

Spatial Planning for the Gulf

An international review of marine spatial planning initiatives and application to the Hauraki Gulf



Hauraki Gulf Forum
Tikapa Moana

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The Hauraki Gulf Forum is a statutory body charged with the promotion and facilitation of integrated management and the protection and enhancement of the Hauraki Gulf. The Forum has representation on behalf of the Ministers of Conservation, Fisheries and Maori Affairs, elected representatives from Auckland Council (including the Great Barrier and Waiheke local boards), Waikato Regional Council, and the Waikato, Hauraki, Thames Coromandel and Matamata Piako district councils, plus six representatives of the tangata whenua of the Hauraki Gulf and its islands.

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This material is intended as general guidance. The guide is not a substitute for proper professional advice where that is needed. It does not purport to provide definitive legal interpretations, nor should it be regarded as doing so. The guide should not be regarded as official government policy.

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Foreword

The Hauraki Gulf Forum commissioned this international review of marine spatial planning to help inform and shape the way we approach future management of the Hauraki Gulf.

It continues the series of publications produced to guide the application of the Hauraki Gulf Marine Park Act 2000.

The Hauraki Gulf Marine Park recognises the national significance of the waters, islands and coastal area east of the Auckland and Waikato regions and requires an integrated response by management agencies aimed at protection and enhancement.

State of the environment reports prepared by the Hauraki Gulf Forum in 2005, 2008 and 2011 show the large scale transformation of the Gulf over two lifetimes and declines in several important areas of environmental health.

The management objectives of the Hauraki Gulf Marine Park Act provide a framework to reverse these trends and ensure a healthy, productive ecosystem that optimises benefits from conservation, recreation, cultural and economic use.

The Act's principles mirror those used to frame marine spatial planning exercises elsewhere around the world.

The Forum approved this report for publication in April 2011 for reference and use by its constituent parties and looks forward to involvement in the scoping and development of a spatial plan for the Hauraki Gulf Marine Park/ Ko te Pataka kai o Tikapa Moana.



Mayor John Tregidga, Chair, Hauraki Gulf Forum

1 Introduction

The Hauraki Gulf Marine Park Act 2000 (HGMPA) seeks to better integrate and improve management of the Gulf. It emphasises the importance of sustaining the life-supporting capacity of the coastal marine area and islands of Tikapa Moana (the Hauraki Gulf). It provides an overarching, principle based framework for spatial planning in the Gulf.

In 2009 the Hauraki Gulf Forum released a publication titled *Governing the Gulf: Giving effect to the Hauraki Gulf Marine Park Act through policies and plans*. The purpose of the publication was to identify how the provisions of the HGMPA could be given effect to in policies and plans prepared under the Resource Management Act 1991 (RMA).

The Guide recommended that regional policy statements and regional coastal plans identify, spatially where possible, significant interrelationships and elements which can contribute to the ecological health and productivity of the Gulf's coastal marine area and islands.¹

Marine spatial planning is an approach which focuses on the marine area as an integrated system and which, within this system, seeks to spatially identify the location of important values and resources and areas appropriate for different human activities.

Since the release of *Governing the Gulf* there have been significant institutional and policy changes affecting the management of the Gulf. A new unitary authority for the Auckland region, the Auckland Council, was established on 1 November 2010. The Auckland Council is required to prepare and adopt a spatial plan for the Auckland region under the *Local Government (Auckland Council) Act 2009* (as amended in 2010). The coastal marine area comprises almost 70 per cent of the Auckland region and therefore will be an important component of the spatial plan.

In November 2010, the Minister of Conservation released a revised New Zealand Coastal Policy Statement (NZCPS) which came into effect on 3 December 2010. This provides stronger direction on how councils are to manage the coastal environment, including requiring the spatial identification of important elements. The new provisions are to be given effect to by councils "as soon as practicable".

Government has also promoted changes to the legal framework applying to aquaculture through the Aquaculture Legislation Amendment Bill (No 3) which was introduced into Parliament during November 2010. The amendments are intended to facilitate growth of the aquaculture industry, through freeing up marine space, and diversifying into higher value species.

All these developments strengthen the need to apply a marine spatial planning framework to the Gulf.

In November 2010, Environment Waikato notified its proposed regional policy statement. The document sets out the council's intention to adopt a more collaborative approach to managing the Hauraki Gulf (as well as other key areas) including:

- Investigating opportunities for joint initiatives (including across regional boundaries) particularly in relation to managing the Hauraki Gulf (paragraph 4.2.4(c))
- Advocating for the Hauraki Gulf Forum to play an active role in management, research, advocacy and education in relation to the Hauraki Gulf and its catchments (paragraph 4.2.9(b))
- Liaising with relevant Forum partners and other stakeholders to investigate the preparation of a spatial plan for the Hauraki Gulf (paragraph 4.2.9(c))

Marine spatial planning is being applied in many countries around the world. The purpose of this report is to distill the approaches and learnings from this international experience in order to inform the application of marine spatial planning within the Hauraki Gulf.

Part One of the report summarises the results of an international review undertaken of marine spatial planning initiatives and describes how marine spatial planning might be applied to the Hauraki Gulf. It concludes with a set of conclusions and recommendations for the way forward. Part Two of the report contains a more detailed description of the marine spatial planning processes undertaken in each of the eight case study areas.

PART ONE: OVERVIEW

2 Overview of marine spatial planning

What is marine spatial planning?

Marine spatial planning is an approach designed to provide greater direction on how defined areas of marine space, including coastal and offshore areas, are to be managed in order to meet desired societal outcomes. A range of definitions have been proposed for this approach.

Jane Taussik, in her article about the opportunities of spatial planning for integrated coastal management, describes the concept of spatial planning which can be applied equally to the land and the sea:²

Basically, it is about 'what goes where.' ... It can be used to apply to any activity with a spatial, or geographical, dimension, be it on land or in the marine environment, and concerns where a particular activity or development can be undertaken. Its tools include zoning, which can be combined with temporal controls. Coastal/marine activities demonstrating spatial dimensions include: new development; nature conservation; coastal defence and shoreline management; the regulation of minerals on and off shore; and fisheries.

In their 2009 step-by-step guide to marine spatial planning, Charles Ehler and Fanny Douvère include the following description sourced from the United Kingdom Department for Environment, Food and Rural Affairs:

Marine spatial planning (MSP) is a practical way to create and establish a more rational organisation of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect marine ecosystems, and to achieve social and economic objectives in an open and planned way.

The USA Interagency Ocean Policy Task Force proposed a more comprehensive definition in its *Interim Framework for Effective Coastal and Marine Spatial Planning* released in December 2009:

CMSP [Coastal and Marine Spatial Planning] is a comprehensive, adaptive, integrated, ecosystem-based, and transparent spatial planning process, based on sound science, for analyzing current and anticipated uses of ocean, coastal, and Great Lakes areas. CMSP identifies areas most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security, and social objectives. In practical terms, CMSP provides a public policy process for society to better determine how the oceans, coasts, and Great Lakes are sustainably used and protected now and for future generations.³

In a paper published online during February 2010 in *Marine Policy*, a group of 21 scientists posited the following definition, which focuses on using marine spatial planning as a tool to implement ecosystems-based management:

*Ecosystem-based MSP [marine spatial planning] is an integrated planning framework that informs the spatial distribution of activities in and on the ocean in order to support current and future uses of ocean ecosystems and maintain the delivery of valuable ecosystem services for future generations in a way that meets ecological, economic, and social objectives.*⁴

Marine spatial planning involves taking a strategic and forward-looking approach to the management and use of marine space. It focuses on managing conflicts between human activities and the marine environment (such as dredging and benthic habitats) as well as between competing marine uses (such as fishing and aquaculture). It identifies both future opportunities and threats. It can also inform management of interactions across the land-sea interface and provide for inclusion of tangata whenua values.

Application of marine spatial planning

One of the earliest applications of marine spatial planning was to assist with the management of marine protected areas. The first spatial plan for Australia's Great Barrier Reef Marine Park was developed in the early 1980s. It identified a number of marine zones where a different range of activities could take place. A similar approach was applied to the Florida Keys National Marine Sanctuary during the 1990s where a comprehensive management plan, including zoning, was developed.

During the early 2000s, Australia and Canada laid the foundations for applying marine spatial planning to large bioregions, which extended out to 200 nautical miles from the shore. While the original intention in both cases was to develop comprehensive zoning plans, this proved difficult in practice, and the main tangible output has been the identification of candidate areas for marine protection.

Marine spatial planning has more recently focused on the management of conflicts between competing marine activities, particularly in the heavily congested marine areas of Europe. Belgium has been progressively implementing a Master Plan for its portion of the North Sea since 2003, the Netherlands developed an overarching spatial planning framework for its North Sea area in 2005 (and revised it in 2009), and in 2008 Germany finalised a spatial plan for its exclusive economic zone.⁵

These European planning processes were largely prompted by the need to better manage growing demands from new ocean uses, such as wind energy and aquaculture, as well as the need to implement European Union directives on nature conservation.

The European Commission is promoting the adoption of marine spatial planning as “a stable and transparent way to improve the competitiveness of the EU maritime economy and to deal with complex trans-national issues such as the effects of climate change.”⁶

There has been a recent high level initiative in the USA, supported by President Obama, to implement marine spatial planning nationwide. Similar to the approach taken in Australia and Canada, marine spatial planning is to be applied to large marine ecosystems. The spatial plans will identify:⁷

“Areas most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security and social objectives.”

The United Kingdom *Marine and Coastal Access Act 2009* provides a legal framework for spatial planning in that jurisdiction. This includes the development of a marine policy statement and a series of regional marine plans covering coastal and offshore areas. Most licencing decisions are required to be made in accordance with these documents.

Marine spatial planning is a well-accepted approach to assist with managing marine areas. The European Union financed the preparation of a *Handbook on Integrated Marine Spatial Planning* in 2008 and *Marine Spatial Planning: A Step-by-Step Approach Towards Ecosystem-based Management* was produced under the auspices of UNESCO in 2009.

Potential benefits of marine spatial planning

A review of European experience, published in 2009, identified that the purposes (and benefits) of applying spatial planning to the marine environment, include:⁸

- Application of an **ecosystems approach** to the management of human activities through safeguarding important marine ecological processes and the overall resilience of the marine system
- Provision of a **strategic, integrated and forward-looking** framework for all uses of the sea which takes into account environmental as well as cultural, social and economic objectives
- **Identification, conservation or restoration** of important components of coastal and marine ecosystems
- **Allocation of space** in a rational manner which minimises conflicts of interest and maximises synergies across sectors
- Management of **cumulative impacts** over space and time

- Provision of **greater certainty** for marine users

Marine spatial planning can also help create a better linkage between science and management. The process of mapping physical and ecological information involves the collation and application of existing data to relevant management issues. It also enables information gaps to be identified and future research to be prioritised.

These purposes and benefits are consistent with those contained within the Hauraki Gulf Marine Park Act 2000 (see Appendix 1). These include integrated management of the Gulf (section 3(a)), protection and enhancement of life-supporting capacity of the Gulf's environment (section 8(a)), and protection and enhancement of the Gulf's resources (section 8(b)).

3 Summary of experience in other jurisdictions

A review of the development of marine spatial plans in other jurisdictions has been undertaken in order to inform the potential application of marine spatial planning to the Hauraki Gulf. Prospective case study areas were identified through a web-based search of spatial planning initiatives and an international literature review. Eight case study areas were selected for further investigation. They included a range of countries (Australia, USA, Canada, Belgium and Norway) and applications (marine protected areas, large marine systems and coastal areas).

The recent initiatives in the United Kingdom and at the federal level in the USA were not included, as they were in the very early stages, and had not yet progressed to the development of spatial plans.

The marine spatial planning projects included in the review are:

- *Great Barrier Marine Park Zoning Plan* which was first developed in 1982 and comprehensively revised in 2004
- *Florida Keys Marine Sanctuary Comprehensive Management Plan* which was developed in 1996 and revised in 2007
- *Australian bioregional marine planning* which is undertaken at the Commonwealth level and is still ongoing, with the first plan for the south-east region completed in 2004
- *Eastern Scotian Shelf Integrated Oceans Management Plan* which was completed in 2007
- *Massachusetts Ocean Plan* which was completed in December 2009
- *Rhode Island Ocean Special Area Management Plan* which was completed in October 2010
- *Belgian North Sea Master Plan* which has been under development since 2003 and with Phase Two becoming operational in 2005
- *Barents Sea-Lofoten Islands Integrated Management Plan* (Norway) which was completed in 2006

Information on each planning process was obtained from web-based reports and relevant published articles. The selection of case study areas was, of necessity, biased towards English speaking countries due to the greater availability of English written material in these cases.

A detailed description of each case study is contained in Part Two of the report. The description includes the legal framework for the spatial plan, how the plan was prepared and what the plan contains. Where information was available, case studies also include a description of provision

for traditional use and management and lessons learnt. A synthesis of this material is summarised in Figure 1 and described in the sections below.

Size of planning area

The size of the planning area differed significantly between the case study areas. The Belgian North Sea master plan covered only 3,600 square kilometers, whereas at the other extreme, the Australian south-east bioregional plan extended across two million square kilometers of ocean.

The size of the planning area does not appear to have played any role in the ability to complete a marine spatial plan. The area covered by the most detailed spatial plan (the Great Barrier Reef Marine Park zoning plan) is similar to that of the initiative which failed to develop a spatial plan at all (the Eastern Scotian Shelf integrated management plan). The diversity in geographic scope of the case study projects indicates that marine spatial planning can be applied to very different scales.

Regulatory framework

All of the case study planning initiatives were undertaken within some form of statutory framework. Where the plans were specifically provided for in legislation, the legal provisions typically identified the overall purpose of the plan, its general content, and its linkage to management decision-making.

Management and advisory bodies

All the case study planning initiatives were led by government Ministers, agencies or regulatory bodies. Most were also advised by multi-sectoral advisory groups, typically including a mix of government, science, conservation and user groups. These included:

- Social, Economic and Cultural Steering Committee (Great Barrier Reef)
- Sanctuary Advisory Council - 20 members from a range of user, conservation, scientific and educational organisations (Florida Keys)
- National Oceans Advisory Group - 20 members from industry, science and conservation interests (Australian bioregional plans)
- Stakeholder Advisory Council – 32 members from wide range of conservation and community groups, academics, government agencies, Aboriginal peoples and user sectors (Canadian Eastern Scotian Shelf)
- Ocean Advisory Committee – 17 members including representatives of government agencies, user and environmental organisations (Massachusetts)
- Ocean SAMP Stakeholder Group – 49 members representing councils, academics, user and conservation groups (Rhode Island)

FIGURE 1 SUMMARY OF INTERNATIONAL REVIEW OF MARINE SPATIAL PLANNING INITIATIVES

Project	Size of area covered (km ²)	Management authority	Regulatory framework	Date of plan	Spatial element	Indigenous peoples
Hauraki Gulf Marine Park	13,900	Hauraki Gulf Forum (through the statutory powers of its members)	Hauraki Gulf Marine Park Act 2000			Relationships of tangata whenua with the Gulf recognised in the HGMPA Six iwi representatives on the Hauraki Gulf Forum
Great Barrier Reef Marine Park zoning plan	345,400	Great Barrier Reef Marine Park Authority	Great Barrier Reef Marine Park Act 1975	1984 and 2004	Comprehensive zoning plan with 8 zones	Access to all marine areas maintained for non-extractive purposes Traditional Use and Marine Resources Agreements
Florida Keys Marine Sanctuary comprehensive management plan	9,500	National Oceanic and Atmospheric Administration	Florida Keys National Marine Sanctuary and Protection Act 1990	1996 and 2007	Partial zoning plan with 5 zones and large bulk of marine area unzoned	
Australian South-east bioregional plan	2,000,000	National Oceans Office (within the Department of Environment, Water, Heritage and Arts)	Environment Protection and Biodiversity Conservation Act 1999	2004	Identification of candidate marine protected areas	Preparation of Sea Country Plans
Eastern Scotian Shelf integrated management plan	325,500	Fisheries and Oceans Canada	Oceans Act 1997	2007	Nil	Included on Stakeholder Advisory Council and Forum

Massachusetts ocean plan	6,859	Secretary of Energy and Environmental Affairs (Office of Coastal Zone Management)	Massachusetts Oceans Act 2008	2009	Creates 3 management areas, the largest which is multi-use with activities subject to siting and performance standards	
Rhode Island ocean special area management plan	3,800	Rhode Island Coastal Resources Management Council	Coastal Zone Management Act 1972 (federal)	2010	Partial zoning identifying 3 types of areas – Renewable Energy Zone; Areas of Particular Concern; and Areas Designated for Preservation	
Belgian North Sea master plan	3,600	Federal Minister	Act on the protection of the marine environment under Belgian jurisdiction 1999	2004 (Part 1) and 2005 (Part 2)	Partial zoning for sand and gravel extraction, future offshore wind energy projects, and marine protected areas	
Norwegian Barents Sea-Lofoten Islands integrated management plan	1,400,000	Ministry of the Environment	Oceans Resources Act 2008	2006	Partial zoning delineating 3 types of areas where petroleum activities can and cannot take place	Sami Parliament

For the Rhode Island Oceans Special Area Management Plan, technical advisory committees were also established for each chapter of the plan. These included scientists but also government agency representatives and stakeholders. The committees focused on refining the content of each individual chapter. For the Eastern Scotian Shelf project a Forum was established in addition to the Stakeholder Advisory Council. This was a broad-based assembly of stakeholders which met twice a year.

Methodology

Elements of the plan development process, common to many of the initiatives, included:

- Identification of goals, principles and/or strategies to guide the process
- Collation of spatial information on the marine environment
- Bioregionalisation of the planning region
- Identification of ecologically important and sensitive areas
- Collation of spatial information on human uses of the marine environment
- Spatial analysis of compatibilities and conflicts
- Consideration of management approaches and options
- Identification of spatial management areas
- Finalisation of the plan
- Implementation of the plan
- Evaluation and monitoring

In the GUAFRE project, a group of academics developed scenarios for the future use of the Belgian North Sea, based on schematic structural maps. This was an innovative attempt to apply land-based strategic planning approaches to the sea.

A GIS system was at the heart of most of the planning processes described, as this allowed different datasets to be spatially mapped and overlain where necessary. The GIS approach also enabled various proposed zones or protected areas to be mapped, in an iterative fashion, and for impacts on existing users and the marine environment to be identified and evaluated.

Public involvement

All the case study initiatives included extensive public involvement. Mechanisms used to engage the public in the planning process included:

- Involvement in advisory groups (described above)
- Workshops on specific issues
- Community meetings and drop-in sessions
- Written submissions on plan proposals

Because of the spatial focus of the process, maps were included in the public submissions received. For example, the Great Barrier Reef Marine Park Authority received around 6,000 detailed maps as part of the submission process for the Park plan, and devised a process to capture this information on the project's GIS system.

Role of science

Scientific information played a key role in the development of all the plans examined. In many cases a scientific advisory group was established to identify and scrutinise relevant scientific data. Such groups included:

- Independent Scientific Steering Committee (Great Barrier Reef)
- Oceans Policy Science Advisory Group (Australian bioregional plans)
- Science Advisory Council (Massachusetts)
- Science Advisory Task Force (Rhode Island)

For the preparation of the Massachusetts ocean plan, a Habitats Work Group was established to identify, characterise and rank priority areas for marine life and habitat. The Group met approximately weekly, over a three month period, to discuss data.

As well as informing the development of the plan, science advisors can identify gaps in knowledge and future research priorities. A science research agenda is to accompany the Rhode Island Oceans Special Area Management Plan. The Oceans Policy Science Advisory Group, established to oversee Australian bioregional plans, released a national framework for marine research and innovation in 2009.

During the development of the Norwegian Barents Sea-Lofoten Island Integrated Management Plan, a conference was held, where all the scientific work was discussed in plenary and workshop sessions. The results of the conference were then published and made publicly available. This enabled the science, on which the plan was based, to be thoroughly scrutinised.

Spatial contents of plans

The only project to result in comprehensive zoning of the entire planning area was the Great Barrier Reef Marine Park Plan. Unlike the other plans examined which are more recent, this plan had been under development for over 20 years.

Other initiatives focused on identifying ecologically important and sensitive areas, and in some cases, spatially planned for one or two significant new activities such as wind farms or petroleum exploitation. The spatial content of the plans was as follows:

- The *Great Barrier Reef Marine Park Plan* has eight zones covering the entire area of the park. These are accompanied by rules which determine what activities can take place in each zone.

- The *Florida Keys Marine Sanctuary Comprehensive Management Plan* identifies five zones within a much larger unzoned area – wildlife management areas; ecological reserves; sanctuary preservation areas; special-use areas; and existing management areas.
- The *Australian Bioregional Marine Plans* identify the spatial layout of the area and candidate marine protected areas.
- The *Eastern Scotian Shelf Oceans Management Plan* ultimately resulted in no plan as such or spatial delineations.
- The *Massachusetts Ocean Plan* includes three types of management areas – prohibited, renewable energy (where wind farms are permitted) and multi-use which is open to most activities. Management in the multi-use area is based on siting and performance standards which are linked to maps of natural resources and existing uses.
- The *Rhode Island Oceans Special Area Management Plan* identifies three broad zones within the broader marine area – a renewable energy zone which is the preferred site for large-scale wind farms; areas of particular concern which must be avoided where possible; and areas designated for preservation where most development is prohibited
- The *Belgian North Sea Master Plan* identifies three main zone types within a larger unzoned area – areas where sand and gravel extraction can take place; a zone for offshore wind farms; and delineation of marine protected areas

Provision for traditional use and management

In the main, there was poor integration of the interests of indigenous peoples into the marine spatial planning initiatives reviewed. The greatest progress made in this area, was in Australia, where the development of *Sea Country Plans* by Aboriginal groups has been piloted. These plans enable Aboriginal groups to proactively identify objectives and strategies for their ongoing involvement in marine management decision-making.

In British Columbia, First Nations have been actively involved in “integrated marine use planning” since 2005. The resultant community marine use plans are intended to “establish clear guidelines and best practices for activities occurring within ... respective traditional territories. These will ensure that the communities’ interests will be incorporated into future management decisions.”⁹

Monitoring

The Rhode Island Oceans Special Area Management Plan process was the most thorough of those examined in designing an ongoing monitoring process. The plan will be accompanied by a *Progress Assessment and Monitoring Process*. This monitoring plan will “record decisions, capture lessons learned, note achievements, and document policy and management adaptations. The process will be

“ongoing, available on the project web sites, and formally reported to the public on a biannual basis”. The oceans plan itself will undergo a major review every five years.

