
SOUTH-EAST MARINE PROTECTION FORUM
ROOPU MANAAKI KI TE TOKA

Recommendations to the Minister of Conservation and the Minister of Fisheries

FEBRUARY 2018



**SOUTH-EAST
MARINE PROTECTION
FORUM**
ROOPU MANAAKI
KI TE TOKA

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South-East Marine Protection Forum: Recommendations to Ministers

ISBN 978-1-98-851450-5 (print)

ISBN 978-1-98-851451-2 (online)

Front cover: *Macrocystis*. Photo: Chris Hepburn

Back cover: Kelp. Photo: John Barkla

Citation:

South-East Marine Protection Forum. 2018. Recommendations to the Minister of Conservation and the Minister of Fisheries: Recommendations towards implementation of the Marine Protected Areas Policy on the South Island's south-east coast of New Zealand. Department of Conservation. Wellington. 314 p.

The document is available at <https://south-eastmarine.org.nz/recommendations>



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Recommendations to the Minister of Conservation and the Minister of Fisheries

FEBRUARY 2018

Recommendations towards implementation of
the Marine Protected Areas Policy
on the South Island's south-east coast of New Zealand





**“ Ehara taku toa i te toa takitahi, engari,
he toa takitini.**

My success should not be bestowed
onto me alone, as it was not individual
success, but success of a collective.

”

Tui tui tui tuia
tuia i ruka, tuia i raro
tuia i roto, tuia i waho
tuia kā here takata
Tihei mauriora

Toitū te moana, toitū te whenua, toitū te marae
kia ora ai te iwi me te hapori

E rau raketira, kā Mīnita o te Karauna
o te Manatū Ahu Matua me Te Papa Atawhai
Tēnā kōrua, karaka mai, karaka atu
E rere ana kā mihi

Ko tēnei te ripota nei nā
e whāriki nei ki mua i a koutou
ki a kōrua e kā Minita
mā kōrua e āta whiriwhiri

He tino kaupapa tēnei mō te roopū
kia tika te tiakina o te moana
me kā tini taoka a Takaroa
ki te tai toka, ki uta, ki tai

Arā kā manako o te iwi o Kāi Tahu
me kā hapori
e mahi kātahi ana, e peto koi ana
kia tika te ara whakamua

Ka tika kia huri ki a rāua kā mema kua memeha atu
Ko Pauline Reid rāua ko Nelson Cross
Haere kōrua, haere, moe mai, oki, oki mai

Ka huri ki te kaupapa anō
kia oti ai ā tātou mahi
Kua raraka te korowai
kia atawhai
te moana me kā uri a Takaroa.

Unite, Unite,
unite above, unite below
unite within, unite without
unite the people
it is life.

Protect the sea, protect the whenua, protect our ceremonial courtyards
and the people will prosper.

To you of chiefly status, the Ministers;
Ministry for Primary Industries and Department of Conservation
Salutations, we exchange greetings
Many and diverse are our callings.

This is the report
that the Forum lay before you
to you the two Ministers
for your careful and considered action.

The Forum were committed
to the appropriate protection
of the treasures of Takaroa
in the south-east region, both inshore and offshore.

The aspirations of Kāi Tahu
and the community of stakeholders
worked collaboratively and energetically
in good faith.

Our thoughts for the two Forum members
Pauline Reid and Nelson Cross
who have passed, farewell, rest.

Returning to the kaupapa
this represents the end of our work
the cloak has been weaved
to protect
the moana and fishery habitat of Takaroa.

FOREWORD

The South-East Marine Protection Forum – Te Roopu Manaaki ki te Toka (the Forum) was established in April 2014, marking the beginning of a nationally significant and ambitious consultative process to deliver to Government recommendations for a network of Marine Protected Areas (MPAs) on the south-east coast of Aotearoa me Te Waiponamu – the South Island of New Zealand.

This government-appointed Forum is made up of 16 people who between them represent manawhenua, commercial and recreational fishers, the environmental, science and tourism sectors, and the wider community, as well as an independent chair. Kāi Tahu, in recognition of their Treaty partner status, selected their representatives whom the Minister then appointed.

The Forum's work is part of New Zealand's international commitment to protecting marine biodiversity in order to help safeguard the long-term viability of habitats and ecosystems. The south-east coast of the South Island from Timaru to Waipapa Point is characterised by the mixing of subantarctic waters with warmer waters, deep offshore canyons that are relatively close to the shoreline, inshore reefs and estuaries; and its abundant biodiversity includes giant kelp forests and deep-water bryozoan thickets, which are rare globally.

From the outset, the Forum members were aware of the magnitude of the task in front of them and the challenges that a multi-sector group would have to face when striving to determine community aspirations over such a long stretch of coast in order to reach consensus in decision making. What they couldn't know was that this process would consume their lives for three and a half years.

