants were not willing to invest significant time and resources to resolve the problems in a collaborative fashion then co-management could not occur. Moving forward would entail determining the final participants, analysing the issues, defining the respective decision-making roles of government and private participants, determining information and capacity needs, and then developing strategies to manage the resource.[232]

But is it realistic for co-management to work in the EEZ? The social and ecological contexts of the EEZ do not lend themselves to co-management. Dietz et al note that community-based commons governance tend to be more effective when:

- Resources and use can be monitored;
- Rates of change (community, technology, economic conditions) are moderate;
- Communities have dense social networks;
- Outsiders can be excluded at relatively low cost; and
- Users support effective monitoring and rule enforcement.[233]

When applying these factors to the EEZ, it becomes apparent that co-management of this large, remote commons would face serious challenges.

***Can the resources be monitored?***

Use can be monitored, but monitoring the whole resource would be extremely difficult. Fishers have reporting requirements, those who mine and extract oil and gas are required to to self-monitor their activities, and people laying submarine cables

[230] Fiordland (Te Moana o Atawhenua) Marine Management Act 2005, Part 3, Section 26
[231] Berkes (2006), p. 45
[232] Carlsson (2005), pp. 73-74.
[233] Dietz (2003), p.1908

assess the linear stretch of where their cables will be laid. This monitoring of activities does not necessarily equate to having a sense of the health of the ecosystem as a whole. The EEZ is vast, many of the resources are mobile, and the resources are under hundreds of metres of water. There is still much to be learned about the ocean portion of our planet. Fortunately, there is a global wide effort to develop and implement a Global Ocean Observing System (GOOS) to improve the world's capabilities to monitor and understand the oceans. Given the vast size of the EEZs, there will be limits to how comprehensive monitoring could be. Some level of uncertainty will exist for the foreseeable future.

***Are the rates of change (community, technology, economic conditions) moderate?***

The current rates of change are generally moderate. Community changes will probably continue to be moderate for the foreseeable future. Technologies are always advancing, and depending on what is uncovered the economic situation can change rapidly, as it would if fishery stocks collapsed or there was a major oil and gas discovery. The aquaculture boom in the early 2000s is a New Zealand example of a situation where the rate of change outstripped the governance structure's ability to handle that change. If the rates of change accelerate then co-management becomes less viable as a governance strategy because local communities can find it difficult to adapt.

***Does the community have dense social networks?***

There is no "community" in the EEZ in the local, traditional sense.[234] Relevant stakeholders in the EEZ can certainly come together on a periodic basis, but their relationship will probably be limited to the EEZ. They do not have the physical proximity of a traditional community. This matters immensely. It is difficult to link social and ecological systems if the social part of the system is diffuse.

A "sense of place" or "place attachment" also affects community involvement. A relationship based on a resource 12 nautical miles or more out to sea is profoundly different than a shared "backyard." A sense of place will be stronger to a community-based resource than to the EEZ because this sense of place is developed through personal, group and cultural processes.[235] A shared community resource supports economic interests in the community in a very direct way. People will have a much stronger sense of place in relation to the resources where they boat, swim, fish, and snorkel than in the remote resources of the EEZ.[236] Place attachment may be particularly important in a co-management regime because a sense of place fosters social and political involvement in its preservation.[237]

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[234] Thomas Bender defined community thus: "A community involves a limited number of people in a somewhat restricted social space or network held together by shared understanding and a sense of obligation. Relationships are close, often intimate, and usually face to face. Individuals are bound together be affective or emotional ties rather than by a perception of individual self-interests. There is a 'we-ness' in a community; one is a member." Bender (1982), pp 7-8. See also, Fabricius (2007), p. 30 where it is acknowledged that the concept of community is "fraught with problems."

[235] Vorkinn (2001), p. 252

[236] See Vorkinn (2001), p. 252 who states that attachment to place "may vary according to scale and tangibility (for example, a specific geographical area vs. wilderness areas in general)."

[237] Mesch (1998), p. 505

Even though EEZ stakeholders are not a traditional community, can they as a non-traditional community fulfill that component of a co-management regime? It has been suggested that today a community need not be locally-based, and that physical proximity is not as important as it used to be.[238] The age of the internet is leading to virtual communities defined by shared interests where physical proximity is irrelevant. It is doubtful, however, whether a coherent EEZ community could be created and sustained because it would not be voluntary and it would not have all the key structural features of community.