In order to maintain ongoing stakeholder engagement, during the implementation of the Rhode Island plan, an *Ocean SAMP Public Forum* is to be held every two years. The Forum will highlight projects underway, report on new research findings, review progress towards goals and objectives and recognise contributions to the plans implementation. The Forum will also address emerging issues and identify any needed changes to the plan.¹⁰

Lessons learnt

There are a number of lessons which can be learnt from experience in other jurisdictions and which can help inform the design of any potential marine spatial planning initiative undertaken within the Gulf:

- *Involve all management agencies early on* – in the Australian south-east marine bioregional planning process, the Commonwealth government initiated the process and then had difficulty bringing the state governments on board.
- *The agency leading the process should not have strong links with sectoral groups* – one of the difficulties in achieving a successful conclusion for the Eastern Scotian Shelf project, appears to have been the close links that the Canadian Department of Fisheries and Oceans had with the fishing industry, which had a strong vested interest in maintaining the status quo.
- *Establishment of clear expectations on what the plan will deliver and how it will add value* – it is important that stakeholders are clear from the beginning on the purpose of the plan, its scope, what it will consist of, how it will be implemented and what effect it will have. This helps engender trust and commitment throughout the process.
- *Development of clear principles to guide the spatial planning process* - this was identified as a key element of the successful process to develop the Great Barrier Reef Marine Park Plan. In the Australian south-east regional planning process, clear principles or objectives were not established at the outset, and this resulted in an unfocussed data gathering process which was poorly linked to management outcomes.
- *Indigenous values have at times been included* – while spatial planning can encompass tangata whenua values, there is not a lot of guidance from international examples of how this should be implemented
- *Early involvement of users of the marine area* – so that their interests and values are well-recognised and so that the plan can address potential future activities
- *Well-designed public process* – which includes public input into strategic, as well as detailed, planning decisions. Some groups may need resourcing so that they are able to participate fully. Many stakeholders will need to be educated about the issues. It is also important to obtain public input in a manner which can be incorporated into GIS-based planning systems.

- *Undertaking bioregionalisation* – which involves classifying the planning area into a number of ‘bioregions’ based on similar characteristics (such as habitats, communities and physical features). The classification can then be used as the basis for identifying planning units. Robust bioregionalisation was identified as a key contributor to the success of the Great Barrier Reef planning project.
- *Data analysis will not in itself produce a marine spatial plan* – experience indicates that scientists and planners need to work closely together, to ensure that data informs the development of the plan, but does not drive it.
- *There is never perfect information* – acknowledge that there are information gaps, and that the plan can be improved over time, but it is important to get started.
- *Consensus may not be achievable* - the only initiative studied which endeavoured to apply a stakeholder-led collaborative model to plan development, the Eastern Scotian Shelf project, failed to produce a spatial plan after eight years of negotiations. This highlights the difficulty of achieving consensus in areas where there are significant vested economic interests.

The planning *process* itself can have considerable benefits. These include the mobilisation of scientific effort to better understand the marine environment; better integration of scientific information into the decision making process; stakeholders gaining improved knowledge of marine management issues and a better understanding of each others’ points of view; and management agencies developing greater expertise in integrated marine planning and management approaches.

4 Application to Hauraki Gulf

The Hauraki Gulf Marine Park spans some 13,900 square kilometers of sea. It comprises a semi-enclosed shallow coastal area, studded with islands, and fringed with numerous harbours, bays and spits. Water depths range from the shallow estuarine area in the Firth of Thames, with average depths of less than two metres, to the outer Gulf where average depths increase to 85 metres.¹¹

The Gulf includes a wide diversity of marine environments including estuaries, sandy beaches, rocky reefs, kelp forests, seagrass beds, coral, sponge gardens, shellfish beds and mangroves. It has a rich diversity of marine species which include:

- Numerous species of fish. For example, 80 species of fish have been recorded in the coastal waters off north-eastern Great Barrier Island.¹²
- Numerous species of shellfish and invertebrates. For example, a survey which only included *intertidal sites* within the Gulf identified 728 species with the most diverse site being at Home Bay on Mototapu Island where 179 species were found.¹³
- Twenty-three species of seabird which breed in the Gulf, with a further 25 species visiting.¹⁴
- At least six species of cetaceans including resident Bryde's whales and schools of up to 150 common dolphins. Less commonly sighted species include bottlenose dolphins, orcas, long-finned pilot whales and Arnoux's beaked whales.¹⁵
- Fifteen species of diadromous fish, which spend most of the lives in freshwater, but which also include a marine stage in their life-cycle. These include longfin and shortfin eels as well as the galaxiid species comprising the whitebait catch.¹⁶

The Gulf borders on the largest and fastest growing city-region in New Zealand. More than a million people live within the Gulf's catchments.¹⁷ This is putting increasing pressure on the Gulf's biodiversity and natural resources. In particular, urban development and increased traffic flows are producing contaminated runoff which is polluting inner harbor and estuarine areas.

The Gulf also borders on extensive rural areas. Dairying on the Hauraki plains is intensifying, with higher stocking rates and increased levels of fertiliser application. High levels of nutrients are flowing into the Firth of Thames.¹⁸ Sedimentation from earthworks, farming and forestry is reducing water quality and smothering benthic habitats.

The Gulf is of considerable value to Māori. "Tangata whenua often refer to the Gulf as "pataka kai" a food-basket in the literal and metaphysical sense; a place from which spiritual and physical sustenance is gained".¹⁹

The Gulf is a major recreational resource and contributes significantly to the quality of life of nearby residents as well as domestic and international visitors. On a summer Saturday or Sunday, thousands of people use the beaches and inshore coastal areas, with up to 1,000 recreational boats engaged in fishing activity alone.

The Gulf's marine area is utilised for commercial fishing, aquaculture and shipping. Around 3,000 tonnes of fish are commercially caught from the Gulf each year from approximately 150 fishing boats. Snapper comprises the bulk of the commercial harvest, and is most commonly harvested through bottom trawling.²⁰ Close to 1,500 ships visit the Auckland port each year, including over 60 cruise ships.²¹

Aquaculture requires the allocation of marine space and is therefore of particular relevance to marine spatial planning. Marine farming for Pacific oysters and mussels is currently mainly undertaken in the Firth of Thames, around Great Barrier Island and in some harbours along the western coast of the Coromandel Peninsula. This includes 242 hectares of space within the Gulf's Auckland region²² and 1,523 hectares within the Gulf's Waikato region. This comprises just over 0.1 per cent of the Gulf's marine area.²³ There is interest in expanding the aquaculture industry within the Gulf, particularly into finfish species such as kingfish.

Marine protected areas also require the allocation of space. Within the Gulf there are currently five small marine reserves which protect less than 0.3 per cent of the Gulf's marine area. As well as being small, these areas are not representative of the Gulf's range of habitats and species with, for example, only an estimated 37 per cent of intertidal species present within the Gulf currently protected.²⁴ They also do not form an effective network.

Marine spatial planning is a process which could potentially assist with achieving more effective management of these growing pressures on the Gulf's resources. It could help to identify important resources and values which need to be protected as well as areas appropriate for specific activities.

Legal and policy framework for marine spatial planning

A statutory framework for undertaking marine spatial planning within the Gulf is provided by the HGMPA, RMA, NZCPS, Local Government (Auckland Council) Act 2009, Local Government Act 2002, Fisheries Act 1996 and various pieces of conservation legislation. Relevant provisions of these instruments are described below.

Hauraki Gulf Marine Park Act

One of the purposes of the HGMPA is to "integrate the management of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments" (section 3(a)). Integrated management, as discussed above, is one of the key purposes of marine spatial planning.

The HGMPA also recognises the "interrelationship" between different environments within the Gulf and sustaining the "life-supporting capacity" of the Gulf's marine area and islands as a matter of national significance (section 7). The life-supporting capacity of the Gulf is very much underpinned by the ecological health and productivity of its marine environment. The Act's recognition of these matters is

consistent with an ecosystem-based management. Marine spatial planning is an approach which can be used to implement ecosystem-based management in practice.

It is sustaining this 'capacity' of the Gulf to provide for a range of interests which should be the focus of environmental managers' efforts to implement the HGMPA, rather than how to allocate the Gulf's resources between competing users.

Section 8 of the HGMPA sets out six management objectives which provide greater guidance on how the national significance of the Gulf is to be recognised. These refer to the protection and (where appropriate) enhancement of the natural, historic and physical resources of the Gulf. Implementation of the management objectives is informed by strategic issues which are to be developed by the Hauraki Gulf Forum under section 17(1)(a) of the HGMPA.

The Forum is also required to prepare and publish a three-yearly Hauraki Gulf *state of the environment* report under section 17(1)(g). State of environment reporting helps identify significant stressors on the health and productivity of the Gulf's marine environment which need to be addressed through management action. State of the environment reports have been produced in 2004 and 2008. Work has started on preparation of the 2011 state of environment report.

The HGMPA establishes the Hauraki Gulf Forum which includes representatives of tangata whenua, regional councils, territorial authorities, and the Ministers of Conservation, Fisheries and Māori affairs. The Forum has several purposes including integrating management; promoting the conservation and sustainable management of the Gulf (where appropriate); facilitating communication, co-operation and co-ordination between statutory managers; and recognising the relationship of tangata whenua with the Gulf (section 15).

FIGURE 2: PURPOSES OF HAURAKI GULF FORUM

The Forum has the following purposes:

- (a) to integrate the management and, where appropriate, to promote the conservation and management in a sustainable manner, of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments, for the benefit and enjoyment of the people and communities of the Gulf and New Zealand:
- (b) to facilitate communication, co-operation, and co-ordination on matters relating to the statutory functions of the constituent parties in relation to the Hauraki Gulf, its islands, and catchments, and the Forum:
- (c) to recognise the historic, traditional, cultural, and spiritual relationship of tangata whenua with the Hauraki Gulf, its islands, and, where appropriate, its catchments.

Section 15, HGMPA

A marine spatial planning process could assist the Forum in achieving its statutory purposes. It could help promote integrated management, the conservation and sustainable management of the Gulf's resources, less conflict over the use of resources, a closer working relationship between statutory managers, and a means through which the relationship of tangata whenua with the Gulf could be better recognised.

FIGURE 3: RELATIONSHIP OF TANGATA WHENUA WITH THE GULF

Tikapa Moana in its entirety, *mai i te Rangi ki te koopu o te whenua*, is an integral link in our whakapapa connecting us to Tangaroa, Papatuanuku, Ranginui, back in a long chain of being to Te Matua Kore, the Void. Our whakapapa connection provides the passageway for the mauri, life-energy force, to descend from Te Kore to all things in the natural world and thence to humankind.

Tangata whenua values relating to Tikapa Moana are intricately bound to preserving our whakapapa links and thus our survival. Thus we are faced with the responsibility of adhering to our Kawa principles to ensure that our whakapapa connection remains intact.

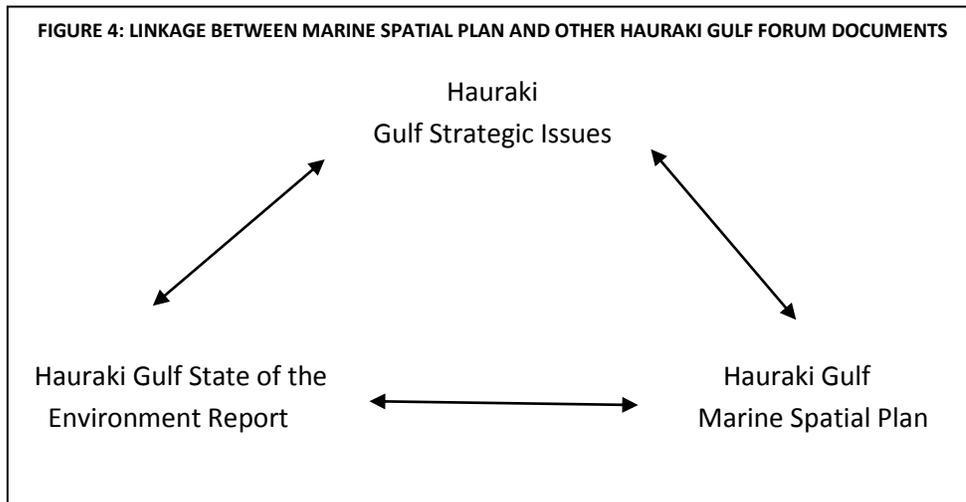
Any management strategy has to recognise and provide for this basic principle, that is the foundation for recognising and planning for the comprehensive management of Tikapa Moana in its entirety in the first instance, before identifying and managing discrete spaces within Tikapa Moana.

In this context we are faced with two differing meanings of "*space*", that of Pakeha which is fragmented into discrete spaces having material and physical value, each with its own management strategy, in comparison with the comprehensive spiritual view of tangata whenua as Tikapa occupying a comprehensive space and managed under the all-embracing principle of Kawa

Betty Williams, Tangata Whenua Member, Hauraki Gulf Forum

A marine spatial plan could also help provide a better linkage between strategic issues and the Gulf's state of environment report (see Figure 4). The documents could be mutually supportive of each other as follows:

- *Hauraki Gulf Strategic Issues* identify the most significant impacts from human activities which threaten the healthy ecological functioning of the Gulf's marine area. These are the major stressors on the Gulf's marine system.
- *Hauraki Gulf Marine Spatial Plan* translates the issues into a strategic and spatial planning framework that provides guidance on how the spatial element of threats will be addressed
- *Hauraki Gulf State of the Environment Report* regularly assesses the extent to which the integrated marine spatial planning framework has been implemented and strategic issues addressed. The findings of the state of the environment report inform reviews of strategic issues and/or the spatial plan.



Resource Management Act

The RMA provides a more detailed framework for marine spatial planning. Similar to the HGMPA, the RMA encompasses an integrated and ecosystem-based approach to marine management. The sustainable management purpose of the RMA in section 5 includes “safeguarding the life-supporting capacity of air, water, soil and ecosystems,” which is to be achieved whilst enabling peoples and communities to provide for their social economic and cultural wellbeing. Section 6(c) requires the protection of “areas of significant indigenous vegetation and significant habitats of indigenous fauna”.

The marine area of the Gulf is managed by two councils, the Auckland Council (a unitary authority with the functions of a regional and district council) and Waikato Regional Council. These councils are tasked with the integrated management of the natural resources of their region which includes the coastal marine area (section 30(1)(a)). Their functions include the maintenance of the quality of coastal water, maintenance and enhancement of marine ecosystems, and the maintenance of indigenous biological diversity (section 30(1)).

The RMA requires regional councils to prepare a regional policy statement which applies to the entire region, as well as a regional coastal plan for the coastal marine area, with the latter document requiring approval by the Minister of Conservation.

RMA plans can be combined within and between regions and can also be prepared for sub-sets of regions. This means, for example, that it would be possible to develop a joint regional policy statement for the Gulf, a joint regional coastal plan for the Gulf (which covers the marine area), and/or a joint regional coastal environment plan for the Gulf (which covers the coastal environment including land and sea). Other combinations are also possible, including joint regional and district plans.

All these planning documents can include a spatial element, with regional and district plans also able to contain rules attached to spatial zoning.

The *Aquaculture Legislation Amendment Bill (No 3)*, which was introduced into Parliament in November 2010, is designed to kickstart the aquaculture industry by streamlining the current planning and consenting regime. Currently, resource consent applications for marine farms can only be made within aquaculture management areas identified in regional coastal plans. As a result of the proposed reforms, resource consent applications for marine farms will be possible anywhere within the Gulf where marine farming is not explicitly prohibited in the regional coastal plan.

The Waikato Regional Coastal Plan currently includes a prohibition on marine farming outside identified aquaculture zones and restricts the methods which may be used within these areas to longlines. The Bill proposes to directly change the Waikato Regional Coastal Plan, to remove the restriction on methods within the current aquaculture zones, without undergoing a public submission or appeal process under the RMA. This means that resource consent applications for activities such as finfish farming will be possible within these areas. Small extensions to existing farms will also be allowed under these provisions. Resource consent applications for aquaculture will not be possible outside these expanded

zones unless the provisions of the regional coastal plan are further changed.²⁵ Environment Waikato is currently preparing a plan change which will amend these provisions.

In much of the Gulf within the Auckland region, *Gazette* notices promulgated under the Marine Farming Act 1971, identified a large part of the Gulf (but not Great Barrier Island) as unavailable for marine farming leases or licences. The *Gazette* notices became part of the transitional Auckland Regional Coastal Plan when the RMA came into force in 1991. These transitional provisions have yet to be replaced by operative provisions in the new regional coastal plan and so still remain in force.

The immediate effect of the proposed aquaculture reforms in the Auckland region will be no change to the status quo for marine farming within the restricted area, but resource consent applications for marine farms will be possible anywhere outside the restricted area, including in coastal areas around Great Barrier Island. The *Gazette* notices did not apply to spat catching, so resource consent applications for spat catching anywhere within the Gulf, will be possible, once the proposed amendments are made to the RMA.

New Zealand Coastal Policy Statement 2010

All plans prepared under the RMA are required to give effect to the NZCPS. Where there is a conflict between sections 7 and 8 of the HGMPA and the NZCPS, the NZCPS prevails (section 10(2), HGMPA).

A revised NZCPS has been approved by the Minister of Conservation and came into effect on 3 December 2010. It provides much stronger direction to councils on the management of the coastal environment including the marine area.

All of the provisions in the NZCPS are applicable to marine spatial planning in the Gulf. They include, of particular relevance:

- *Ecosystem-based management* – Objective 1 refers to sustaining ecosystems in marine and intertidal areas, estuaries and dunes through maintaining or enhancing biological and physical processes; protecting representative or significant natural ecosystems and sites of biological importance; and maintaining and enhancing coastal water quality
- *Spatial provision for uses* – a range of policies require provision for uses of the marine area including the spatial identification of appropriate places for aquaculture (Policy 8 – see Figure 4); provision for the operation and development of ports (Policy 9); and consideration of the potential for renewable marine energy generation (Policy 6(1)).
- *Integrated management* - Policy 4 requires the co-ordinated management or control of activities within the coastal environment which cross-administrative boundaries such as across local authority boundaries within the coastal marine area
- *Māori heritage* – Policy 2 requires the identification, assessment, protection and management of areas and sites of significance or special value to Māori

- *Strategic planning* – Policy 7 requires regional policy statements and plans to identify where particular activities and forms of use and development are inappropriate and provide protection from such activities in these areas through objectives, policies and rules.
- *Cumulative effects* – Policy 7 requires coastal processes, resources or values that are under threat or at significant risk from adverse cumulative effects to be identified. It also requires plans, where practicable, to set thresholds or specify acceptable limits of change to assist in determining when activities causing adverse cumulative effects are to be avoided.
- *Biodiversity protection* – Policy 11 requires councils to avoid adverse effects on threatened or at risk indigenous species, threatened or naturally rare ecosystems and vegetation types, and areas containing nationally significant examples of indigenous community types amongst others. In practice this will require the location of these species and habitats to be identified spatially.

Policy 11 also requires councils to avoid significant adverse effects on habitats important during the vulnerable stage of indigenous species; ecosystems and habitats particularly vulnerable to modification; habitats for indigenous species that are important for recreational, commercial, traditional and cultural purposes; habitats important to migratory species; and ecological corridors. These are also likely to require spatial identification if they are to be adequately protected.

- *Natural character* – Policy 13 requires councils to map or otherwise identify at least areas of high natural character
- *Outstanding natural landscapes* – Policy 15 requires councils to identify and assess the natural features and natural landscapes of their region or district
- *Historic heritage* – Policy 17 requires councils to identify, assess and record historic heritage including archaeological sites
- *Enhancing water quality* – Policy 21 requires councils to identify areas of coastal water where the quality has deteriorated and is having a significant adverse effect on ecosystems, natural habitats or water-based recreational activities, or is restricting existing uses such as aquaculture, shellfish gathering and cultural activities
- *Coastal hazards* – Policy 24 requires councils to identify areas potentially affected by coastal hazards including tsunami

FIGURE 5: PROVISION FOR AQUACULTURE

Recognise the significant existing and potential contribution of aquaculture to the social, economic and cultural well-being of people and communities by:

- (a) including in regional policy statements and regional coastal plans provision for aquaculture activities in appropriate places in the coastal environment, recognising that relevant considerations may include:
 - (i) the need for high water quality for aquaculture activities; and
 - (ii) the need for land-based facilities associated with marine farming;
- (b) taking account of the social and economic benefits of aquaculture, including any available assessments of national and regional economic benefits; and
- (c) ensuring that development in the coastal environment does not make water quality unfit for aquaculture activities in areas approved for that purpose.

Policy 8, NZCPS

Local Government (Auckland Council) Act 2009

A unitary authority for the Auckland region, the Auckland Council, was established on 1 November 2010. The new unified council replaces the Auckland Regional Council and six territorial authorities

The *Local Government (Auckland Council) Act 2009* (as amended in 2010) requires the new Auckland Council to prepare and adopt a spatial plan for the Auckland region. The marine area comprises almost 70 per cent of the Auckland region and therefore will be an important component of the spatial plan. A recent unpublished report defining the preferred approach to spatial planning for Auckland reinforced the significance of the Hauraki Gulf in the exercise, by stating:²⁶

“All of the eastern section of the region’s maritime area also falls within the Hauraki Gulf Maritime Park area. This is on a par with national parks in terms of status and significance and should be seen as a key element in the city’s future planning.”

Section 79 of the Act describes the purpose of the spatial plan (see Figure 5). It is to set a strategic direction for Auckland’s growth and development which “integrates social, economic, environmental and cultural objectives”. It is to enable “coherent and co-ordinated decision making by Auckland Council” and other parties to determine the future location and timing of crucial infrastructure, services and investment. It is also to provide a basis for “aligning implementation plans, regulatory plans and funding programmes”. It is to have a 20 to 30 year time frame.

The spatial plan is required to identify nationally and regionally significant (section 79(4)(e)):

- Recreational areas and open spaces within Auckland
- Ecological areas within Auckland that should be protected from development

- Environmental constraints on development within Auckland (such as flood-prone or unstable land)
- Landscapes, areas of historic heritage value, and natural features within Auckland.

The spatial plan will be a statutory document prepared under the Local Government (Auckland Council) Act 2009. The plan must be prepared using the special consultative procedure. The procedure is set out in section 83 of the Local Government Act 2002 and requires interested parties to have the opportunity to make written submissions and be heard before the council makes a final decision.