As Chair, I observed each and every member demonstrating a tireless commitment to stakeholder engagement during that time, both prior to and during the public consultation process. Testimony to their dedication and the far-reaching nature of their engagement was the volume of public submissions received – an overwhelming 2803, which equated to over 10,000 pages of feedback.

The public's response reinforced the importance of the coast and its marine environment to the communities that live, work and relax here. The values expressed helped inform the Forum's deliberations: from kaitiakitaka (guardianship) and customary use to the transfer of mātauraka (traditional knowledge) from generation to generation; from lifestyles and livelihoods to the importance of fishing to individuals and industry; and from regional pride in marine mammals and seabirds to the singular appreciation of the dramatic coast.

When the Forum began the process of working towards a network design, it did so in the knowledge that there was no pre-determined outcome. Forum members have worked collaboratively and in a manner that has been respectful to all parties, and have always been mindful of giving effect to the principles of the Treaty of Waitangi and the Ngāi Tahu Deed of Settlement.

In striving for consensus, the Treaty partner and all stakeholder groups made concessions, to the point where all may feel compromised with the final recommendations from their own perspective. However, that takes nothing away from the time, energy and service that all Forum members have brought to the table, and the pride they should feel collectively for the process that was undertaken with the time and resources available – not to mention the resource that these recommendations provide for the Government tasked with their implementation.

As Chair of the Forum, I have been privileged to spend time with this hard-working, good-humoured and dedicated group of people. Their commitment and passion for the marine environment and the people it supports was evident in their tenacity, depth of knowledge and ongoing determination in the face of numerous setbacks and challenges to see this process through. The outcome is a report that we know will be relied upon for the next stage of implementing a network of MPAs for the south-east coast of the South Island of New Zealand.

A handwritten signature in blue ink that reads "Maree Baker-Galloway". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Maree Baker-Galloway

South-East Marine Protection Forum Chair

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HOW TO READ THIS REPORT

This report presents the South-East Marine Protection Forum’s recommendations to the Ministers of Conservation and Fisheries. The Executive Summary is a succinct precis of the recommendations contained within this report.

The Forum’s understanding of Kāi Tahu rights and interests when recommending sites for protection is initially provided, along with a brief introduction to the Forum region and process.

The Forum’s recommendations form the main body of the report. Each recommendation is prefaced by an explanation, and described in terms of its contributions to the Marine Protected Areas Policy and Implementation Plan (the MPA Policy) objectives, and its effects on existing users. In addition, Network 1 includes a recommendation for a site that sits outside the network.

Individual sites are then presented with a site-by-site rationale for their inclusion in a network, how they meet the protection standard and other matters relevant to the MPA Policy, such as the assessment of effects on existing users. More detailed site information has been provided in Appendix 1.

Following the site descriptions, the Forum has made recommendations in relation to the future management of the potential MPAs and general recommendations in regard to other significant factors.

Universal issues have also been noted to record some of the obstacles that hindered reaching consensus. These may assist future processes or reforms.

The report concludes with a description of broader issues, which were out of scope for the Forum but which some Forum members would like to bring to the attention of the Ministers.

A glossary is provided, which includes both Te Reo and English terms, while the appendices are a source of more in-depth information including:

- Site-by-site habitat and fisheries data
- Marine Protected Area (MPA) planning information
- Forum context
- Submission information.

Points of clarification

TE REO

In the Kāi Tahu dialect, the ‘k’ and ‘ng’ in Māori words are used interchangeably. However, in this report, there is a preference for the use of ‘k’ in all instances except where the words are in statute or are legislative terms (e.g. Te Rūnanga o Ngāi Tahu).

MARINE PROTECTED AREAS (MPAS)

Type 1 MPAs

Type 1 MPAs are Marine Reserves, which are typically established under the Marine Reserves Act 1971 to give the highest possible level of protection for the purpose of preserving marine life for scientific study. They are generally no-take areas.

In this report, Type 1 MPAs are always referred to as Marine Reserves. This convention differs from that followed in the Consultation Document, where Marine Reserves were regularly described as Type 1 MPAs.

Type 2 MPAs

Type 2 MPAs are areas that incorporate various management tools that together meet the protection standard. Management tools can be established under various Acts, but most notably the Fisheries Act 1996. Type 2 MPAs are not no-take areas as they generally allow most recreational fishing to occur, as well as some commercial fishing depending on the fishing method.¹ A mandatory / bottom line requirement to qualify as a Type 2 MPA is the prohibition of mobile bottom-impacting fishing methods.

Other marine protection tools

The MPA Policy anticipates a third category of tools that do not meet the protection standard but may contribute to protecting a particular matter that is relevant to the MPA Policy. While these can be relevant, they are not classified as MPAs under the policy and are not considered in any network-wide analysis.

Legend for habitat maps

The legend for all habitat maps can be found on the inside back cover.

¹ Ministry of Fisheries & Department of Conservation 2008: Marine Protected Areas Classification, Protection Standard and Implementation Guidelines. p. 10–13.