Many virtual communities are voluntary communities that are based on personally-chosen, shared interests. Voluntary communities have three defining conditions: "low barriers to entry, low barriers to exit, and interpersonal relations shaped by mutual adjustment rather than hierarchical authority or coercion."[239] A virtual community based on governing an EEZ would not be likely to have representatives from all the relevant sectors eager to voluntarily join. They would join to protect their sectors' interests during the process, which could be seen as a form of coercion.

An EEZ virtual community would not have the key structural features of community, which are limited membership, shared norms, affective ties, and a sense of mutual obligation.[240] It is conceivable that it could have limited membership, develop shared norms, and possibly have affective ties, but would probably not have a sense of mutual obligation. Mutual obligation requires that the members identify with each other to such an extent that they are willing to sacrifice on each other's behalf.[241]

***Can outsiders be excluded at relatively low cost?***

Outsiders can be excluded at relatively low cost because the remoteness and difficulties in extracting EEZ resources provide a practical barrier. There are significant capital requirements for extracting resources from the EEZ. Individuals or businesses will not invest this capital unless they have government approval. This gives government the opportunity to act as gatekeeper and exclude other members from entering into the co-management group.

***Do users support monitoring and enforcement?***

EEZ users would not be opposed to monitoring and enforcement but whether they would actively engage is unclear. The users of EEZ resources are generally a sophisticated group. They are commercial fishers or large companies developing oil, gas and minerals, or laying submarine cables. Other than recreational boating and fishing, the use of EEZ resources by the average person is limited. Users understand that monitoring and enforcement are a necessary part of the regulatory regime. They want the regulations to be clear, fair, and consistent.

It is doubtful whether EEZ users would actually perform the task of monitoring and enforcement of each other. In many instances of community-based management of a common pool resource, the monitoring and enforcement is performed by or provided

[238] Ibid. p. 517. See also, Wellman (2001), p. 2032
[239] Galston (2000), p. 195
[240] Ibid. p. 197
[241] Id. p. 200

for by the users themselves. This type of community monitoring is likely to be too difficult in the EEZ context.

In sum, the factors that lend themselves to successful co-management regimes show some distinct deficiencies in the EEZ context. The rates of change are moderate right now and probably will be for a while. Outsiders are not a significant pressure and could be excluded. Monitoring and enforcement can be done but it will be reliant on a great deal of self-monitoring. The largest hurdle to co-management as a viable governance regime in the EEZ context is the lack of community. If a community does not exist for the government to partner with then co-management is probably not a realistic option.

**Advantages**

*Comprehensive and integrated*. A co-management regime focused on a place (as opposed to a single resource) is a comprehensive and integrated form of management. It integrates the government agencies, the different sectors, and the stakeholders to work together toward shared goals. This integration is realised because the focus is on the place as opposed to the various uses being managed separately. It links groups and organisations that otherwise would not be linked.[242]

*Reduces conflicts*. These regimes are by their nature cooperative because the stakeholders work together and the process takes all significant uses and non-uses into account. The integration of co-management regimes also allows for the sharing of information and creates a forum for ongoing dialogue.[243] This provides the opportunity for issues to be addressed before they become full-blown conflicts.

*Increases efficiency*. Co-management shares the workload. Decision-making and actions do not all fall to government. This division of labor can increase efficiency because it enables specialisation tailored to the task. [244]

*Improved informational exchange*. The cross-sectoral nature of co-management regimes aids the exchange of information and resources.[245] The parties in a co-management regime bring specialised knowledge and strong relationships within their respective sectors to the table. Government agencies can provide technical, scientific and monetary resources. Each participant benefits from what the others bring to the table. Co-management can make the whole greater than the sum of the parts.

*Enables tradeoffs*. Co-management allows for tradeoffs between sectors, and between uses and nonuse values. They occur at the planning and strategic levels. This provides the opportunity for balance, and recognises the full suite of societal values.

*Adaptable*. A co-management regime is adaptable because it creates a process for integrated ongoing decision-making. This process allows for new information to be shared, discussed and acted upon.