The relationship between the spatial plan and RMA plans has yet to be determined. Several possibilities have been outlined in a discussion document prepared by the Ministry for the Environment and include:²⁷

- Having no legal link between the Auckland spatial plan and RMA planning documents.
- Incorporating the regional policy statement into the Auckland spatial plan which would effectively mean that regional and district plans would need to give effect to it.
- Providing that RMA planning documents either “give effect to”, “be consistent with” or have “regard for” the Auckland spatial plan.

The new Auckland legislation therefore effectively requires marine spatial planning, at a broad strategic level, to be undertaken for the portion of the Hauraki Gulf within the Auckland region. There is no similar requirement for the balance of the Gulf located within the Waikato region. Achieving integrated management of the Gulf will require a mechanism whereby marine spatial planning can be extended across the entire system.

FIGURE 6: SPATIAL PLAN FOR AUCKLAND

- (1) The Auckland Council must prepare and adopt a spatial plan for Auckland.
- (2) The purpose of the spatial plan is to contribute to Auckland's social, economic, environmental, and cultural well-being through a comprehensive and effective long-term (20- to 30-year) strategy for Auckland's growth and development.
- (3) For the purposes of subsection (2), the spatial plan will—
 - (a) set a strategic direction for Auckland and its communities that integrates social, economic, environmental, and cultural objectives; and
 - (b) outline a high-level development strategy that will achieve that direction and those objectives; and
 - (c) enable coherent and co-ordinated decision making by the Auckland Council (as the spatial planning agency) and other parties to determine the future location and timing of critical infrastructure, services, and investment within Auckland in accordance with the strategy; and
 - (d) provide a basis for aligning the implementation plans, regulatory plans, and funding programmes of the Auckland Council.
- (4) The spatial plan must—
 - (a) recognise and describe Auckland's role in New Zealand; and
 - (b) visually illustrate how Auckland may develop in the future, including how growth may be sequenced and how infrastructure may be provided; and
 - (c) provide an evidential base to support decision making for Auckland, including evidence of trends, opportunities, and constraints within Auckland; and
 - (d) identify the existing and future location and mix of—
 - (i) residential, business, rural production, and industrial activities within specific geographic areas within Auckland; and
 - (ii) critical infrastructure, services, and investment within Auckland (including, for example, services relating to cultural and social infrastructure, transport, open space, water supply, wastewater, and stormwater, and services managed by network utility operators); and
 - (e) identify nationally and regionally significant—
 - (i) recreational areas and open-space areas within Auckland; and
 - (ii) ecological areas within Auckland that should be protected from development; and
 - (iii) environmental constraints on development within Auckland (for example, flood-prone or unstable land); and
 - (iv) landscapes, areas of historic heritage value, and natural features within Auckland; and
 - (f) identify policies, priorities, land allocations, and programmes and investments to implement the strategic direction and specify how resources will be provided to implement the strategic direction.

Section 79, Local Government (Auckland Council) Amendment Act 2010

The Local Government Act provides the framework for the operation of councils within the Gulf. One of the purposes of local government is to “promote the social, economic, environmental, and cultural well-being of communities, in the present and for the future” (section 10(b)). Under the legislation, councils are required to prepare a long-term council community plan. The purpose of the plan, as set out in Figure 7, includes describing community outcomes, providing “integrated decision-making and co-ordination of the resources” of the council and providing a long-term focus for decisions and activities (section 93(6)). The plan also serves to provide an opportunity for public participation in council decision-making processes. These purposes are compatible with those of a marine spatial plan.

FIGURE 7: LONG-TERM COUNCIL COMMUNITY PLAN

The purpose of a long-term plan is to—

- (a) describe the activities of the local authority; and
- (b) describe the community outcomes of the local authority's district or region; and
- (c) provide integrated decision-making and co-ordination of the resources of the local authority; and
- (d) provide a long-term focus for the decisions and activities of the local authority; and
- (e) provide a basis for accountability of the local authority to the community; and
- (f) provide an opportunity for participation by the public in decision-making processes on activities to be undertaken by the local authority.

Section 93(6), Local Government Act 2002

Fisheries Act 1996

The Fisheries Act provides the framework for managing fishing activity within the Gulf. The purpose of the Act is “to provide for the utilisation of fisheries resources while ensuring sustainability” (section 8(1)). “Utilisation” is defined in the Act as “conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing.” This means that provision for the conservation and enhancement of fisheries resources is an integral part of the purpose the Fisheries Act, as is provision for their use and development, to the extent that this enables people to provide for their wellbeing.

The Act contains a set of environmental principles, in section 9, which imply the need to adopt an ecosystems-based and integrated approach to fisheries management. These include the principles that:

- (a) Associated or dependent species should be maintained above a level that ensures their long-term viability
- (b) Biological diversity of the aquatic environment should be maintained
- (c) Habitat of particular significance for fisheries management should be protected

The Act enables the Minister to approve fisheries plans under section 11A. Fisheries plans set out the framework within which fisheries management decisions are made. They enable a more strategic and objectives-based approach to be applied to fisheries management. They can include a spatial element.

In September 2009, the Ministry of Fisheries released a document titled *Fisheries 2030* which provides a clearer strategic direction on how fisheries in New Zealand will be managed under the Fisheries Act and other legislation.²⁸ The document sets out key values, principles, outcomes and strategic actions to be undertaken to achieve the overall goal of “New Zealanders maximising benefits from the use of fisheries within environmental limits”. The provisions of *Fisheries 2030* support a move towards an ecosystems-based fisheries management system. For example, it identifies one of the key principles to apply to fisheries management as being “We apply an ecosystem-based approach to fisheries management decision-making”.

Fisheries 2030 also addresses integrated management. One of the outcomes identified is that “impacts, including cumulative impacts, of activities on land, air or water on aquatic ecosystems are addressed.” Another outcome states that “habitats of special significance to fisheries are protected.” This will require the spatial location of those habitats to be identified.

Marine spatial planning is consistent with the principles under the Fisheries Act and is a tool which can assist with achieving policy as expressed in *Fisheries 2030*.

Conservation legislation

There is a range of conservation legislation which applies to the Gulf and which is administered by the Department of Conservation. This includes the Conservation Act 1987, the Marine Reserves Act 1971, the Marine Mammals Protection Act 1978 and the Wildlife Act 1952.

Under the Conservation Act, the Minister of Conservation can prepare conservation management strategies which guide the Department’s work. The purpose of conservation management strategies, under section 17D(1) of the Conservation Act, is to “implement general policies and establish objectives for the integrated management of natural and historic resources,” managed by the Department under a range of legislation including the Wildlife Act 1953, the Marine Reserves Act 1971, the Marine Mammals Protection Act 1978, and the Hauraki Gulf Marine Park Act 2000.

In 2005, the government released the *Marine protected areas policy statement and implementation plan*.²⁹ The purpose of the policy is to “protect marine biodiversity by establishing a network of MPAs [marine protected areas] that is comprehensive and representative of New Zealand’s marine habitats and ecosystems”. The Ministry of Fisheries and the Department of Conservation are jointly responsible for implementing the policy.

The marine protected area implementation plan identifies fourteen biogeographic regions which collectively cover the entire New Zealand marine area out to the 200 metre depth contour. Each of these regions is to be the focus of a planning process undertaken by community-based marine protection planning fora consisting of stakeholders and supported by staff from the Ministry of Fisheries

and the Department of Conservation. Guidelines have been released which are designed to assist for a in identifying and selecting candidate areas for marine protection.³⁰

The Hauraki Gulf falls within the north-east biogeographic region which extends from Ahipara on the north-west coast, around North Cape, and down the east coast as far as East Cape. No forum has yet been established to progress the identification of marine protected areas in this region.

Marine spatial planning is consistent with conservation management under this legislation and policy, and could assist with the identification of prospective marine protected areas as envisaged by the *Marine protected areas policy statement and implementation plan*.

The need for a marine spatial plan for the Gulf

There are several key factors, as described more fully above, which point to the desirability of developing a marine spatial plan for the Gulf:

- There are increasing pressures on the health of the Gulf's marine environment. At the same time, there are growing demands to utilise the Gulf for both recreational and economic activities. Conflicts between users, and between users and sustaining the health of the marine environment, are becoming more acute. These include conflicts between aquaculture expansion and recreational boating; conflicts between the establishment of marine reserves and fishers; and conflicts between catchment activities impacting on water quality and aquaculture. Marine spatial planning could provide a mechanism to address these conflicts proactively to achieve both environmental and economic benefits.
- There are clear legal requirements for management agencies to undertake some spatial planning for the marine environment, including the policies contained within the NZCPS 2010 and the requirement for the Auckland Council to prepare a spatial plan for the Auckland region.
- Government has adopted a policy of expanding the aquaculture industry, an activity which requires marine space, and therefore needs to be spatially planned for. The NZCPS 2010 requires councils to make provision for aquaculture activities in regional policy statements and regional coastal plans.
- The Hauraki Gulf Forum is tasked with integrating management of the Gulf. Marine spatial planning could provide an effective process to achieve such integration and to help the Forum meet its purpose of promoting the conservation and sustainable management of the Gulf's resources "for the benefit and enjoyment of the people and communities of the Gulf and New Zealand" (section 15(a), HGMPA).

How the plan could be prepared

So how might a marine spatial plan for the Hauraki Gulf be prepared? Key elements of a possible marine spatial planning initiative for the Gulf are described below, drawing on the international case study material.

Size of planning area

The Hauraki Gulf Marine Park covers 13,900 square kilometers of sea. This is larger than the area covered by four of the case study initiatives and smaller than that covered by the remaining four. This suggests that the Hauraki Gulf Marine Park is an appropriate-sized area for a marine spatial planning initiative. As already indicated, marine spatial planning is a tool which can be effectively applied at a range of scales.

Although marine spatial plans typically focus on the marine area, to be effective in addressing key issues affecting the Gulf, such a plan would also need to address the land-sea interface. This would include, for example, land-based activities which impact on the marine area and the impact of the marine area on land (such as through coastal hazards).

A marine spatial plan for the Gulf could help to achieve one of the purposes of the HGMPA which is to “integrate the management of the natural, historic, and physical resources of the Hauraki Gulf”. It could also assist the Auckland Council and Environment Waikato to achieve their function under the RMA of integrated management.

Management and advisory bodies

In all the case study planning initiatives reviewed, the process was led by government agencies. The Auckland Council and the Waikato Regional Council are the agencies responsible for coastal planning in the Gulf under the RMA. The Ministry of Fisheries is responsible for the management of fisheries and development of fisheries plans under the Fisheries Act. The Department of Conservation and Ministry of Fisheries are jointly responsible for the implementation of marine protected area planning. The Department of Conservation is also responsible for conservation planning and the management of protected species.

Membership of the Hauraki Gulf Forum includes these agencies and others involved in managing the Gulf as well as iwi representatives. It could therefore be an appropriate body to serve as a communication point and facilitator for a spatial planning process for the Gulf.

Those management agencies not represented on the Forum, such as Maritime New Zealand (which oversees maritime transport and offshore mining installations) and Biosecurity New Zealand, could potentially be engaged in a joint spatial planning process with Forum members as appropriate.

Day-to-day management of the process, and preparation of the spatial plan, would need to be undertaken by a specialised project team.

In most of the case studies, a multisectoral advisory group was established as the primary vehicle for stakeholders to constructively engage with the process. The Rhode Island initiative adopted an interesting approach which appears to have been largely successful. During the plan preparation process, an independently chaired stakeholder group met monthly. It received regular updates on the project’s progress and presentations on scientific and technical work as it was progressed. It also provided a mechanism through which stakeholders could openly discuss issues and concerns and gain an appreciation of each others’ points of view.

However, it is important to note that in the Rhode Island case, the stakeholder group was not asked to formally accept or reject the material in the plan. The only case study project which attempted to adopt a stakeholder-led collaborative planning process, the Canadian Eastern Scotian Shelf project, failed to develop a spatial plan.

This experience suggests that elements of an appropriate collaborative model for a marine spatial planning exercise in the Hauraki Gulf could include:

- Close collaboration between Hauraki Gulf Forum members to jointly oversee the development of the marine spatial plan
- A mechanism to ensure close engagement by stakeholders with the plan development process
- Joint endorsement of the plan by Hauraki Gulf Forum members
- Agreement by members of the Hauraki Gulf Forum to incorporate the outcomes of the spatial plan into statutory plans

Role of marine users

It is essential that marine industries and users of the ocean are involved in the planning process. This includes users such as Ports of Auckland, the maritime industry, the aquaculture industry, the sand mining industry, the fishing industry, boating clubs, underwater diving clubs and other recreational users. This will help the planning team to identify what future developments and activities are prospective and how this will translate into demand for and use of space. This type of information helps the marine spatial plan to be anticipatory, forward-looking and pro-active instead of providing a reactive approach to oceans management.

Resourcing

A marine spatial planning process for the Gulf would need to be resourced. Forum member organisations could be expected to contribute to the initiative, on the basis that the resulting marine spatial plan will simplify and reduce the work needed to develop statutory plans.

The Auckland Council will, through necessity, be resourcing spatial planning in order to prepare the mandatory Auckland spatial plan. The data gathering, mapping and analysis work undertaken for that project, could also inform a wider Gulf marine spatial planning initiative, and this could result in considerable cost savings. However, a similar information gathering and analysis exercise for the portion of the Gulf within the Waikato region, would need to be undertaken and resourced.

Additional funding may well be available from other sources in New Zealand and overseas, particularly given the potentially innovative nature of the planning process, and the national and international significance of the Gulf.

Methodology

The steps that were common to many of the case study plan preparation processes should be equally applicable to the Gulf. A framework for how they might be applied is summarised in Figure 8.

FIGURE 8: APPLICATION OF SPATIAL PLAN PREPARATION STEPS TO THE HAURAKI GULF

Element	Application to the Gulf
Identification of goals, principles and/or strategies to guide the process	The HGMPA, strategic issues and state of environment report provide a set of goals and principles which form a framework to potentially guide the process. These could be further refined through a consultation process.
Collation of spatial information on the marine environment and human uses	Considerable spatial information is already available for the Gulf including that contained in the Auckland Regional Council core spatial database (which has been transferred to the Auckland Council) and datasets held by Environment Waikato, the Department of Conservation, University of Auckland, Auckland University of Technology, NIWA, Ministry for the Environment, the Ministry of Fisheries and by iwi. Available datasets would need to be scrutinised for their reliability and usefulness in a marine spatial planning context.
Bioregionalisation of the planning region	Broad bioregionalisation has already been undertaken in some areas as part of the Interim Nearshore Marine Classification system developed by the Department of Conservation and the Marine Environments Classification system developed by the Ministry for the Environment. Some refinement has been undertaken through the national marine protected area initiative. This work could be adapted as necessary.
Identification of ecologically valuable and sensitive areas Identification of areas providing valuable ecosystem services	This would involve interpretation of the spatial and other available information, to identify the ecological backbone of the Gulf, including areas providing important ecosystem services, with interpretation being undertaken by scientists (see science advisory group discussion below)
Spatial identification of compatibilities and conflicts Consideration of management approaches/options Identification of spatial management areas	These stages could be undertaken by the plan development team, in close collaboration with the science and stakeholder groupings. GIS platforms would assist with assessing the impacts of different proposals on the ecological health of the Gulf.
Finalisation of the plan	The final plan could be endorsed by the Hauraki Gulf Forum constituent members and other partners.

Role of science

The international review has indicated that scientific information plays a key role in the development of marine spatial plans. It is therefore important that a team of appropriate scientists oversee the selection and use of scientific data. The scientists will need to be well briefed to ensure that the scientific data selected is appropriate for the planning process. Scientists also play an important role in the identification and prioritisation of ecologically important marine areas, and in identifying gaps in knowledge and future research priorities. An appropriate group of scientists could be formalised into a *Hauraki Gulf Science Advisory Group* to oversee the necessary scientific work.

Work is underway to prepare the Hauraki Gulf State of the Environment Report 2011. This work could help inform a marine spatial planning process as well as identify gaps in current knowledge and management responses.

What the plan might contain

As indicated in the international review there is a wide variety of material which can be included in marine spatial plans. This ranges from the identification of candidate marine protected areas in Australian bioregional plans to full zoning as applied to the Great Barrier Reef Marine Park. In Belgium the plan is seen as work in progress, with new elements incorporated over time as work is progressed.

So what content might be appropriate for a marine spatial plan for the Gulf? The focus of the HGMPA is on integrated management and sustaining the life-supporting capacity of the Gulf's marine areas and islands. It also emphasises the importance of people and communities to be able to use the Gulf's resources for economic activities and recreation. This indicates that a Gulf marine spatial plan could focus on developing integrated management approaches for protecting and enhancing, the "ecological backbone" of the Gulf's marine area including areas providing important ecological services. It could also identify areas which may be suitable for specific activities.

So initially a marine spatial plan for the Gulf might include some or all of the following:

- *Spatial identification of the "ecological backbone" of the Gulf.* This could include ecologically important marine areas and connections between them such as areas of high biodiversity, fish nursery areas, shell-fish beds, important benthic habitats, important migratory routes for fish and marine mammals, important habitats for seabirds, salt marshes, sea grass beds, sponge gardens, horse mussel beds and mangrove forests. It could also include areas providing valuable ecosystem services such as estuaries and coastal wetlands.
- Areas having different important ecological functions could initially be shown on individual maps. This information could possibly be combined to identify the most ecologically important areas and connections within the Gulf. Such an exercise was piloted in the Massachusetts planning process, where a group of scientists ranked priority areas for marine life and habitat, as a way of synthesising different layers of information.

- The *spatial identification of different uses and values attached to the Gulf* including cultural, social and economic.
- The *spatial identification of areas of conflict*, such as those between catchment activities and ecologically important marine areas, between marine users and those areas, and between different marine users.
- *Strategies and tools to address conflicts* including the spatial identification of marine areas to be managed for specific purposes, and areas suitable for specific activities such as aquaculture. More detailed zoning could be contained in regional coastal plans.

Provision for Māori use and development

The relationships of tangata whenua with the Hauraki Gulf are provided for in the HGMPA. How these relationships should be manifested in planning processes has been set out in *Governing the Gulf*. Applying this framework to marine spatial planning suggests that the *content* of the spatial plan could include:

- Identification of marine wahi tapu areas
- Location of resources of special value to tangata whenua
- Identification of important sea routes, including initial migrations and tribal linkages
- Locations of traditional waka moorings
- Location of traditional landmarks used for navigation
- Use of traditional marine place names
- Identification of resources of importance to contemporary iwi development

The *Governing the Gulf* framework can also inform the *process* of the spatial plan's development which should include the following:

- Effective communication with and inclusion of tangata whenua
- Allowing for the diversity of tangata whenua views
- Ensuring that concepts such as mauri guide the plan's development, and that mātauranga Māori has its importance recognised

Content might also include recognition of protected customary rights and customary marine title under the Marine and Coastal Area (Takutai Moana) Bill if passed into legislation. It is noted in this respect that Clause 91(6) requires regional councils "to recognise and provide for" matters within customary marine title planning documents in their regional planning documents.

Implementation and monitoring

There are several options for how a Gulf marine spatial plan might be implemented.

Non-statutory plan

The marine spatial plan could remain a non-statutory plan and be used as guidance by the various planning and regulatory authorities when exercising their regulatory functions. Statutory plans could include a reference to the marine spatial plan. However, the weakness in this approach is that the plan would have no formal status in legal proceedings such as appeals to the Environment Court or High Court.

Incorporation into the Auckland spatial plan

The Auckland spatial plan will cover all the land and coastal marine area of the Auckland region and this will include the coastal marine area on the west coast of Auckland as well as the Gulf. It is also important to note that the Auckland spatial plan does not cover the portion of the Gulf which falls within the Waikato region. Spatial planning for the Hauraki Gulf will therefore only be a subset of the Auckland spatial plan, and the Auckland spatial plan will only cover a portion of the Hauraki Gulf. It is not a precise match.

As indicated above, it is important that the Auckland spatial plan addresses key strategic decisions affecting the impacts of Auckland's growth and development on the marine area. These are likely to include:

- *Level, timing and location of investment in upgrading existing stormwater and wastewater systems* – this affects the location and number of polluted stormwater flows entering into the Hauraki Gulf. Current models show sediment contaminants are exceeding, or are projected to exceed, levels that impact marine ecology in several areas of Auckland harbours.
- *Location and timing of future greenfields urban development* – this affects sediment flows into the Hauraki Gulf from vegetation removal and earthworks. It also affects heavy metal and other pollutant flows into the Hauraki Gulf resulting from traffic movements. If located close to the coastal edge, development potentially affects public access to the marine area, the natural character of the coastal edge, coastal landscapes and coastal hazard risk.
- *Nature, timing and location of investment in addressing coastal hazards (both addressing current risks and future-proofing)* – hard coastal defences can leave insufficient space for natural systems to move inland with sea-level rise. They can also effect the ecological health of coastal system, the quality of coastal natural character and landscapes and public access to the coastal edge and marine area.

The plan could also articulate a vision for the Hauraki Gulf in terms of its contribution to the well-being of Auckland, and recognize the potential benefits for Auckland of the Gulf being in a healthier, more abundant and bio-diverse state.

It seems likely that there will ultimately be a statutory linkage between the Auckland spatial plan and RMA plans, although this issue has yet to be determined by government. A statutory linkage would help ensure implementation of the Auckland spatial plan through resource management decision-making.

The time frame for the preparation of the Auckland spatial plan is relatively short, with the plan programmed to be completed by the end of 2011. This means that, practically speaking, the first Auckland spatial plan will only address marine spatial planning issues at a high level, rather than undertaking fine-grained analysis.

The plan will then be further developed in subsequent iterations.

One possible approach, given this short time frame, would be for the Auckland spatial plan process to undertake some of the earlier stages of a marine spatial planning process for the Gulf, such as:

- Collation of existing spatial information on the Gulf's marine environment
- A first cut at bioregionalisation of the marine area
- A first cut at identification of ecologically important marine areas which form the "ecological backbone" of the Gulf including those providing valuable ecosystem services.

This marine spatial information could then be used to inform the assessment of development options which may be considered. It could also consider the returns on making investments in enhancements to increase fish stocks or natural biodiversity to simulate economic activity.

A finer-grained analysis, which would be extended to include the entire Gulf, and help identify specific spatial management areas, could then be undertaken in collaboration with other management agencies (including the Waikato Regional Council) as a second stage and could inform a subsequent version of the Auckland spatial plan as well as RMA documents in the Waikato region. It could also provide additional guidance on the implementation of the Auckland spatial plan into RMA and other statutory planning documents.

Incorporation into RMA plans

Elements of a marine spatial plan could be incorporated into the Auckland and Waikato regional policy statements. This would assist in integrating the marine spatial plans with catchment management. Regional policy statements may not contain rules, but can contain maps delineating areas and provide strong direction on how the areas are to be managed. Regional and district plans must give effect to regional policy statements.

The marine spatial plan could also subsequently be incorporated into the Auckland and Waikato regional coastal plans, or alternatively a combined regional coastal plan for the Hauraki Gulf could be adopted jointly by both councils. As regional coastal plans can contain rules, this would ensure that the plan had regulatory teeth.

Monitoring

The plan should, where possible, include a schedule for monitoring, evaluation and adaptation. The monitoring should include both the state of the environment and the performance of the plan (that is, does the marine spatial plan achieve its anticipated goals).

The Rhode Island case study provides an interesting model for a monitoring system which can accompany a marine spatial plan. A similar approach could be applied to the Gulf. This might include a dedicated Hauraki Gulf website, on which monitoring, consenting, policy and research information which is applicable to the Gulf, is regularly posted.

The tri-ennial Gulf state of the environment report could assess the implementation and effectiveness of the marine spatial plan. In addition, an annual or bi-annual Hauraki Gulf Symposium could be held to review progress in implementing the plan, developments in research and science, and new issues. It could also serve to recognise successes, reflect on lessons learnt and to highlight the national and international importance of the Gulf.

FIGURE 9: POTENTIAL ELEMENTS OF MARINE SPATIAL PLANNING APPLIED TO THE HAURAKI GULF

Potential element	Application to the Gulf
Legal framework	HGMPA
Plan development	Inter-agency project planning team
Stakeholder engagement	Possibly a stakeholder advisory group
Scientific contribution	Group of specialist scientists
Resources	Hauraki Gulf Forum members Possibly also external funding
Purpose and objectives	Sections 7 and 8 HGMPA Hauraki Gulf Strategic Issues Hauraki Gulf State of the Environment Report Further consultation
Content of plan	Spatial identification of ecologically important marine areas Spatial identification of different uses and values attached to the Gulf including cultural, social and economic Spatial identification of areas of significance to tangata whenua Spatial identification of areas of conflict between human activities and ecologically important marine areas Identification of spatial strategies and tools to address conflict Spatial identification of areas suitable for specific uses such as aquaculture
Implementation	Auckland spatial plan RMA plans Other statutory plans
Monitoring	Dedicated Hauraki Gulf website Hauraki Gulf annual or bi-ennial Symposium Tri-ennial Hauraki Gulf State of Environment Report

5 Conclusions

1. Marine spatial planning is a well-accepted strategic planning process which could help achieve the purposes of the HGMPA including integrated management and the protection and enhancement of the life-supporting capacity of the Gulf.
2. The Hauraki Gulf Forum's role in promoting and facilitating integrated management could be utilized in a marine spatial planning process for the Gulf. Its members comprise most of the management agencies within the Gulf and also include iwi representation.
3. If a marine spatial planning process for the Gulf were to be initiated, it would be advisable to obtain a commitment from management agencies within the Gulf to engage in the process from the outset.
4. Resourcing for a marine spatial planning process would need to be obtained. Contributions could come from member organisations of the Hauraki Gulf Forum. The disparity between resources for spatial planning within the Auckland and Waikato regions would need to be addressed. Additional funding may be available from other sources, particularly given the innovative nature of such a planning process in New Zealand and the national and international significance of the Gulf
5. Clear objectives and principles would need to guide the spatial planning process. The provisions of the HGMPA, Hauraki Gulf Strategic Issues and the Hauraki Gulf State of Environment Report provide a useful framework for its development.
6. A marine spatial planning process needs to be strongly informed by science and have close involvement of the scientific community.
7. Tangata whenua values would need to be fully integrated throughout the process. This could be facilitated through effective involvement of the tangata whenua members of the Forum and their technical officers in the planning process.
8. Development of the marine spatial plan could include the identification and mapping of ecologically important and sensitive marine areas within the Gulf as well as mapping of important human uses and values (both current and anticipated). Conflicts (both existing and potential) between marine users and ecologically important areas, and catchment activities and those areas, could be identified. Areas suitable for specific uses such as aquaculture could also be identified. Spatial strategies could then be developed to help ensure that the ecological health of the Gulf is sustained.
9. Mechanisms for stakeholder engagement in the process would need to be carefully designed. Existing platforms may be sufficient to communicate with stakeholders. Another option could be the establishment of a multi-stakeholder group, chaired independently, which has ongoing involvement in the plan development process.

10. The process of developing the Auckland (Spatial) Plan seems likely to include the early stages of marine spatial planning and this information could help inform a wider Gulf spatial planning exercise.
11. The results of a marine spatial planning process should be incorporated into statutory plans where possible. This includes the Auckland and Waikato regional policy statements, at a strategic level, with more detailed mapping and rules incorporated into the Auckland and Waikato regional coastal plans.
12. Monitoring of the marine spatial plan could be linked to state of environment reporting for the Gulf. State of environment information could be provided in real-time through a dedicated and frequently updated website. Monitoring could also include the performance of the plan, to determine whether or not it has met expectations.
13. An annual or bi-ennial Gulf symposium could be held to review progress in implementing the spatial plan, lessons learnt, new research and emerging issues. It could also serve to assist with networking and maintaining the profile of the Hauraki Gulf Marine Park.

PART TWO: COUNTRY REVIEWS

6 Great Barrier Reef Marine Park Zoning Plan

The Great Barrier Reef Marine Park covers a very large marine area, encompassing 345,400 square kilometers, which is five times the size of Tasmania. The Park extends nearly 2,000 kilometres along the coast. It includes around 2,900 individual reefs, 900 islands and cays, and many other interconnected marine habitats including seagrasses, mangroves, shallow muddy inshore waters and deep offshore areas.³¹

The Park is heavily used for tourism, recreation and commercial fishing activities. Tourism in the catchment of the Park earns over A\$4 billion per annum, commercial fishing contributes much less at around A\$119 million and expenditure by the recreational fishing and boating sector in the catchment is twice this amount at around A\$240 million per annum.³²

The current zoning plan for the Park came into force in 2004 and replaced a myriad of earlier plans dating back to 1982. Prior to the 2004 plan, only 4.6 per cent of the Park was fully protected by no-take zones. Ongoing degradation of the Park's ecosystems, and increasing levels of use, led to an initiative to develop a new plan which would protect a more comprehensive and representative network of areas within the Park. The final plan increased the areas protected by a no-take zone (Marine National Park Zone) to 33 per cent of the Park.

Legal framework for the plan

The legal framework for the zoning plan is provided by the *Great Barrier Reef Marine Park Act 1975*. The main purpose of the legislation is 'to provide for the long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region' (section 2A(1)).

The Great Barrier Reef Marine Park Authority is tasked with preparing the zoning plan and partially implementing it. The purpose of the zoning plan, as set out in section 32 of the Act, encompasses both ecosystem protection and ecologically sustainable use (see Figure 8).

Before preparing the plan, the Authority is required to develop a set of operational principles to cover the environmental, economic and social objectives of the zoning plan (section 34). It is also required to prepare a statement of the environmental, economic and social values of the area (section 35).

FIGURE 10: PURPOSE OF THE GREAT BARRIER REEF MARINE PARK ZONING PLAN

- (a) to regulate the use of the Marine Park so as to:
 - (i) protect the ecosystem within the Great Barrier Reef Region; and
 - (ii) ensure the use is ecologically sustainable use; and
 - (iii) manage competing usage demands; and
- (b) to protect areas in the Marine Park that are of high conservation value; and
- (c) to protect and conserve the biodiversity of the Marine Park, including ecosystems, habitats, populations and genes; and
- (d) to regulate activities that exploit the resources of the Great Barrier Reef Region so as to:
 - (i) minimise the adverse effect of those activities on the Great Barrier Reef; and
 - (ii) ensure the ecologically sustainable use of the resources; and
- (e) to protect the world heritage values of the Great Barrier Reef World Heritage Area; and
- (f) to provide for the ecologically sustainable use of marine resources by traditional owners consistent with their traditional practices; and
- (g) to reserve some areas of the Great Barrier Reef Region for public enjoyment and appreciation; and
- (h) to preserve some areas of the Great Barrier Reef Region in a natural state, undisturbed except for the purposes of scientific research that cannot be undertaken elsewhere in the Marine Park.

Section 32, Great Barrier Reef Marine Park Act 1975

How the plan was prepared

An independent *Scientific Steering Committee*, comprised of scientists with particular expertise in the region, provided advice on scientific issues relevant to the selection of representative areas of biodiversity. The Committee developed a set of Biophysical Operational Principles to guide the identification of a network of no-take areas within the Marine Park (see Figure 3.2).

An independent *Social, Economic and Cultural Steering Committee* was also established to provide expert advice to the Park Authority. The Committee developed a set of Social, Economic, Cultural and Management Feasibility Operational Principles (see Figure 9). These contained four key principles, the first which was to 'maximise complementarity of no-take areas with human values, activities and opportunities'. This was to be achieved by placing no-take areas in locations that:

- Have been identified through a consultative process that is participatory, balanced, open and transparent
- Traditional Owners have identified as important and in need of high levels of protection
- Minimise conflict with Indigenous people's aspirations for their sea country
- Protect areas that the community identifies as special or unique

- Minimise conflict with non-commercial extractive users such as recreational fishers
- Minimise conflict with commercial extractive users
- Minimise conflict with all non-extractive users

FIGURE 11: BIOPHYSICAL OPERATING PRINCIPLES

1. Have no-take areas the minimum size of which is 20 kilometres along the smallest dimension (except for coastal bioregions, refer to Principle 6)
2. Have larger (versus smaller) no-take areas
3. Have sufficient no-take areas to insure against negative impacts on some part of a bioregion (typically 3 to 4)
4. Where a reef is incorporated into no-take zones, the whole reef should be included
5. Represent a minimum amount of each reef bioregion in no-take areas (protect at least 3 reefs with at least 20 per cent of reef area and reef perimeter included in no-take areas)
6. Represent a minimum amount of each non-reef bioregion in no-take areas (at least 20 per cent of area)
7. Represent cross-shelf and latitudinal diversity in the network of no-take areas
8. Represent a minimum amount of each community type and physical environment type in the overall network taking into account principle 7
9. Maximise use of environmental information to determine the configuration of no-take areas to form viable networks
10. Include biophysically special/unique places
11. Include consideration of sea and adjacent land uses in determining no-take areas

Source: Great Barrier Reef Marine Park Authority, 2002

Scientists were also involved in classifying the Park into 70 'bioregions' which had similar habitats, communities (such as areas of seagrass) and physical features (such as sediment type and depth).³³ The classification was based on 40 layers of data compiled from many years of research within the Park, regression tree analysis which spatially clustered areas with similar species composition, and a series of workshops.³⁴ Undertaking a technically robust *bioregionalisation* process, was identified by Park planners as a critical step in obtaining public credibility for the planning process, and in informing the subsequent development and placement of zones.³⁵

Information about human uses was also collated and mapped, including data on fishing, moorings and anchorages, boat ramps, shipwrecks, recreational activities and tourism use.

A *GIS system* was at the heart of the planning process. Biophysical and social/economic information was captured spatially in over 50 datasets. Specialised software was utilised to help select combinations of no-take areas which would meet the Biophysical Operational Principles while minimising negative

economic and social impacts (as reflected in the Social, Economic, Cultural and Management Feasibility Operational Principles). A series of analytical planning meetings were used to assess and refine possible areas for protection.³⁶

A series of *eight zones* were developed for incorporation into the new plan reflecting different levels of use. These included two no-take zones – the Marine National Park Zone and the Preservation Zone. A zone was also included for Scientific Research. Placement guidelines were developed for each of these zones. For example, the placement guidelines for the scientific research zone sought to include areas previously zoned for scientific research and the waters adjacent to major research institutions.³⁷

The preparation of the zoning plan involved two formal phases of *public consultation*. The first phase was undertaken over three months during mid 2002 and was designed to canvas the views of the public on the proposal to prepare a new zoning plan. The second phase involved a draft zoning plan being released for public comment, for two months, during mid 2003.

The public consultation process was extensive and included numerous community drop-in sessions, meetings, mail outs, a free-call telephone number, newspaper articles, advertisements and radio and television spots.³⁸

Over 31,500 submissions were received, demonstrating the wide public engagement in the preparation of the plan. A large number of the submissions presented spatial information including approximately 6,000 detailed maps. Many of these maps were captured on the project's GIS system.

What the plan contains

The zoning plan contains eight zones, each with different objectives, and corresponding restrictions on specific activities which can be undertaken within the zones (See Figure 10). The entire Marine Park was mapped indicating where the various zones apply. An example of a map for a portion of the Park is shown in Figure 11.

FIGURE 12: ZONING REGIME FOR GREAT BARRIER REEF MARINE PARK

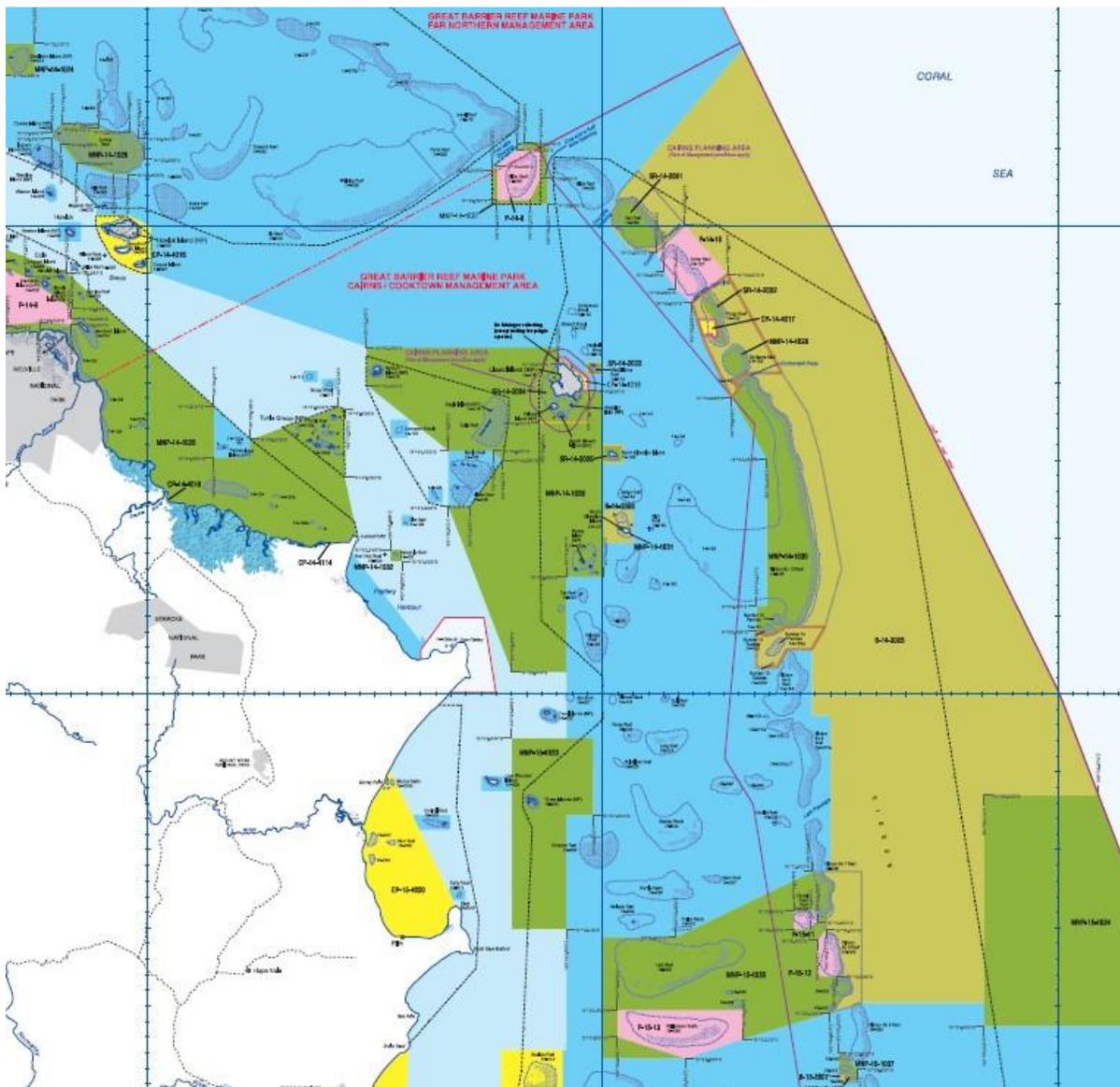
ACTIVITIES GUIDE (see relevant Zoning Plans and Regulations for details)	General Use Zone	Habitat Protection Zone	Conservation Park Zone	Buffer Zone	Scientific Research Zone 2	Marine National Park Zone	Preservation Zone	State Zoning only
								Esplanade Conservation Zone
Aquaculture	Permit	Permit	Permit 1	X	X	X	X	Permit
Bait netting	✓	✓	✓	X	X	X	X	✓
Boating, diving, photography	✓	✓	✓	✓	✓ 2	✓	X	✓
Crabbing (trapping)	✓	✓	✓ 3	X	X	X	X	✓
Harvest fishing for aquarium fish, coral and beachworm	Permit	Permit	Permit 1	X	X	X	X	X
Harvest fishing for sea cucumber, trochus, tropical rock lobster	Permit	Permit	X	X	X	X	X	X
Limited collecting	✓ 4	✓ 4	✓ 4	X	X	X	X	✓
Limited spearfishing (snorkel only)	✓	✓	✓ 1	X	X	X	X	✓
Line fishing	✓ 5	✓ 5	✓ 6	X	X	X	X	✓
Netting (other than bait netting)	✓	✓	X	X	X	X	X	✓
Research (other than limited impact research)	Permit	Permit	Permit	Permit	Permit	Permit	Permit	Permit
Shipping (other than in a designated shipping area)	✓	Permit	Permit	Permit	Permit	Permit	X	Permit
Tourism programme	Permit	Permit	Permit	Permit	Permit	Permit	X	Permit
Traditional use of marine resources	✓ 7	✓ 7	✓ 7	✓ 7	✓ 7	✓ 7	X	✓ 7
Trawling	✓	X	X	X	X	X	X	X
Trolling	✓ 5	✓ 5	✓ 5	✓ 5,8	X	X	X	✓

PLEASE NOTE: This guide provides an introduction to Zoning in the Great Barrier Reef Marine Park. Relevant Queensland Marine Park Zoning Plans or the Queensland Environmental Protection Agency should be consulted for confirmation of use or entry requirements.

- Restrictions apply to aquaculture, spearfishing and harvest fishing for aquarium fish, beachworm and coral in the Conservation Park Zone.
- Except for One Tree Island Reef (SR-23-2010) and Australian Institute of Marine Science (SR-19-2008) which are closed to public access and shown as orange, all other Scientific Research Zones are shown as green with an orange outline.
- Limited to 4 catch devices (eg. crab pots, dillies and inverted dillies) per person.
- By hand or hand-held implement and generally no more than 5 of a species.
- Maximum of 3 lines/rods per person with a combined total of 6 hooks per person.
- Limited to 1 line/rod per person and 1 hook per line. Only 1 dory detached from a commercial fishing vessel.
- Apart from traditional use of marine resources in accordance with s.211 of the *Native Title Act 1993*, an accredited Traditional Use of Marine Resources Agreement or permit is required.
- Pelagic species only. Seasonal Closures apply to some Buffer Zones.

Source: http://www.gbrmpa.gov.au/corp_site

FIGURE 13: ZONING MAP FOR FAR NORTHERN MANAGEMENT AREA



Source: http://www.gbrmpa.gov.au/corp_site/management/zoning/zoning_maps.html

Provision for traditional use and management

The Social, Economic, Cultural and Management Feasibility Operational Principles incorporated the need to consider the values and aspirations of traditional owners when identifying no-take zones (see above).

The Zoning Plan itself provides that traditional owners maintain access to all zones for non-extractive purposes. In addition, traditional fishing and collecting can be conducted “as-of-right” in all zones which allow for fishing and collecting by other users of the Marine Park. In other zones, traditional use is managed through Traditional Use of Marine Resources Agreements or permits. These agreements

describe how Traditional Owner groups will work with government to manage traditional use activities in sea country. They are developed by the Traditional Owner group and accredited by the Park Authority and the Queensland Environmental Protection Agency.

Lessons learnt

An article written by staff at the Park Authority identifies the lessons learnt from undertaking the rezoning exercise.³⁹ These include:

- The importance of developing a clear and transparent set of operating principles to guide the zoning exercise
- The importance of undertaking a robust bioregionalisation exercise which provides an essential foundation for subsequent marine zoning.
- The need for scientists and planners to work together in an iterative fashion. Data layers on their own will not lead directly to bioregionalisation or zoning.
- Appreciating that there is never perfect information or perfect boundaries. Use the best available information, make it widely available for public comment, and acknowledge that the plan can be improved over time
- Consensus is not achievable and no solution will totally satisfy all users and stakeholders
- People need to understand that there is a problem, before accepting that a solution is required, and many stakeholders have a poor understanding of the key issues. It is therefore important to educate and to tailor different messages for different audiences.

7 Florida Keys Marine Sanctuary Comprehensive Management Plan

The Florida Keys Marine Sanctuary covers a marine area of approximately 9,500 square kilometres. It contains extensive coral reefs, seagrass meadows and mangrove islands.

Around three million tourists visit the Keys annually, spending over US\$1.2 billion dollars. Recreational fishing is also a major activity contributing an estimated US\$500 million to the economy each year. Commercial fishing contributes a much smaller, but still sizeable, US\$57 million.⁴⁰

The Sanctuary was established in 1990 as a result of public concerns about deteriorating water quality, prospective oil drilling and multiple ship groundings in the area.⁴¹ It is managed by the federal National Oceanic and Atmospheric Administration in partnership with the Florida Department of Environmental Protection.

A *Sanctuary Advisory Council* has been established which consists of 20 members representative of commercial and recreational user groups (commercial and recreational fishermen, the dive industry, and the boating industry); conservation and other public interest organisations; scientific and educational organisations; and interested members of the public.

The first plan for the sanctuary was completed in 1996 and a revised plan was completed in 2007. The plan covers a wide range of issues of which zoning is only a small component.

Legal framework for plan

The *Florida Keys National Marine Sanctuary and Protection Act 1990* requires the preparation of a comprehensive management plan for the sanctuary (section 7). The purpose of the plan is to facilitate use of the sanctuary which is consistent with the primary objective of resource protection. The plan is required to consider temporal and geographical zoning “to ensure protection of sanctuary resources”. The plan is also required to identify priority needs for research, and to establish a long-term ecological monitoring programme and database, amongst other things.