[242] Carlsson (2005), p. 72
[243] Ibid.
[244] Ibid. p. 71.
[245] Ibid. pp. 71-72

*Inclusive process*. Co-management is an inclusive process, far removed from a centralised command-and-control approach. Government and stakeholders agree on what to do together. This inclusive process builds buy-in from all the various stakeholders, which can foster high-level political support.

*Reduces long-term costs*. While co-management does involve a significant investment of time, effort and resources for start up, ongoing transaction costs should be reduced.[246]

**Disadvantages**

*Consensus may not be reached*. Assuming the significant hurdle of the potential lack of community (discussed above) could be overcome, co-management has its disadvantages. There is no guarantee of success. The stakeholders and government agencies could come together, invest a lot of time and effort in a multi-year process but no consensus would be reached. The issues may be difficult to resolve or there may be strong vested interests in the status quo.[247] If just one significant sector withholds support then the whole effort may fail.

*May avoid tough decisions*. Consensus decision-making can avoid the tough decisions so the final agreement is the lowest common denominator among all the stakeholders. This means the thorniest but most-pressing problems are not addressed. Deferred problems can escalate into environmental crises, which is what co-management seeks to avoid.

*Influential leaders required*. Co-management is dependent on strong political leadership in the community.[248] There must be strong leaders within the different sectors helping to shape the future and gain the buy-in from the members of their sectoral community.[249] There must be community buy-in for co-management to work and it is the political entrepreneurs that broker that buy-in. Without these leaders from within the various sectors, co-management will likely fail.

*Difficult to align expectations*. Government and stakeholders may not share the same understanding of their respective roles. Governments may envision the stakeholders as an advisory body and not management partners. A lack of agreement concerning roles could result in damaging misunderstandings. If government tries to maintain the ultimate decision-making authority, the stakeholders may become disenfranchised or treat the government agencies as antagonists instead of partners.[250] Co-management only works if the participants understand and agree as to their respective roles.

[246] Carlsson (2005), p. 72
[247] Beem (2007), p. 541
[248] Olsson (2004), p.83
[249] Beem (2007), p. 545
[250] Ibid. p. 547

# 4 CONCLUSION

Governing the marine environment is complicated. The social and political aspects are complex, and the biophysical environment is not completely understood. Respecting both aspects of social-ecological systems is difficult. And there are numerous strategies to choose from to address the governance strategies. It is imperative, however, to try.

Considering the number of possible strategies and the complexities of governance, both New Zealand and the United States must become comfortable with the idea of environmental management as experiment.[251] We need to move past our history of environmental laws being one size fits all. Governments will have to try different strategies in different contexts. Communities will have to engage. We need to expect less than ideal results. As long as we learn from our mistakes and seek to correct them, trying a strategy and failing should be acceptable.

Given the complexities of managing social-ecological systems, it will not be one strategy that achieves success, but a number of different strategies working together. There are no panaceas. The strategies discussed in this report are not mutually exclusive, and a mix of some of them will likely be the most effective in improving governance of the marine commons over the long-term.

That said, it is advisable that EEZ governance in the future should have a strong spatial component, such as marine spatial planning or ocean zoning without property interests. A spatial component to governance does not obviate the need for regulation of activities, but it can help to allocate space in a rational way so all societal needs and values can be taken into account.

Where feasible the co-management strategy provides the best opportunity for governing social-ecological systems. To have integrated governance of social-ecological systems, the people using and wanting to conserve the resources must be involved in the decision-making. Co-management is democracy in action in the environmental context.

Co-management, however, cannot be forced. It is a strategy based on collaboration and mutual obligation. Government can convene the process but if the participants are unwilling then co-management will probably fail. Given the lack of a local community, it is doubtful co-management could work in the EEZ.

Implementing any of the strategies discussed in this report will not be easy, but the attempt must be made because the oceans are under threat. New Zealand is trying to improve management of the EEZ by proposing new legislation to regulate environmental effects and address cumulative effects. It is a good start. Improving governance will not be easy, but strategies do exist to move forward.

[251] Holling (2001), p. 393. See also, Ludwig (1993), p. 36

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