How the plan was prepared

The plan was prepared by the National Oceanic and Atmospheric Administration. The zoning elements of the 1996 plan were developed through a process which included the following elements:

- Issues statements were developed, to help frame the problem, and these were informed by a public process

- Zoning workshops were held with different interest groups, to formulate a preliminary list of zone types, and these were further refined by the Sanctuary Advisory Council
- Strategy descriptions were then developed for each zone type
- A subcommittee of the Sanctuary Advisory Council was established to identify zone boundaries
- The subcommittee developed criteria for selecting candidate areas for each of the zones
- A subset of candidate areas were identified for further examination
- Benthic habitat maps, maps and information on activities, and use levels, and high-resolution aerial photography were used to consider potential boundaries.⁴²

A Draft Management Plan was publicly released in April 1995. Nine months was allowed for public review and comment and over 6,400 public submissions were received.

A review of the 1996 plan was commenced in early 2001 but engaged much less public interest. Sanctuary staff, in association with the Sanctuary Advisory Council, held public scoping meetings. Numerous revised drafts of the plan were prepared between 2001 and 2004. Only 30 public comments were received contrasting with the over 6,000 received in the 1996 plan preparation process. In early 2005 a draft revised management plan was published for public comment and only 20 comments were received. The plan was then finalised. It did not change the zoning established in the 1996 plan.

What the plan contains

The plan includes ten action plans, one of which relates to zoning. Others address issues such as education and outreach, research and monitoring, water quality and mooring buoys.

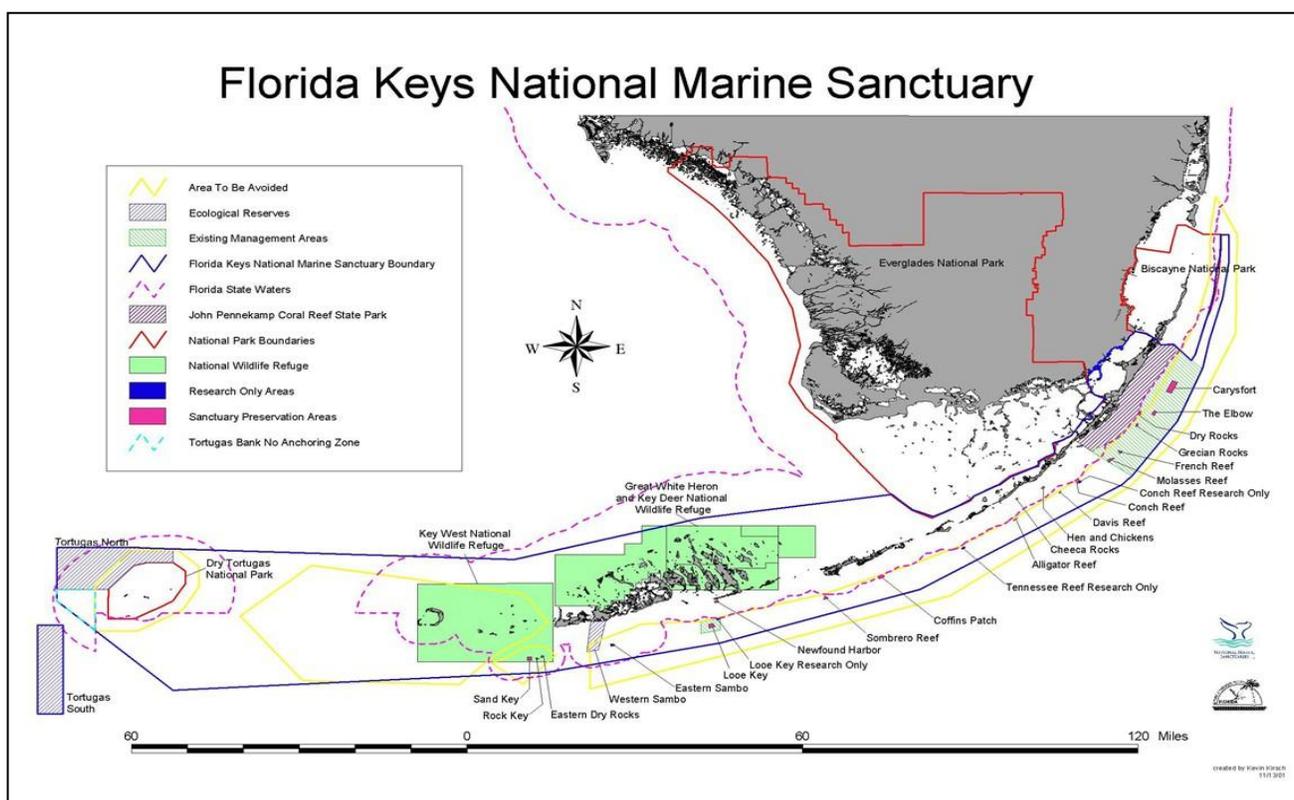
Five zones are located within a much larger unzoned area. Three of these are no-take zones (sanctuary preservation areas, special use areas and ecological reserves), which initially comprised less than one per cent of the sanctuary. The zones were:

- *Wildlife Management Areas* designed to minimise disturbance to especially sensitive wildlife populations and their habitats. Access restrictions include no-access buffer zones, no-motor zones, idle speed only/no wake zones, and closed zones (27 areas).
- *Ecological Reserves* designed to encompass large, contiguous and diverse habitats which provide natural spawning, nursery, and permanent residence areas for the replenishment and genetic protection of marine life (one reserve was established in 1996 of 23 square kilometres; and a second in 2000 covering 391 square kilometres).
- *Sanctuary Preservation Areas* which have high visitor numbers and where consumptive activities are prohibited (18 small areas protected totalling 17 square kilometres).

- *Special-use Areas* which are set aside areas for scientific research and educational purposes, restoration, monitoring, or to establish areas that confine or restrict activities such as commercial personal watercraft operations and moorings (four areas identified for scientific research and monitoring).
- *Existing Management Areas* are also included and identify areas that are managed by other agencies and where restrictions already exist (21 areas).

The location of the zones is shown in Figure 12.

FIGURE 14: LOCATION OF ZONES IN FLORIDA KEYS NATIONAL MARINE SANCTUARY



Source: National Oceanic and Atmospheric Administration, 2007

Lessons learnt

A review of the performance of marine zoning in the 1996 plan, undertaken by the Sanctuary Advisory Council, concluded that “marine zoning is one of the most immediately successful tools used by the Sanctuary for conservation and protection of threatened natural marine resources”. They also noted that “the Sanctuary’s zones have met with favourable response from the community, and many areas effect positive biological change inside their boundaries after just a short period of protection”.⁴³

8 Australian bioregional marine planning

Australia started to implement regional marine planning, based on large marine ecosystems, in the early 2000s. The original objectives for the regional planning exercise included determining areas which should be assessed for marine protected area declaration, identifying priorities for industry and economic development of the region, and putting in place a planning regime to prevent conflict between different sectors over resource access and allocation.⁴⁴

Achieving these objectives proved difficult in practice and the spatial component of plans has more recently focused on identifying conservation priorities and candidate marine protected areas. This means that the plans now focus on biodiversity conservation rather than on managing multi-use of marine resources.

The first bioregional plan prepared was for the south-east region, which covered an area of around two million square kilometres, at the junction of three major oceanic systems and bordering the coastlines of four States. The area includes many seamounts and is an important aggregation area for blue and southern right whales. Marine based tourism in the region was estimated as generating A\$2.6 billion in value-added services during the 2000 to 2001 year and fisheries production had an estimated gross value of A\$396 million in the 2002 to 2003 year.⁴⁵ The south-east regional plan was completed in 2004.

Other plans are being prepared for the south-west, north-west, north and east regions. They apply to Commonwealth waters, which in the main include the area extending three nautical miles from the coast, to the outer limits of the exclusive economic zone (200 nautical miles from shore). In its election manifesto for the August 2010 federal election, the Australian Labor Party committed to finalising the remaining marine bioregional plans by December 2011.⁴⁶

Legal framework for plan

Marine bioregional plans were initially developed outside any formal statutory framework, but within the ambit of the Commonwealth national oceans policy, which was released in 1998. In 2005 the plans were brought under section 176 of the *Environment Protection and Biodiversity Conservation Act 1999*. That section provides that a plan may include provisions about:

- The components of biodiversity, their distribution and conservation status
- Important economic and social values
- Heritage values of places
- Objectives relating to biodiversity and other values
- Priorities, strategies and actions to achieve the objectives

- Mechanisms for community involvement in implementing the plan
- Measures for monitoring and reviewing the plan

The plans take an ecosystem approach, and rather than just looking at single marine species or habitats in isolation, consider “their linkages, the role they play within the marine environment and their relationships with human activities.”⁴⁷

The plans do not have the status of regulations, but the Commonwealth Minister for Environment and Heritage must have regard to a bioregional plan when granting environmental approvals under the Environment Protection and Biodiversity Conservation Act. These approvals are required for “matters of national environmental significance” which include all activities which are likely to have a significant impact on the environment of Commonwealth marine areas.

The National Oceans Office is the lead agency for the preparation of the plans. The National Oceans Office, which was established in 1999, was originally an independent agency. It has since been incorporated into a Marine Division of the Department of the Environment, Water, Heritage and the Arts. The plans are approved by the Commonwealth Minister for Environment and Heritage.

A *National Oceans Advisory Group*, established in 1999, oversees the marine planning programme. It consists of sectoral representatives from industry, science and conservation who have expertise in marine issues.

An *Oceans Policy Science Advisory Group* was established in 2003 to provide advice to government, set priorities for marine science, and to share information. In 2009 the Group released a national framework for marine research and innovation.⁴⁸

How the plan was prepared

The preparation process for the south-east regional marine plan included the following three broad stages:

- *Scoping phase* in which the objectives for the planning process were defined, as well as the nature of the assessments
- *Assessment phase* which involved six assessment streams: biological and physical; indigenous; management and institutional arrangements; impacts on the natural system; uses; and community and cultural values.
- *Options development* which included consultation with sectoral interests as well as key stakeholders, Indigenous communities and state governments

The initial stages of the planning process were dominated by a significant effort to generate and analyse data. Considerable resource was put into bioregionalisation, a process designed to characterise the ocean into different habitat types. This then enabled planning units to be delineated and a better

understanding of ecosystem functions and linkages to be developed. Resources were also deployed to map present uses of the ocean.

A simplified plan preparation process has now been developed for the other bioregional plans and this includes the following three main stages

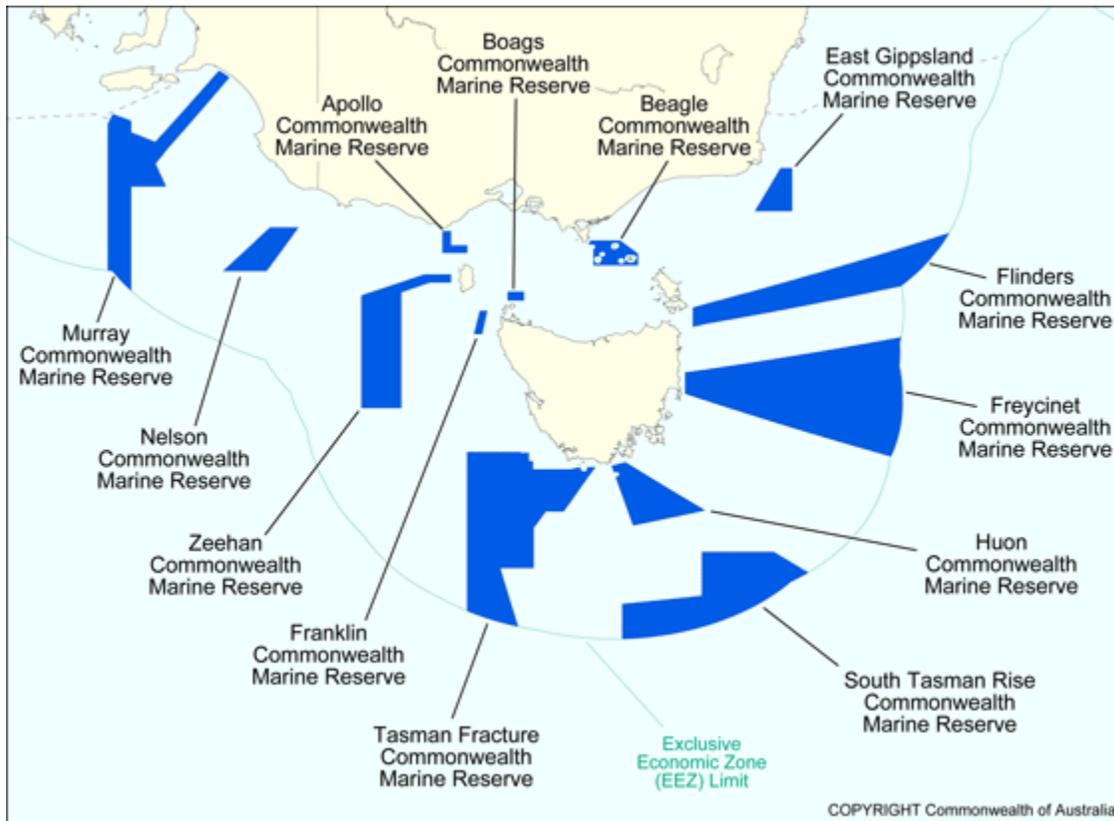
- The development of a regional profile for each marine region
- Identification of *Areas for Further Assessment* where more detailed analysis will be carried out to identify a network of marine reserves
- The development of a draft plan including a proposed network of marine reserves
- The finalisation of the bioregional plan after public consultation on the draft plan

Content of the plan

The south-east regional plan was released in 2004 and took the form of an action plan rather than a spatial plan. It largely consisted of descriptions of the environmental, economic and social characteristics of the region, ocean uses, current initiatives and action plans.

The plan did have some spatial elements. Existing uses such as petroleum licences, commercial fishing, aquaculture and shipping routes were shown on maps. Native title applications were also mapped. Broad areas of interest for marine protected areas were identified as well as the proposed boundaries of candidate marine protected areas within them. These areas were subsequently refined, and 13 new marine reserves created, as shown in Figure 13.

FIGURE 15: MARINE RESERVES IDENTIFIED IN SOUTH-EAST REGIONAL PLAN



Source: National Oceans Office, 2004

The content of future marine bioregional plans are to include:

- A bioregional profile which describes the region's key habitats, plants and animals, natural processes, human uses and benefits, and threats to the long-term ecological sustainability of the region
- Detailed description of the various statutory obligations that apply to the region
- Identification of regional priorities for protection of conservation values, based on an appreciation of threats
- Identification of a network of marine protected reserves
- Identification of how environmental quality and condition of the area will be monitored in the future.

Provision for traditional use and management

The 20-member National Oceans Advisory Group has one representative of Indigenous People.

The process to develop the south-east regional plan included the piloting *Sea Country Plans*. The plans were intended to facilitate Indigenous involvement in natural resource use and development processes (see Figure 14).

FIGURE 16: ROLE OF SEA COUNTRY PLANS

Intended to enable Indigenous peoples to:

- Consider and plan their interests and responsibilities relating to the use and management of marine areas with which they are culturally associated
- Negotiate with other marine managers and users to develop policies and institutional arrangements that are respectful of Indigenous people's rights, interests, responsibilities in Sea Country
- Seek resources and other support to enable Indigenous people to use and manage their Sea Country according to their rights, interests and responsibilities

Source: National Oceans Office, 2004, 69

A pilot sea country plan was developed in collaboration with the Gunditj Mara people who have a strong and long-standing association with the coast and marine resources. In particular, they have a strong focus on the utilisation of the short-finned eel.⁴⁹ The process of preparing the plan was funded by the National Oceans Office and was facilitated by independent consultants. It resulted in the completion of the *Kooyang sea country plan* in 2004.

The plan sets out a vision for the involvement of the Gunditj Mara people in management of their marine area as follows:⁵⁰

We, the Maar (Aboriginal) people of South-west Victoria, carry out our enduring responsibility to actively manage and protect our marine and associated land based resources. We benefit from enterprises based on the sustainable use of these resources and work in partnership with others to restore the health of the environment on which we all depend.

The plan then identifies objectives and strategies for key issues including participation in decision making, commercial and economic opportunities, cultural heritage, environmental protection, research needs and implementation support.

The preparation of the pilot sea country plan was considered a success by the National Oceans Office and four more have since been developed.

Lessons learnt

A 2005 evaluation of the Australian national oceans policy initiative, including the preparation of the south-east region marine plan, identified the following lessons which can be learnt:⁵¹

- Stakeholders need to be clear about what the plan will deliver and how it will add value
- The data-gathering phase needs to be guided by clear management objectives, otherwise it becomes a 'data mining' exercise which consumes significant resources without necessarily informing management decision-making
- There needs to be a clear framework for public consultation and a clear strategy for analysing input and incorporating it into the decision-making process. Stakeholders need to have input into key strategic issues as well as detailed design issues during different phases of the project.
- It is important to engage all statutory agencies with a role in marine management early on in the process
- The planning process can mobilise scientific effort to better understand the marine environment
- The planning process can significantly improve stakeholders' knowledge of marine management issues, and enable them to better understand each other's point of view
- The planning process can develop expertise in management agencies and help develop a cadre of officials with expertise in integrated marine planning and management.

9 Eastern Scotian Shelf Integrated Oceans Management Plan

The Eastern Scotian Shelf and Slope encompass some 325,000 square kilometers of ocean. The area includes a wide diversity of marine life and habitats including banks, basins and submarine canyons. It is a large marine system which provides important habitat for species at risk, including the northern bottlenose whale, the leatherback turtle and the North Atlantic right whale.⁵²

The Eastern Scotian area is also used for oil and gas extraction, commercial fishing, traditional fishing, shipping and defence. There are about 78,000 square kilometres of oil and gas lease areas and the rapid development of this industry was one of the main triggers for the Eastern Scotian Shelf Integrated Management (ESSIM) initiative.⁵³

The ESSIM initiative started in late 1998, with a an integrated management plan with no spatial management implications, being completed in 2007.

Legal framework for the plan

The plan was prepared under the *Oceans Act 1997*. The Act requires the Minister to “lead and facilitate the development and implementation of plans for the integrated management of all activities or measures in or affecting estuaries, coastal waters and marine waters that form part of Canada or in which Canada has sovereign rights under international law” (section 31). The Minister is also to lead and coordinate the development and implementation of a national system of marine protected areas for the purposes of integrated management plans (section 35).

How the plan was prepared

The plan was developed using a collaborative planning model. This included four main bodies:⁵⁴

- *ESSIM Forum* – which was a broad assembly for all stakeholders. The Forum met twice a year and members were kept informed through regular e-newsletters and web-based information
- *Stakeholder Advisory Council* – which help to provide overall direction for the project. It included 32 members from a wide range of conservation and community groups, academics, government agencies, Aboriginal peoples and user sectors.
- *Federal-Provincial ESSIM Working Group* – which was an intergovernmental forum of ocean-related agencies
- *Regional Committee on Ocean Management* – a senior executive-level forum for ocean-related agencies

The planning process itself was led by an ESSIM Planning Office housed within the Oceans and Coastal Management Division of Fisheries and Oceans Canada. In 2004, partway through the plan development process, a marine protected area (the Gully) was established within the planning area.

Initial work on the plan concentrated on the collection and mapping of data from different sectors, with a focus on natural science data. This work included assessing contaminants, mapping benthic communities, undertaking zooplankton and nutrient studies, carrying out an inventory of existing marine environmental quality standards and guidelines, identifying ecosystem objectives and indicators, mapping key ocean activities and assessing noise levels and potential impacts on whales.

Supporting work for the eventual identification of marine protected areas was also undertaken, including developing a systematic approach to mapping, classifying and assessing marine ecosystems and defining sensitive and important areas in terms of ecological parameters and the nature of human impacts.

Content of the plan

Fisheries and Oceans Canada initially envisaged that the plan would include ocean use planning measures, such as zoning to address multiple ocean use, but this did not eventuate in practice.⁵⁵ It was also envisaged that a comprehensive plan would be developed for the selection and prioritisation of marine protected areas within the region but this also did not come to fruition.⁵⁶

Even after eight years of preparation, the plan failed to include a spatial element and consists only of high level objectives and strategies. Actions to implement the strategies have yet to be defined. The one spatial element to come out of the planning process was the designation of the Gully as a marine protected area.

The project did incorporate mapping of biophysical information and human activities but the results were not incorporated into the plan. The ESSIM Planning Office is completing a GIS-based atlas which will include this data.⁵⁷

Provision for traditional use and management

Two members of the 32 member Stakeholder Advisory Council were Aboriginal peoples. Relevant strategies identified in the plan include:

- Involving Aboriginal peoples in planning and management decisions. This is to be achieved through approaches such as translating documents into Mi'kmaq, ensuring that public meetings and workshops are held in accessible locations, and ensuring the decision-making processes are open, transparent, and responsive to the concerns of Mi'kmaq peoples and all communities of interest.
- Promoting the use of and access to traditional knowledge, including Aboriginal/Indigenous knowledge, through implementing programs to research and disseminate traditional ecological knowledge related to marine ecosystems.

- Identifying and implementing measures to improve retention of wealth and benefits within coastal and Aboriginal communities in Nova Scotia and Canada.

Lessons learnt

The collaborative-based process encountered some significant problems. Some sectors and agencies failed to attend meetings and the fisheries sectors dominated meetings. For some sectors the resource costs of participating in multiple meetings was too high.⁵⁸

A review of the ESSIM project in 2005 identified a number of positive outcomes:⁵⁹

- Improved understanding about the Eastern Scotian Shelf and improved data sharing amongst government departments and other organizations
- The establishment of a multi-stakeholder forum and process for discussing and addressing conservation issues
- A more integrative and collaborative management approach being adopted by sectoral agencies
- The development of positive expectations that ESSIM will lead to more efficient and timely management and regulation as a result of the clarification of management roles and jurisdictions

Difficulties identified with the ESSIM Project have included:⁶⁰

- Difficulty in overcoming entrenched positions and mistrust among stakeholders
- Limited capacity of stakeholder groups to effectively participate in the initiative
- Difficulty in effectively coordinating government agencies, with ESSIM being regarded as a Department of Fisheries and Oceans initiative, and other agencies facing dwindling budgets and being concerned with operating under their separate legal mandates
- Lack of clear policy targets for the initiative which led to the entrenchment of the status quo, and lack of clarity as to what the resultant plan would look like or achieve
- Slow process in designating marine protected areas and lack of any regulations under the Oceans Act defining what they should look like, how big they should be, or what restrictions should be put in place
- Difficulty adapting to the speed at which oil and gas exploration and development and other industrial pressures were proceeding, and failure to establish marine protected areas before conservation opportunities were foreclosed

In their review of integrated ocean management initiatives in Canada, published in 2007, Guénette and Alder concluded:⁶¹

- Decision-making by consensus can be problematic and there needs to be a mechanism to decide the outcome
- Adequate funding is crucial for progress to be made
- It takes a long time to obtain agreements between different agencies. This is particularly the case when agencies have their own narrow mandate and are involved in promoting economic activities.
- Compiling ecological and socioeconomic data is only the first part of the information process. Subsequent consultation and consensus-building takes considerable time.
- In areas where stakes are high, or issues are complex, it is harder to keep stakeholders involved and negotiations take much longer
- Resource needs to be allocated to build capacity for local groups, small-scale industries and First Nations to participate fully in decision making processes
- The major opponent was the fisheries sector, which had close links to the Department of Fisheries and Oceans, the agency managing the plan development process.

10 Massachusetts Ocean Plan

The Massachusetts Ocean Plan encompasses more than 6,859 square kilometres of ocean. The seaward extent of the planning area, is aligned with the state government jurisdiction, and is generally three nautical miles offshore. The landward limit is largely 0.3 nautical miles seaward of mean high water, which means that it excludes harbours and ports.⁶²

Coastal tourism and recreation in the area, including recreational fishing and boating, contributed US\$8.7 billion to the economy in 2004. The economic contribution of the commercial seafood sector, in the same year, was a much smaller US\$1.6 billion. This included 374 aquaculture farms worth an estimated US\$6.3 million in sales.⁶³

Legal framework for plan

The Massachusetts Ocean Act 2008 requires the Secretary of Energy and Environmental Affairs to develop an integrated ocean management plan for the area by 31 December 2009 (section 4C). Once the plan is adopted, all consents for development and activities for the area which are subject to the plan, “shall be consistent, to the maximum extent practicable, with the plan”.

The Act requires the plan to contain goals, siting priorities and standards for specific uses. The plan must also identify and protect special, sensitive and unique estuarine and marine life and habitats. The plan does not govern fisheries, which is controlled by a different agency.

The legislation also created an Ocean Advisory Commission and Science Advisory Council. The *Ocean Advisory Commission* consists of 17 members including legislators, agency heads, representatives from commercial fishing and environmental organisations, an expert in offshore renewable energy and representatives from coastal regional planning agencies. The Committee helped analyse comments generated through the public participation process, provided input into establishing goals, strategies and outcomes for the plan and reviewed proposed management approaches.

The *Science Advisory Council* consists of nine scientists with expertise in marine science and data management. The Council reviewed data sources and identified additional data, assisted with the development of the baseline assessment and characterisation of the marine area, established a set of core indicators for environmental health, and helped to formulate a long-term strategy for addressing information gaps.

The plan preparation process was managed by the Office of Coastal Zone Management on behalf of the Secretary of Energy and Environmental Affairs.

How the plan was prepared

The Office of Coastal Zone Management established a core group of agency representatives which formed the core planning group. These included people from the Office of Coastal Zone Management, the Department of Environmental Protection, the Department of Fish and Game and the Division of Marine Fisheries. A subset of this group focused on developing the management and regulatory measures in the plan.⁶⁴

A key stakeholder in the plan preparation process was the *Massachusetts Ocean Partnership*. This was an independent organisation of ocean stakeholders funded by the Gordon and Betty Moore Foundation. The Partnership provided financial and technical assistance with research, data analysis and stakeholder engagement.⁶⁵

The development of the plan went through a number of phases:

Phase 1: Acquire data, information and public comment

The plan preparation team established a dedicated website, held 18 “listening” sessions which more than 300 people attended, two data workshops where draft work group maps were presented, more than 80 meetings with stakeholder groups and individuals, and workshops to discuss preliminary findings and proposals.⁶⁶

The team also established ocean use and resource work groups for habitat; fisheries; renewable energy; transportation, navigation and infrastructure; sediment; and recreation and cultural services. These focused on gathering spatial data and information. The work group reports provided the backbone of the plan.

Other information was acquired through meeting with commercial fishermen, undertaking a survey of recreational fishing, obtaining maps of recreational activity and compiling information from vessel monitoring systems.

The *Habitat Work Group* was tasked with identifying, characterising and ranking priority areas for marine life and habitat. For a period of three months the Group met nearly every week to discuss scientific data. They were informed and advised by people with first-hand knowledge of the data, who would attend meetings as required.⁶⁷

The Group undertook this work based on three “tracks”:⁶⁸

- Areas/resources with special legal protection.
- Habitat critical to or providing specific life-stage support for important species (or group of species, such as guilds or assemblages). This included sightings of marine mammals; areas of high use by marine bird species (nesting, foraging, staging); eelgrass and kelp beds (although kelp was ultimately not used as data was not available); and diadromous fish runs.

- Unique and/or sensitive habitats as indicated by abiotic parameters (depth, topography and sediment grain size).

Other work groups constructed maps for specific activities such as navigation; fisheries resources and fishing effort; location of infrastructure; archaeological resources; and areas suitable for wind energy.

Phase 2: Synthesis and integrate into working plan, conduct additional stakeholder meetings

The plan was developed through initially developing a *set of goals and strategies*, based on the Oceans Act, which would provide decision-making guidance in analysing the data. Four goals were identified: integrated ocean management; good stewardship – protection of the marine ecosystem; good stewardship – human use of the marine ecosystem; and an adaptive foundation for ocean management in the future. These goals were then further developed to identify outcomes that the oceans plan needed to achieve to attain the goals and “findings” which summarised conditions, issues and desired future conditions to give guidance to the selection of particular strategies.⁶⁹

A compatibility assessment was the undertaken, to identify the extent to which activities were incompatible with each other, and with marine resources. An understanding of the specific siting and operational requirements of the individual activities was developed and then an analysis undertaken of the nature and duration of likely impacts to natural resources or other activities. This enabled the identification of two categories:⁷⁰

- Resources or activities subject to likely or significant incompatibility or impact
- Resources or uses subject to potential incompatibility or impact

An example of the output of the compatibility assessment is shown in Figure 15.

This assessment was based on “best professional judgement”. It was then correlated with the various data layers to provide a planning a tool for further assessment of options. Activities and important natural resources were mapped by category of potential incompatibility or impact to identify conflicts which would need to be managed. This also enabled the identification of areas suitable for large-scale wind energy development.

Three general management options to address the conflicts were then considered:⁷¹

- *Regulate on a case-by-case basis* (status quo) – this would be the most flexible approach but would not achieve integrated management.
- *Designate specific areas for use by individual activities* based on the data assembled and compatibility assessment undertaken – this approach would significantly increase protection for natural resources but would have limited flexibility and be difficult with available levels of data.
- *Apply a hybrid approach* which included designating some areas for uses with potentially significant impacts where good data is available, and identifying exclusionary areas, where natural resources

and activities are likely to have significant incompatibility where data is limited or where the spatial location of activities is uncertain. This was identified as the best option because it provided some protection and also significant flexibility.

FIGURE 17: EXAMPLE OF OUTPUT OF COMPATIBILITY ASSESSMENT

Table 3-3. Compatibility assessment for extraction of sand and gravel for beach nourishment (simplified for illustrative purposes)

Siting requirements	Typical Impacts	Planning criteria: significant incompatibility	Planning criteria: potential incompatibility or impact
Seafloor areas with sand or gravel with grain-size compatible with beach to be nourished	Disruption and displacement of benthic life and permanent physical alteration of benthic habitat; displacement of existing water-dependent uses during extraction operations	Eelgrass	Areas of concentrated recreational fishing activity

Source: Executive Office for Energy and Environmental Affairs, 2009a, 3-14

Siting and performance standards were developed for specific activities based on their potential impact on individual species or unique areas of marine and estuarine life and habitats. Similarly, management guidance for balancing impacts on commercial and recreation fishing and recreational boating were developed and the compatibility of these with new activities was assessed.

Phase 3: Formal legislative review and public hearings, promulgation

Copies of the draft plan were made available for public review and five formal public hearings were held. More than 300 comments were received and these were compiled and reviewed. The Massachusetts Ocean Management Plan was then revised and finalised for promulgation on 31 December, 2009.

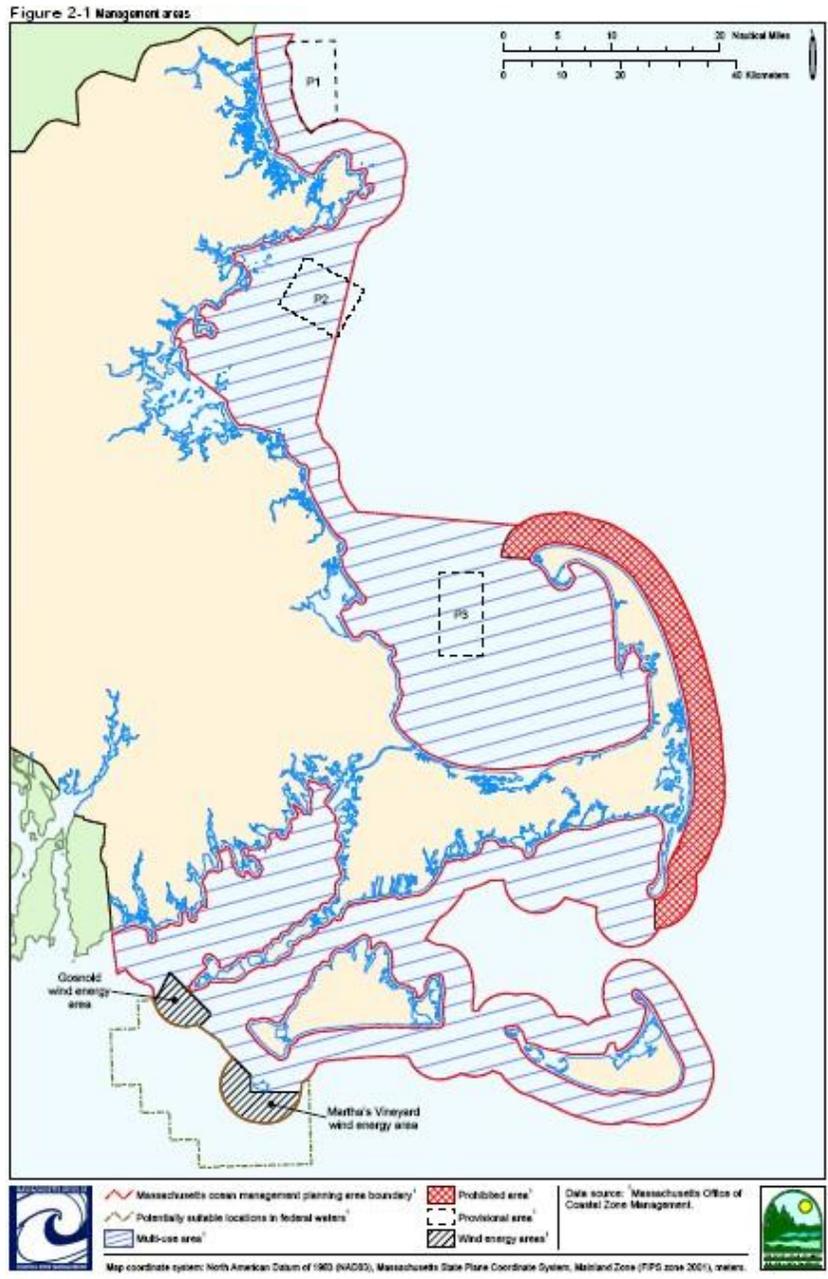
What the plan contains

The plan contains three types of management areas:

- *Prohibited* – which coincides with the Cape Cod Ocean Sanctuary
- *Renewable Energy* – which allows commercial and community-scale wind energy development.
- *Multi-Use* – which is open to most uses, activities and facilities.

These areas were shown on a map (see Figure 16).

FIGURE 18: MASSACHUSETTS OCEAN PLAN MANAGEMENT AREAS



Source: <http://www.env.state.ma.us/eea/mop/final-v1/figs/print/2-1-print.pdf>

Management in the Multi-use Area is based on siting and performance standards, which are linked to mapped resources and uses. These are designed to direct development away from high value resources and concentrations of existing water-dependent uses (fishers and recreational boaters). An example of the standards applied to sand mining is shown in Figure 17 below.

FIGURE 19: SITING AND PERFORMANCE STANDARDS FOR SAND AND GRAVEL EXTRACTION

Table 4-5. Siting and performance standards for the extraction of sand and gravel (See Figure 4-22.)

Allowed Use	Siting Standard	Performance Standard	Natural Resource or Water-Dependent Use
Sand and gravel	Avoid, or demonstrate that there is no less damaging practicable alternative, or demonstrate that data does not accurately characterize resource or use	Meet all applicable permitting standards; minimum baseline standard is avoid, minimize, and mitigate impacts to the maximum extent feasible	<ul style="list-style-type: none"> • North Atlantic Right whale core habitat area • Roseate tern core habitat • Fin and humpback whale important habitat • Areas of hard/complex seafloor • Eelgrass and inter-tidal flats (Clean Water Act Special Aquatic Sites) • Important fish resource area
	Avoid, minimize, and mitigate impacts		<ul style="list-style-type: none"> • Areas of concentrated recreational fishing • Areas of high commercial fishing effort and value

Source: Executive Office for Energy and Environmental Affairs, 2009, 2-18

The plan includes maps showing the location of various important resources and activities including:

- North Atlantic Right Whale Core Habitat
- Humpback Whale Important Habitat
- Fin Whale Important Habitat
- Roseate Tern Core Habitat
- Special Concern (Arctic, Least, and Common) Tern Core Habitat
- Long-tailed Duck Important Habitat
- Leach’s Storm Petrel Important Nesting Habitat
- Colonial Waterbirds Important Nesting Habitat
- Areas of Hard/Complex Bottom
- Eelgrass
- Intertidal Flats
- Important Fish Resource Areas
- Areas of High Commercial Fishing by Effort and Value
- Areas of Concentrated Recreational Fishing
- Areas of Concentrated Commerce and Commercial Fishing Traffic
- Areas of Concentrated Recreational Boating Activity

The plan was accompanied by a Monitoring Framework and a Science Framework which included a description of the specific science and data necessary for future oceans management. It included identification of projects, the timing, the lead agency, partners, source of funding and a measure of whether objectives would be fulfilled.

Provision for traditional use and management

One person on the 49-member Ocean SAMP Stakeholder Group was a Tribal Historic Preservation Officer for the Narragansett Indian Tribe and an additional member was from the Narragansett Indian Tribal Historic Preservation Office.

11 Rhode Island Ocean Special Area Management Plan

The Rhode Island Ocean Special Area Management Plan covers a marine area of around 3,800 square kilometers located off the coast of the USA state of Rhode Island. It includes both state and federally managed marine areas. The area is heavily used for recreational boating, commercial and recreational fishing and shipping. It is located on the convergence of two bio-geographic areas and is important for migratory fish, marine mammals, birds and sea turtles.⁷²

The key impetus for preparing the plan was the interest in developing off-shore wind farms in the area. Spatial planning was seen as a tool which could be used to optimise the locations of these structures.

Legal framework for plan

The plan was prepared under the auspices of the federal *Coastal Zone Management Act 1972*. This legislation is designed to encourage states to develop coastal zone management programmes by providing matching federal funding for their implementation. Special area management plans (SAMPs) are identified in the legislation as a mechanism for achieving coastal zone enhancement objectives (section 309(a)(6)). Under the legislation, applicants for federal licences or permits are required to be consistent with the state's coastal zone management plan.

The plan was prepared by the Rhode Island Coastal Resources Management Council which is the state government's regulatory agency for the coastal area. The University of Rhode Island was closely involved in the plan management team providing several senior advisors and researchers. The plan was completed in October 2010.

How the plan was prepared

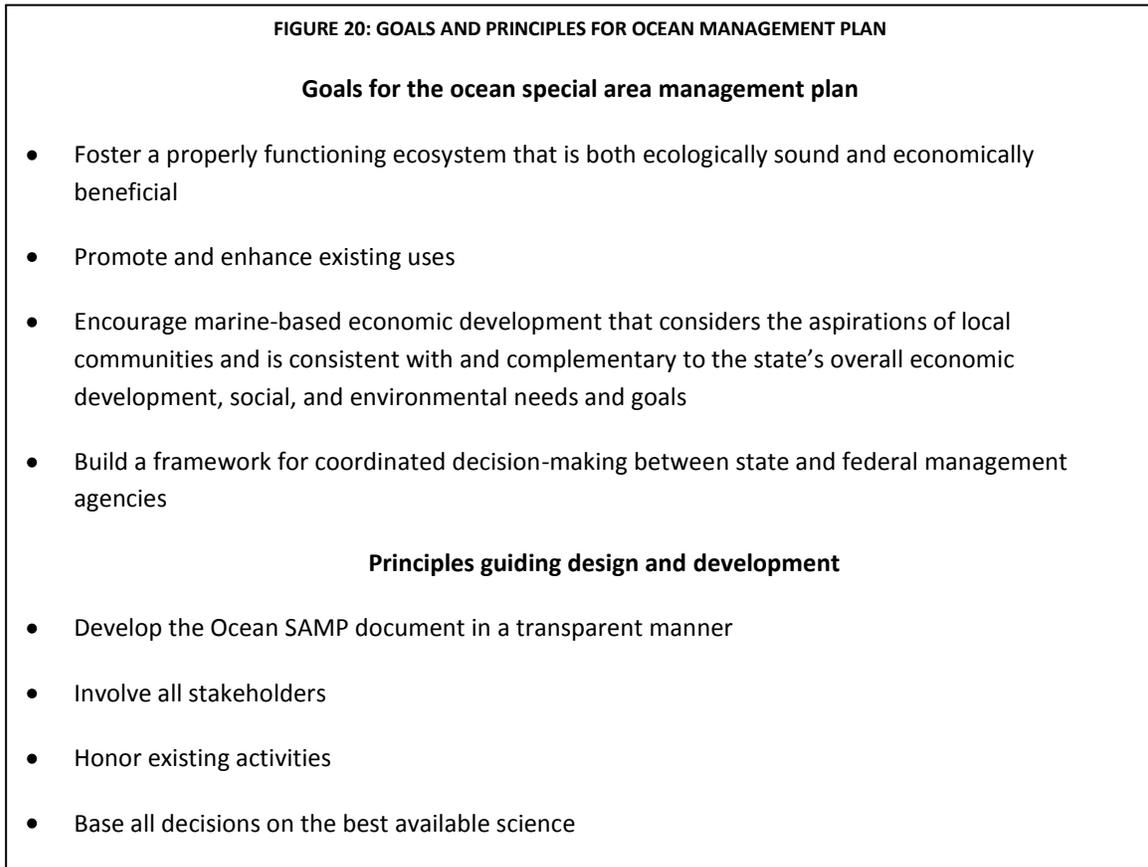
An *Ocean SAMP Stakeholder Group* was established for the planning process, and had an independent chair. The Stakeholder Group met monthly, holding a total of 17 meetings during the planning process. The meetings generally began with an update on the project's progress, followed by a presentation of the findings of technical and scientific work, and then an open discussion of stakeholders' issues and concerns.⁷³

The Stakeholder Group refined and approved the goals and principles initially established for the plan. They received a comprehensive overview of the ecology and human use of the area. They then considered and commented on each draft chapter of the plan. The Stakeholder Group reviewed material but was not asked to formally accept or reject it.

A *Science Advisory Task Force* was established to provide expertise and input into the science and research-based elements of the plan. The Task Force included scientists from a range of relevant areas and met periodically during the plan development process.⁷⁴

Separate *Technical Advisory Committees* was established for each chapter of the plan. Membership included scientists, government agency representatives and resource users with expertise in the chapter topic. The committees focused on improving and refining the content of each chapter.⁷⁵

A set of goals and principles were developed to guide the plan development process as shown in Figure 18.



Source: Rhode Island Coastal Resource Management Council, 2010

What the plan contains

The spatial element of the plan includes the three broad ‘zones’ within the overall oceans area. The *Renewable Energy Zone* is the preferred site for large scale renewable energy projects in state waters. Where a project wishes to locate outside these areas it must be shown to have no significant adverse impact on natural resources or human uses.

A number of *Areas of Particular Concern* have been identified and mapped. These include:

- Historic shipwrecks, archeological or historic sites and their buffers
- Offshore dive sites
- Glacial moraines which are important habitat areas for fish (see Figure 19)

- Navigation, Military and Infrastructure areas including designated shipping lanes and anchorages
- Areas of high fishing activity
- Heavily used recreational boating and sailboat racing areas
- Naval Fleet Submarine Transit Lanes

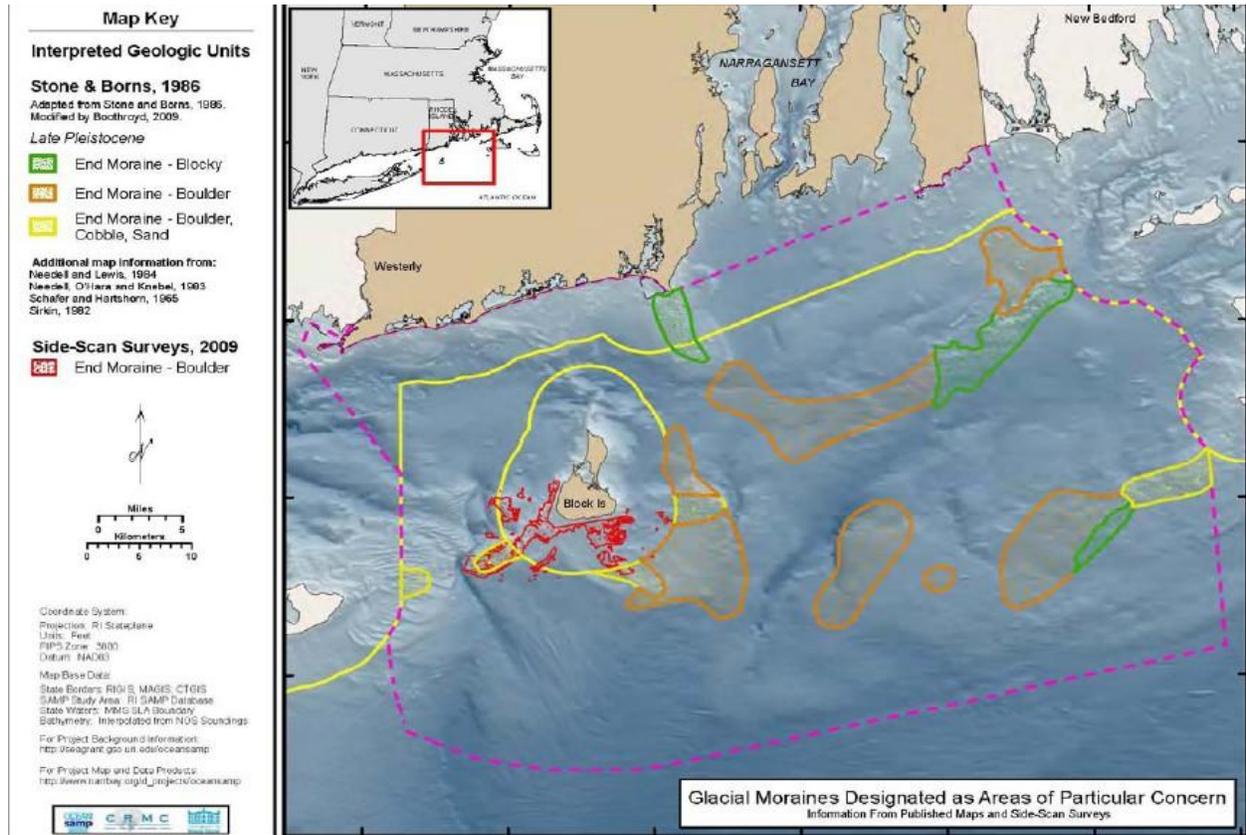
Applications for offshore developments are required to avoid Areas of Particular Concern. Where they cannot be avoided, the applicant must minimise to the greatest extent possible any impact and mitigate any significant impact. Applicants are also required to demonstrate why these areas cannot be avoided or why no alternatives are available.

Areas Designated for Preservation have also been identified as needing protection for their ecological value. These include sea duck foraging habitat. Large scale offshore development, mining or other development which is in conflict with the “intent and purpose” of an Area Designated for Preservation is prohibited.

The plan is to be accompanied by a *Science Research Agenda* and a *Progress Assessment and Monitoring Process*. This monitoring system will be designed to “record decisions, capture lessons learned, note achievements, and document policy and management adaptations. This process will be ongoing, available on the project web sites, and formally reported to the public on a biannual basis”. The oceans plan itself will undergo a major review every five years.

In order to maintain stakeholder engagement with the implementation of the plan, it is also planned to hold an *Ocean SAMP Public Forum* every two years. The public forum will highlight projects underway, report on new research findings, review progress towards goals and objectives and recognise contributions to the plans implementation. The Forum will also address emerging issues and any needed changes to the plan.⁷⁶

FIGURE 21: MORAINES PROTECTED AS AREAS OF PARTICULAR CONCERN



Source: Rhode Island Coastal Resources Management Council, 2010

12 Belgian North Sea Master Plan

This plan applies to the Belgian part of the North Sea which encompasses a relatively small area of around 3,600 square kilometers. The area is heavily used for shipping, fishing, military exercises, recreation, sand and gravel extraction and aquaculture. Impetus for the development of a marine spatial plan came from the prospective development of offshore energy production (off shore wind farms are now operational in Belgium) as well as from the need to identify and protect conservation areas to meet the requirements of the European Union Birds and Habitats Directives.⁷⁷

There has been a long history of marine research in Belgium which provided a good information base for marine spatial planning.⁷⁸ A Master Plan for the Belgian North Sea has been under development since 2003. In 2004, Phase One of the Master Plan became operational and this addressed locations for sand and gravel extraction and wind farms. Phase Two of the Plan became operational in 2005 and identified nature conservation areas.

At the same time as the development of the Master Plan, a group of university research teams undertook a spatial planning project for the same planning area, referred to as the GAUFRE Project.

The Belgian government is currently exploring a complete revision of the existing Master Plan to improve sustainable use and protection. At the European Union level, new requirements are being put in place for the future development of marine spatial plans in all waters around Europe.

Legal framework for the plan

There is no current legal framework for the Master Plan. However, in 1999 Belgium enacted the “Law on the protection of the marine environment in marine areas under Belgian jurisdiction on the marine environment”. This created a licencing and environmental impact assessment system for a range of marine activities. The legislation formed the basis for the marine spatial plan and enabled the creation of marine protected areas.

In 2003, the Vice Prime Minister was given specific competence for the North Sea and initiated the development of a Master Plan.⁷⁹ The Plan has been implemented in an incremental manner.

How the plan was prepared

The preparation of the Master Plan involved stakeholder consultation and socio-economic and ecological studies. During Phase 2 of the plan development, which focused on the identification of marine protected areas, strong emphasis was placed on stakeholder consultation.

The Minister’s staff first prepared draft maps which delineated spawning grounds, fishing areas and initial proposals for the location of marine protected areas. They also prepared a list of potential protective measures for the prospective protected areas. The Minister then held confidential meetings with different stakeholder groupings including officials from a range of departments, scientists and civil

society. The proposed delineation of the marine protected areas was consulted on separately to the proposed measures which might be put in place to protect the areas.⁸⁰

As part of the consultation process, the Minister personally visited fisherman, coastal mayors and water sport enthusiasts in order to gain support and legitimacy for the process. One of the selling points presented to fisherman was the potential for marine protected areas to protect fisheries nursery grounds.⁸¹

In developing measures to protect the delineated marine protected areas the Minister opted for a mix of formal and informal rules including “voluntary user agreements”. These user agreements allow a specific group of stakeholders to use a marine protected area subject to agreed conditions set out in the agreement. The users are required to maintain the natural habitat and protect species, to comply with any regulations in force, and to actively inform their members and customers of the requirements. If the stakeholders repeatedly violate the agreements that Minister can unilaterally cancel them.⁸²

The university-led GAUFRE project was much more comprehensive and involved a scenario development exercise. The methodology was drawn from Flemish spatial land-use planning.⁸³ One of the first steps undertaken was to divide the planning area into 76 ecologically and geophysically homogenous zones. For each of these zones the infrastructure and historic, current and future uses were described. This data was then entered into GIS to create a database of layered marine environmental information.⁸⁴

The GIS layers were then utilised to analyse possible compatibilities and interactions among the environment, infrastructure and uses. The process included:⁸⁵

- *Suitability analysis* – the extent to which a particular space is appropriate for allocation to a certain use (based on legal, technical, socio-economic and ecological constraints)
- *Interaction between uses and the environment* – the likely environmental impacts of a use including physical, chemical and ecological impacts
- *Interaction among uses* – how different uses would be likely to respond to a newly introduced use

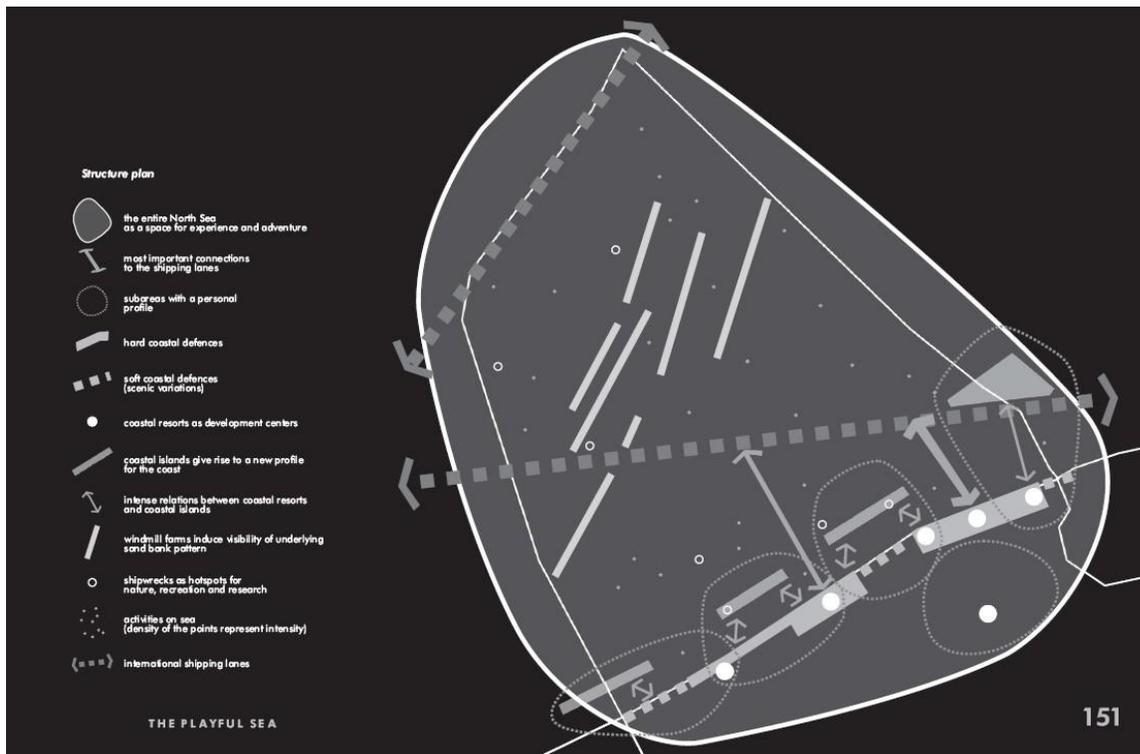
A series of *structural maps* (which are much more schematic than GIS maps) were then developed to provide a strategic vision of the potential and desired spatial development for a particular area. These structural maps were used to generate various scenarios for potential futures.

Each potential activity was associated to a different degree with three key values:

- *Well-being* - the potential value that society places on the area for recreation
- *Ecological and Landscape value* – which encompasses the natural and heritage wealth of the area
- *Economic value* – which recognises the financial goods and services provided by the area

These three values were used to create the “parameter-space” for six scenarios. Three of the scenarios strongly focused on one of the key values (‘the Relaxed Sea’, ‘the Natural Sea’ and ‘the Rich Sea’), the other three scenarios were based on crossovers between two of the key values (‘the Playful Sea’ – see Figure 20, ‘the Mobile Sea’ and ‘the Sailing Sea’). The scenarios were designed to encourage the development of policy that anticipates future developments as well as reflecting present trends. It was not anticipated that any one of the scenarios would be adopted for future planning. They were designed to illustrate discrete options, provide insight into the implications certain decisions could have. Both facilitated strategic thinking.⁸⁶

FIGURE 22: PLAYFUL SEA SCENARIO FOR BELGIAN NORTH SEA



Source: Maes F et al, 2005

The results of the GAUFRE project were not intended to be formally adopted by the government. However, they did serve to illustrate how a strategic approach based on the development of different scenarios, each focussing on certain set of values, could be applied to marine spatial planning.

What the plan contains

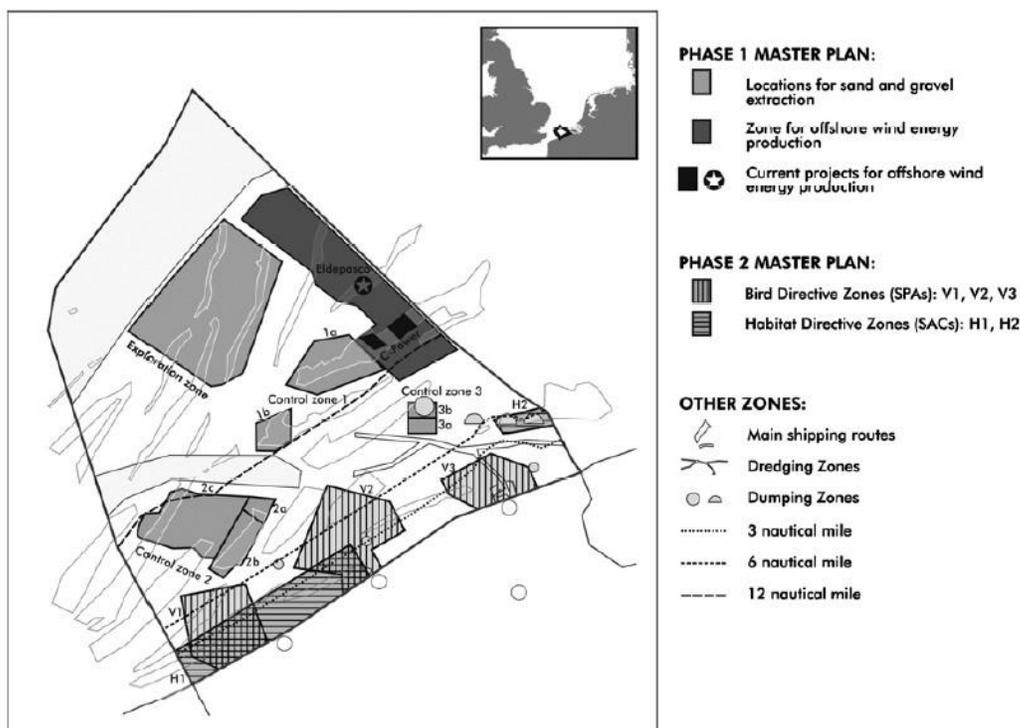
The Master Plan contains the following elements (see Figure 21):⁸⁷

- The spatial identification of *areas where sand and gravel extraction can take place* – this includes zones where a sequential rotation procedure is to be applied in order to spread the pressure of extraction and allow restoration of exploited areas. In some areas extraction is prohibited during fish spawning seasons.

- A zone for future offshore wind energy projects – it was envisaged that the windfarms might simultaneously host mussel farms thereby applying a multi-use approach to occupation of the marine area.
- Delimitation of marine protected areas – termed bird directive and habitat directive zones to relate to European Union directive requirements.

Future phases of plan development are expected to focus on protection of marine shipwrecks, the extension of terrestrial protected areas into the marine area, and the identification of new zones for mussel farms.

FIGURE 23: BELGIAN NORTH SEA MASTER PLAN MAP



Source: Douvere F et al, 2007

13 Barents Sea-Lofoten Islands Integrated Management Plan

The marine area covered by this management plan is almost 1,400,000 square kilometers. It is a relatively pristine polar area but expected to come under considerable pressure from petroleum exploitation, shipping and tourism. It includes nursery areas for fish stocks as well as food supplies for internationally important seabird colonies and a number of marine mammal populations. The area has a rich benthic fauna including coral reefs and sponge communities. It also supports one of the world's most important fishing areas.⁸⁸

The purpose of the integrated management plan was to provide a framework for the sustainable use of natural resources and goods derived from the Barents Sea–Lofoten area and at the same time maintain the structure, functioning and productivity of the area's ecosystems. The plan was completed in 2006 and is planned to be revised in 2010.

Legal framework for the plan

The plan was developed under the auspices of the White Paper on the future of oceans policy which was adopted by the Storting (Parliament) in 2002. In 2008 the Storting passed the *Oceans Resources Act* which consolidates legislation for the management of living marine resources. The Act also provides an explicit legal basis for the establishment of marine protected areas.

How the plan was prepared

Work on the plan commenced in 2002 and was overseen by an inter-Ministerial steering committee chaired by the Ministry for the Environment. For the first year the steering committee compiled status reports about the natural environment, use of the area and social characteristics of neighbouring communities.⁸⁹

During the next stage, impact assessments were undertaken for a range of activities and pressures including petroleum, fisheries, maritime transport, transboundary pollution, discharges from land-based activities, climate change and alien species.⁹⁰ Current and expected impacts were assessed up to 2020.

The final phase of the plan preparation process was to identify the total human impact on the system, management goals, gaps in knowledge, vulnerable areas and conflicts of interest. In addition, a set of operational environmental quality objectives were established based on high level management goals. These objectives will be monitored annually.⁹¹

Various interested parties were involved in the information gathering and assessment work. The work programmes were circulated to stakeholders for comment and the results of sectoral studies were discussed at consultation meetings. All documents were made available on the web. Written submissions were also received.⁹²

In 2004 the Steering Committee established an expert group tasked with compiling scientific information to form the basis of the plan. The group also identified environmental quality objectives. The following year a major conference on the management plan was held where all the scientific work was discussed in plenary and workshop sessions. A report from the conference was published.

A key focus of the project was identifying and mapping the location and approximate extent of particularly valuable and vulnerable areas. These were areas identified as being of great importance for biodiversity and for biological production in the entire area, and where adverse impacts might persist for many years. Criteria used to identify each area included:⁹³

- Whether it supports high production and high concentration of species
- Whether it includes a large proportion of endangered or vulnerable habitats
- Whether it is a key area for species which Norway has special responsibility for, or for endangered or vulnerable species
- Whether it supports internationally or nationally important populations of certain species all year round or at specific times of the year

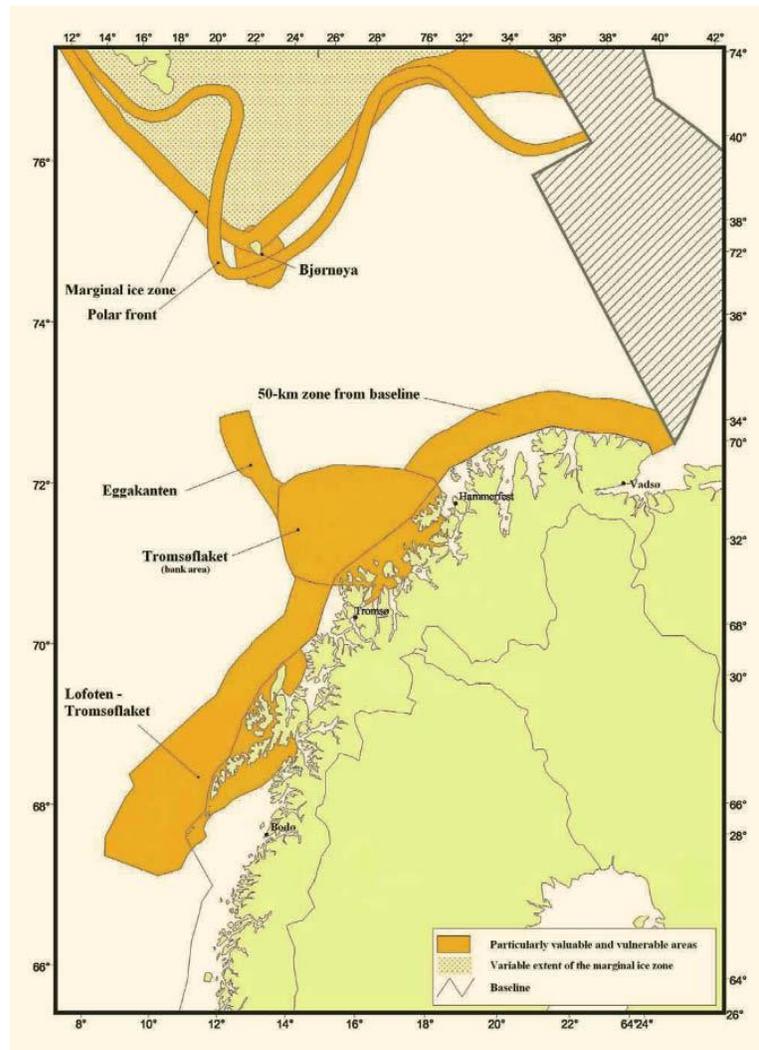
The vulnerability of these areas to a range of activities and pressures was assessed. The identification of a network of marine protected areas was undertaken through a separate process.

It did not prove possible to delimit the particularly valuable and vulnerable areas precisely, but the approximate extent of the most important of these areas was mapped (see Figure 22). The government also set targets for the management of biodiversity in these areas which were:⁹⁴

- Activities in particularly valuable and vulnerable areas will be conducted in such a way that the ecological functioning and biodiversity of such areas are not threatened.
- Damage to marine habitats that are considered to be threatened or vulnerable will be avoided.
- In marine habitats that are particularly important for the structure, functioning, productivity and dynamics of ecosystems, activities will be conducted in such a way that all ecological functions are maintained.

Although when the plan was adopted by the Storting, there was some controversy over the restrictions on petroleum activities, the actual process of preparing the plan remained relatively uncontroversial.⁹⁵

FIGURE 24: PARTICULARLY VALUABLE AND VULNERABLE AREAS



Source: The Royal Norwegian Ministry of the Environment, 2006

What the plan contains

For petroleum, spatial areas were identified where (see Figure 23):

- No petroleum activity is permitted
- No new petroleum activity is permitted
- No drilling is permitted during specific months of the year

The government has also set up three new advisory groups which all report to the governmental steering group. These include:⁹⁶

- A *monitoring group* responsible for coordinating monitoring activities and reporting annually on the state of the ecosystem. Ecosystem indicators are to be established to track the physical state of the sea, the production of zooplankton and phytoplankton, and the components of the ecosystem that live on this production.
- A *risk group* responsible for monitoring and reporting on potential risks to the ecosystem
- An *expert forum* responsible for advice on revisions to the plan

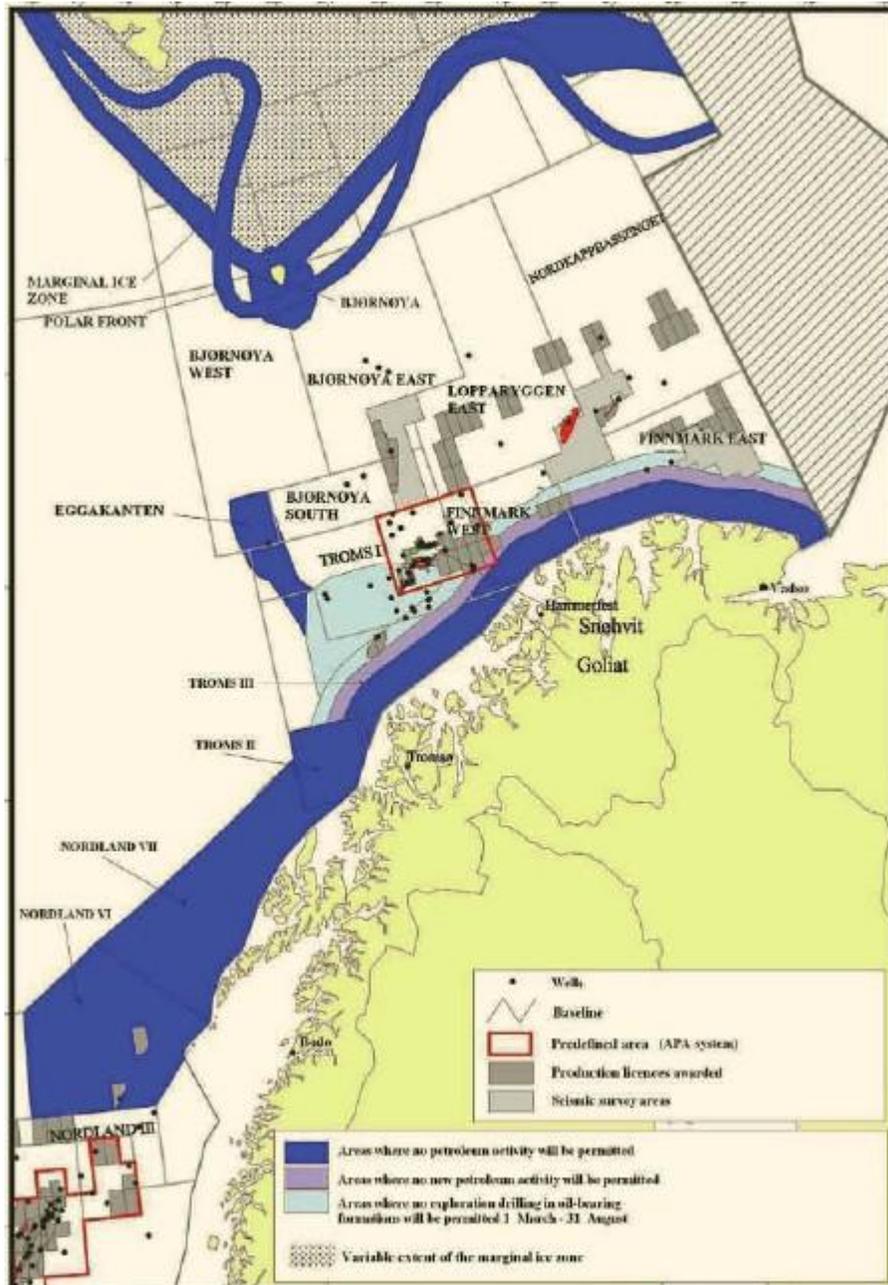
Provision for traditional use and management

Although the Saami Parliament has a consultation agreement with the Norwegian government, there were no explicit consultations with the Saami during the preparation of the Barents Sea plan, although they were involved in the regular consultation process. The Saami Parliament has now been invited to the meetings of a reference group which is considering implementation of the management plan. The new Oceans Resources Act requires regard to be had to Saami culture.⁹⁷

Lessons Learnt

A key challenge in developing the plan was to integrate work over sectoral barriers. This challenge was only successfully addressed by allowing non-specialists to have their say over how their sector should be managed.⁹⁸

FIGURE 25: BARENTS SEA-LOFOTEN ISLANDS ZONING MAP



Source: The Royal Norwegian Ministry of the Environment, 2006

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Appendix 1: Relevant sections of the Hauraki Gulf Marine Park Act 2008

3. Purpose

The purpose of this Act is to—

- (a) integrate the management of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments:
- (b) establish the Hauraki Gulf Marine Park:
- (c) establish objectives for the management of the Hauraki Gulf, its islands, and catchments:
- (d) recognise the historic, traditional, cultural, and spiritual relationship of the tangata whenua with the Hauraki Gulf and its islands:
- (e) establish the Hauraki Gulf Forum.

7. Recognition of national significance of Hauraki Gulf

- (1) The interrelationship between the Hauraki Gulf, its islands, and catchments and the ability of that interrelationship to sustain the life-supporting capacity of the environment of the Hauraki Gulf and its islands are matters of national significance.
- (2) The life-supporting capacity of the environment of the Gulf and its islands includes the capacity—
 - (a) to provide for—
 - (i) the historic, traditional, cultural, and spiritual relationship of the tangata whenua of the Gulf with the Gulf and its islands; and
 - (ii) the social, economic, recreational, and cultural well-being of people and communities:
 - (b) to use the resources of the Gulf by the people and communities of the Gulf and New Zealand for economic activities and recreation:
 - (c) to maintain the soil, air, water, and ecosystems of the Gulf.

8. Management of Hauraki Gulf

To recognise the national significance of the Hauraki Gulf, its islands, and catchments, the objectives of the management of the Hauraki Gulf, its islands, and catchments are—

- (a) the protection and, where appropriate, the enhancement of the life-supporting capacity of the environment of the Hauraki Gulf, its islands, and catchments:
- (b) the protection and, where appropriate, the enhancement of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments:

- (c) the protection and, where appropriate, the enhancement of those natural, historic, and physical resources (including kaimoana) of the Hauraki Gulf, its islands, and catchments with which tangata whenua have an historic, traditional, cultural, and spiritual relationship:
- (d) the protection of the cultural and historic associations of people and communities in and around the Hauraki Gulf with its natural, historic, and physical resources:
- (e) the maintenance and, where appropriate, the enhancement of the contribution of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments to the social and economic well-being of the people and communities of the Hauraki Gulf and New Zealand:
- (f) the maintenance and, where appropriate, the enhancement of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments, which contribute to the recreation and enjoyment of the Hauraki Gulf for the people and communities of the Hauraki Gulf and New Zealand.

9. Relationship of Act with Resource Management Act 1991

- (1) For the purposes of this section and section 10, the terms district plan, plan, proposed plan, regional plan, regional policy statement, resource consent, and New Zealand coastal policy statement have the same meaning as in the Resource Management Act 1991, and regional council and territorial authority have the same meaning as in the Local Government Act 2002.
- (2) A regional council must ensure that any part of a regional policy statement or a regional plan that applies to the Hauraki Gulf, its islands, and catchments, does not conflict with sections 7 and 8 of this Act.
- (3) A territorial authority must ensure that any part of a district plan that applies to the Hauraki Gulf, its islands, and catchments, does not conflict with sections 7 and 8 of this Act.
- (4) A consent authority must, when considering an application for a resource consent for the Hauraki Gulf, its islands, and catchments, have regard to sections 7 and 8 of this Act in addition to the matters contained in the Resource Management Act 1991.
- (5) The provisions of section 55 of the Resource Management Act 1991 apply as though sections 7 and 8 of this Act were a national policy statement and a regional council or a territorial authority must take action in accordance with that section and notify a change to a regional policy statement, plan, or proposed plan within 5 years of the date of commencement of this Act.

10. Creation of New Zealand coastal policy statement by this Act

- (1) For the coastal environment of the Hauraki Gulf, sections 7 and 8 of this Act must be treated as a New Zealand coastal policy statement issued under the Resource Management Act 1991.
- (2) For the coastal environment of the Hauraki Gulf, if there is a conflict between sections 7 and 8 of this Act and the provisions of any New Zealand coastal policy statement issued under the Resource Management Act 1991, the New Zealand coastal policy statement prevails.
- (3) The provisions of section 55 of the Resource Management Act 1991 apply to the New Zealand coastal policy statement created by this section and a regional council or a territorial authority

must take action in accordance with that section and notify a change to a regional policy statement, plan, or proposed plan within 5 years of the date of commencement of this Act.

32 Purposes of Hauraki Gulf Marine Park

The purposes of the Hauraki Gulf Marine Park are —

- (a) to recognise and protect in perpetuity the international and national significance of the land and the natural and historic resources within the Park:
- (b) to protect in perpetuity and for the benefit, use, and enjoyment of the people and communities of the Gulf and New Zealand, the natural and historic resources of the Park including scenery, ecological systems, or natural features that are so beautiful, unique, or scientifically important to be of national significance, for their intrinsic worth:
- (c) to recognise and have particular regard to the historic, traditional, cultural, and spiritual relationship of tangata whenua with the Hauraki Gulf, its islands and coastal areas, and the natural and historic resources of the Park:
- (d) to sustain the life-supporting capacity of the soil, air, water, and ecosystems of the Gulf in the Park.

References

Clelland D, 2010, *New planning framework project: Defining the preferred approach to spatial planning for Auckland*, unpublished paper

Cliquet A D, D Bogaert, D De Waen and F Maes, 2007, 'The designation of marine protected areas in Belgium: From government to governance?', *Proceedings MARE Conferentie People and the Sea IV, Who owns the coast?*, Amsterdam, 5-7 Juli 2007

Commonwealth of Australia, 1998, *Australia's ocean policy*, Environment Australia, Canberra

Day J, L Fernandes, A Lewis and J Innes, 2003, RAP – an ecosystem level approach to biodiversity protection planning, ITMEMS, March 2003, Manila, Philippines, available at http://www.gbrmpa.gov.au/__data/assets/pdf_file/0005/8249/ITMEMS_paper_23_Mar03_Comp_If-1.pdf

Department of Conservation (Auckland Conservancy), 2004, *Aotea (Great Barrier) marine reserve application: An application by the Director-General of Conservation*, Department of Conservation, Auckland

Department of Conservation and Ministry of Fisheries, 2006, *Marine protected areas policy statement and implementation plan*, Department of Conservation and Ministry of Fisheries, Wellington.

Douvere F, F Maes, A Vanhulle and J Schrijvers, 2007, 'The role of marine spatial planning in sea use management: The Belgian case', *Marine Policy*, 31, 182-191

Douvere F and C N Ehler, 2009a, 'New perspectives on sea use management; Initial findings from European experience with marine spatial planning', *Journal of Environmental Management* 90, 77-88

Douvere F and C N Ehler, 2009b, 'Ecosystem-based marine spatial management: an evolving paradigm for the management of coastal and marine places', *Ocean Yearbook*, 23, 1-26

Ehler C and F Douvere, 2009, *Marine spatial planning – A step-by-step approach toward ecosystem-based management*, Intergovernmental Oceanographic Commission and Man and the Biosphere Programme, No. 53, IOCAM Dossier No. 6, Paris, UNESCO

Executive Office for Energy and Environmental Affairs, 2008, *Ocean planning Habitat Work Group report*, The Commonwealth of Massachusetts, Boston

Executive Office for Energy and Environmental Affairs, 2009a, *Draft Massachusetts Ocean Management Plan Volume 1*, The Commonwealth of Massachusetts, Boston

Executive Office for Energy and Environmental Affairs, 2009b, *Massachusetts Ocean Management Plan Volume 1*, The Commonwealth of Massachusetts, Boston

Fisheries and Oceans Canada, 2007, *Eastern Scotian Shelf integrated ocean management plan: Summary report*, Fisheries and Oceans Canada, Dartmouth

Foley M M, B J Halpern, F Micheli, M H Armsby, M R Caldwell, C M Crain, E Prahler, N Rohr, D Sivas, M W Beck, M H Carr, L B Crowder, J E Duffy, S D Hacker, K L McLeod, S R Palumbi, C H Peterson, H M Regan, M H Ruckelshaus, P A Sandifer and R S Steneck, 2010, 'Guiding ecological principles for marine spatial planning', *Marine Policy*, doi:10.1016/j.marpol.2010.02.001

Framlingham Aboriginal Trust and Winda Mara Aboriginal Corporation, 2004, *Kooyang sea country plan*, Framlingham Aboriginal Trust and Winda Mara Aboriginal Corporation, Victoria

Great Barrier Reef Marine Park Authority, 2002, *Biophysical operational principles as recommended by the Scientific Steering Committee*, Technical Information Sheet Number 6, Great Barrier Reef Marine Park Authority, Townsville

Great Barrier Reef Marine Park Authority, 2005, *Report on the Great Barrier Reef Marine Park Zoning Plan 2003*, Great Barrier Reef Marine Park Authority, Townsville

Guénette S and J Alder, 2007, 'Lessons from marine protected areas and integrated ocean management initiatives in Canada', *Coastal Management*, 35, 51-78

Håkon Hoel A, C H von Quillfeldt and E Olsen, 2009, 'Norway and integrated oceans management – the case of the Barents Sea', in A Håkon Hoel (ed) *Best practices in ecosystem-based oceans management in the Arctic*, Report Series No. 129, Norwegian Polar Institute, Tromsø

Hauraki Gulf Forum, 2004, *The Hauraki Gulf State of Environment Report*, Hauraki Gulf Forum, Auckland

Hauraki Gulf Forum, 2008, *Tikapa Moana - Hauraki Gulf State of Environment Report*, Hauraki Gulf Forum, Auckland

Hauraki Gulf Forum, 2009, *Governing the Gulf: Giving effect to the Hauraki Gulf Marine Park Act through policies and plans*, Hauraki Gulf Forum, Auckland

Hauraki Gulf Forum, 2010, *Fishing the Gulf: Implementing the Hauraki Gulf Marine Park Act through fisheries management*, Hauraki Gulf Forum, Auckland

Heatley P, 2010, *Aquaculture reform paper 2: Further proposals and report back*, paper to Cabinet Economic Growth and Infrastructure Committee, 26 June

Interagency Ocean Policy Task Force, 2009, *Interim framework for effective coastal and marine spatial planning*, The White House Council on Environmental Quality, Washington

LECG, 2009, *Review of regulatory regime for aquaculture: Background report*, LECG, Wellington

Lewis A, S Slegers, D Lowe, L Muller, L Fernandes and J Day, 2003, 'Use of spatial analysis and GIS techniques to re-zone the Great Barrier Reef Marine Park', *Coastal GIS Workshop, July 7-8 2003*,

University of Wollongong, Australia, available at
http://www.gbrmpa.gov.au/__data/assets/pdf_file/0004/8248/lewis_et_al_final03.pdf

Maes F, Cliquet A, Degraer S, Derous S, De Wachter B, Douvere F, Leroy D, Schrijvers J, Van Lancker V, Verfaillie E and Volckaert A, 2005, *A Flood of Space: Towards a Spatial Structure Plan for Management of the North Sea*, Belgian Science Policy, Belgium.

Ministry for the Environment, 2010, *Building competitive cities: Reform of the urban and infrastructure planning system: A discussion document*, Ministry for the Environment, Wellington

Ministry of Fisheries, 2009, *Fisheries 2030*, Ministry of Fisheries, Wellington

Ministry of Fisheries and Department of Conservation, 2008, *Marine protected areas: Classification, protection standard and implementation guidelines*, Ministry of Fisheries and Department of Conservation, Wellington

National Oceanic and Atmospheric Administration, 1996, *Florida Keys National Marine Sanctuary final management plan/environmental impact statement Volume II*, National Oceanic and Atmospheric Administration, Marathon, Florida

National Oceanic and Atmospheric Administration, 2007, *Florida Keys National Marine Sanctuary Revised Management Plan*, National Oceanic and Atmospheric Administration, Marathon, Florida, available at http://floridakeys.noaa.gov/pdfs/2007_man_plan.pdf

National Oceans Office, 2004, *South-east regional marine plan: Implementing Australia's oceans policy in the south-east marine region*, Australian Government, Hobart

Oceans Policy Science Advisory Group, 2009, *A marine nation: National framework for marine research and innovation*, Australian Government, Canberra

Olsen E, H Gjørseter, I Røttingen, A Dommasnes, P Fossum and P Sandberg, 2007, 'The Norwegian ecosystem-based management plan for the Barents Sea', *ICES Journal of Marine Science*, 64 (4), 599-602

Palacio M C, 2008, *The role of biodiversity databases in coastal conservation and resource management*, Masters thesis submitted to Auckland University of Technology

Payne K, 2010, 'Report of the ocean special areas management plan stakeholder process', Technical Report number 22, in Rhode Island Coastal Resources Management Council, *Draft ocean special area management plan*, Wakefield, Rhode Island

Peart R, 2005, *Looking out to sea: New Zealand as a model for oceans governance*, Environmental Defence Society, Auckland

Rhode Island Coastal Resources Management Council, 2010, *Draft ocean special area management plan*, Rhode Island Coastal Resources Management Council, Wakefield, Rhode Island

Rutherford R J, G J Herbert and S S Coffen-Smout, 2005, 'Integrated ocean management and the collaborative planning process: The Eastern Scotian Shelf integrated management (ESSIM) initiative', *Marine Policy*, 29(1), 75-83

Taussick J, 2007, 'The opportunities of spatial planning for integrated coastal management', *Marine Policy*, 31, 611-618

The Royal Norwegian Ministry of the Environment, 2006, *Integrated management of the marine environment of the Barents Sea and the sea areas off the Lofoten Islands*, Report No. 8 to the Storting

Endnotes

¹ Hauraki Gulf Forum, 2009, 61 and 77

² Taussick J, 2007, 612

³ Interagency Ocean Policy Task Force, 2009, 1

⁴ Foley M M et al, 2010, 2

⁵ Douvere F and C N Ehler, 2009b, 11-15

⁶ http://ec.europa.eu/maritimeaffairs/spatial_planning_en.html

⁷ Interagency Ocean Policy Task Force, 2009, 1

⁸ UK-MSP Working Group, 2005, *Added value of marine spatial planning*, County Agencies, Interagency MSP Working Group, United Kingdom, cited in Douvere F and C N Ehler, 2009a, 78

⁹ <http://coastalfirstnations.ca/files/PDF/seaofchange.pdf>

¹⁰ Rhode Island Coastal Resource Management Council, 2010, 11-6

¹¹ Hauraki Gulf Forum, 2004, 27-29

¹² Department of Conservation (Auckland Conservancy), 2004, 16

¹³ Palacio M C, 2008, 85 and 116

¹⁴ Hauraki Gulf Forum, 2008, 52-53

¹⁵ Hauraki Gulf Forum, 2004, 99-100

¹⁶ Hauraki Gulf Forum, 2004, 100

¹⁷ Hauraki Gulf Forum, 2008, 10

¹⁸ Hauraki Gulf Forum, 2008, 13-14

-
- ¹⁹ Hauraki Gulf Forum, 2004, 13
- ²⁰ Hauraki Gulf Forum, 2010, 11-13
- ²¹ http://www.poal.co.nz/news_media/publications/POAL_annual_review_2010.pdf
- ²² Hauraki Gulf Forum, 2008, 71
- ²³ LECG, 2009, 14
- ²⁴ Hauraki Gulf Forum, 2010, 23
- ²⁵ Heatley P, 2010, 11-14
- ²⁶ Clelland D, 2010, 30
- ²⁷ Ministry for the Environment, 2010, 23-24
- ²⁸ Ministry of Fisheries, 2009
- ²⁹ Department of Conservation and Ministry of Fisheries, 2006
- ³⁰ Ministry of Fisheries and Department of Conservation, 2008
- ³¹ Lewis A et al, 2003, 1-2
- ³² Great Barrier Reef Marine Park Authority, 2005, 4
- ³³ Great Barrier Reef Marine Park Authority, 2005, 11
- ³⁴ Day J et al, 2003, 3-4
- ³⁵ Day J et al, 2003, 6
- ³⁶ Lewis A et al, 2003
- ³⁷ Great Barrier Reef Marine Park Authority 2005, 57
- ³⁸ Day J et al, 2003, 4
- ³⁹ Day J et al, 2003
- ⁴⁰ National Oceanic and Atmospheric Administration, 2007, 5
- ⁴¹ National Oceanic and Atmospheric Administration, 2007, 2
- ⁴² National Oceanic and Atmospheric Administration, 1996, 134
- ⁴³ National Oceanic and Atmospheric Administration, 2007, 142
- ⁴⁴ Commonwealth of Australia, 1998, 13

-
- ⁴⁵ National Oceans Office, 2004, 6
- ⁴⁶ <http://www.alp.org.au/agenda/more---policies/a-healthy-environment/>
- ⁴⁷ <http://www.environment.gov.au/coasts/mbp/about/index.html>
- ⁴⁸ Oceans Policy Science Advisory Group, 2009
- ⁴⁹ National Oceans Office, 2004, 69
- ⁵⁰ Framlingham Aboriginal Trust and Winda Mara Aboriginal Corporation, 2004, 65
- ⁵¹ Peart R, 2005, Appendix A
- ⁵² Fisheries and Oceans Canada, 2007, 4
- ⁵³ Peart R, 2005, 167
- ⁵⁴ Fisheries and Oceans Canada, 2007, 8-9
- ⁵⁵ Rutherford R J et al, 2005, 82
- ⁵⁶ Guénette S and J Alder, 2007, 65
- ⁵⁷ Fisheries and Oceans Canada, 2007, 13
- ⁵⁸ Guénette S and J Alder, 2007, 66
- ⁵⁹ Peart R, 2005, 170
- ⁶⁰ Peart R, 2005, 170
- ⁶¹ Guénette S and J Alder, 2007
- ⁶² Executive Office for Energy and Environmental Affairs, 2009a, 2-1
- ⁶³ Executive Office for Energy and Environmental Affairs, 2009a, 2-6
- ⁶⁴ Executive Office for Energy and Environmental Affairs, 2009a, 1-7
- ⁶⁵ Executive Office for Energy and Environmental Affairs, 2009b, 3-13
- ⁶⁶ Executive Office for Energy and Environmental Affairs, 2009a, 1-7-1-8
- ⁶⁷ Executive Office for Energy and Environmental Affairs, 2008,4
- ⁶⁸ Executive Office for Energy and Environmental Affairs, 2008, 5
- ⁶⁹ Executive Office for Energy and Environmental Affairs, 2009a, 3-6 - 3-13
- ⁷⁰ Executive Office for Energy and Environmental Affairs, 2009a, 3-13-3-14

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- ⁷¹ Executive Office for Energy and Environmental Affairs, 2009a, 3-16-3-18
- ⁷² Rhode Island Coastal Resources Management Council, 2010, 11-3
- ⁷³ Payne K, 2010, 1787
- ⁷⁴ Rhode Island Coastal Resource Management Council, 2010, 1-14
- ⁷⁵ Rhode Island Coastal Resource Management Council, 2010, 1-14
- ⁷⁶ Rhode Island Coastal Resource Management Council, 2010, 11-6
- ⁷⁷ Douvere F et al, 2007, 183 & 185
- ⁷⁸ Douvere F et al, 2007, 187
- ⁷⁹ Douvere F et al, 2007, 186
- ⁸⁰ Cliquet A et al, 2007, 6
- ⁸¹ Cliquet A et al, 2007, 6
- ⁸² Cliquet A et al, 2007, 7
- ⁸³ Douvere F et al, 2007, 187
- ⁸⁴ Douvere F et al, 2007, 186
- ⁸⁵ Douvere F et al, 2007, 189
- ⁸⁶ Maes et al, 2005
- ⁸⁷ Douvere F et al, 2007, 186-187
- ⁸⁸ The Royal Norwegian Ministry of the Environment, 2006, 13
- ⁸⁹ The Royal Norwegian Ministry of the Environment, 2006, 15
- ⁹⁰ The Royal Norwegian Ministry of the Environment, 2006, 15
- ⁹¹ Olsen E et al, 2007, 600- 601
- ⁹² The Royal Norwegian Ministry of the Environment, 2006, 15
- ⁹³ The Royal Norwegian Ministry of the Environment, 2006, 27
- ⁹⁴ The Royal Norwegian Ministry of the Environment, 2006, 99
- ⁹⁵ Håkon Hoel A, 2009, 47
- ⁹⁶ Olsen E et al, 2007, 602

⁹⁷ Håkon Hoel A, 2009, 46

⁹⁸ Håkon Hoel A, 2009, 47