EXECUTIVE SUMMARY

The South-East Marine Protection Forum – Te Roopu Manaaki ki te Toka (the Forum) was appointed by the then Minister of Conservation and the then Minister for Primary Industries in 2014. The Forum was tasked with providing recommendations on marine protection for the marine coastal area (mean high water springs out to 12 nautical miles (NM)) from Timaru in South Canterbury to Waipapa Point in Southland (the Forum region). The Forum represents manawhenua and a diverse range of community interests, including those of commercial and recreational fishers, local government and communities, environmental, science, and tourism.

Marine Protected Area (MPA) planning – background

The Forum was required by its Terms of Reference² to carry out its task in accordance with the Marine Protected Areas Policy and Implementation Plan³ (the MPA Policy), and the Marine Protected Areas Classification, Protection Standard and Implementation Guidelines⁴ (the MPA Guidelines). The objective of the MPA Policy is to:

Protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of New Zealand's marine habitats and ecosystems.

The MPA network is part of New Zealand's effort to meet biodiversity protection commitments under the United Nations Convention on Biological Diversity.⁵ New Zealand has committed to include at least 10% of its coastal and marine environment in a network of representative MPAs by 2020.⁶

To ensure that marine protection is representative of a range of habitat types, the MPA Guidelines include a hierarchical classification system⁷ that can be used to identify habitats that should be included in a network. Habitats are classified using combinations of their physical attributes (biogeographic region⁸, depth, exposure and substrate types), which are intended as proxies for the range of ecosystems that occur around the coast of New Zealand. In addition, 'outstanding, rare, distinctive or internationally or nationally important marine habitats and ecosystems'⁹ are to be included in the MPA network.

The information provided to the Forum identified 22 broad-scale coastal habitats, 12 estuarine habitats and three biogenic habitats within the Forum region, some of which are

² See Appendix 3.3: Forum's Terms of Reference

³ Department of Conservation; Ministry of Fisheries 2005: Marine Protected Areas: Policy and Implementation Plan. Department of Conservation and Ministry of Fisheries. 25 p.

⁴ Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. 54 p.

⁵ New Zealand ratified the Convention in 1993.

⁶ The original target in The New Zealand Biodiversity Strategy 2000–2020 was 2010 (Objective 3.6 action (b), p. 67); however, this has since been updated to 2020 as a result of the Aichi Target 11.

⁷ See Appendix 5: Habitat Classification for further details on the habitat classification system.

⁸ There are 14 biogeographic regions around New Zealand. The Forum region is a sub-region of the Southern South Island biogeographic region. See Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. p. 8.

⁹ Department of Conservation; Ministry of Fisheries 2005: Marine Protected Areas: Policy and Implementation Plan. p. 10.

distinctive or outstanding. The MPA Policy requires that each habitat type is protected in a Marine Reserve and replicated in at least one other MPA.

To contribute towards the network and count as an MPA, the protection of a site must meet the protection standard under the MPA Policy and must be viable, i.e. 'enable the maintenance and recovery of the site's biological diversity at the habitat and ecosystem level to a healthy functioning state.'¹⁰

The above requirements of representativeness, replication, meeting the protection standard and viability were key requirements during the Forum's process of identifying and designing recommended sites, and making overall network recommendations.

Development of recommendations

In making its recommendations, the Forum has been particularly mindful of the special status of Kāi Tahu as manawhenua and has taken account of Kāi Tahu rights and interests, as reflected in the recommendations for generational review and co-management to ensure continued engagement. The Forum has also consulted with the local community and others with an interest in the Forum region. These engagements have informed the Forum's recommendations.

The majority of submissions supported the sites that were consulted on, although some suggested changes to boundaries, proposed additional sites or were in opposition to any form of spatial marine protection. Further details about the number of submitters and submission types have been included in Appendix 4 and Section 1.4 of this report.

Many submitters advocated for more extensive marine protection, particularly those from the environmental, science and tourism sectors. Submitters from the commercial and recreational fishing sectors tended to support a limited network of MPAs, and emphasised the importance of the fishing industry and lifestyle. These submitters also often advocated for better fisheries management to address any sustainability issues rather than the creation of MPAs.

Customary submitters expressed a range of views. The main Kāi Tahu submissions, made by Te Rūnanga o Ngāi Tahu and various rūnaka, assessed each proposed site on its own merits and identified support or opposition according to the potential impact on customary commercial and non-commercial fishing rights and interests.

The biodiversity of the Forum region and the features that distinguish the environment of the south-east coast of the South Island from the rest of coastal New Zealand are reflected in the Forum's recommendations. In selecting sites to recommend, the Forum has considered the protection needs of the Forum region and, as set out in the MPA Policy and MPA Guidelines, has taken into account potential adverse impacts on Treaty settlement obligations and existing users, particularly commercial and recreational fishers, as well as the potential socioeconomic benefits of protecting particular sites, such as enhancing tourism.

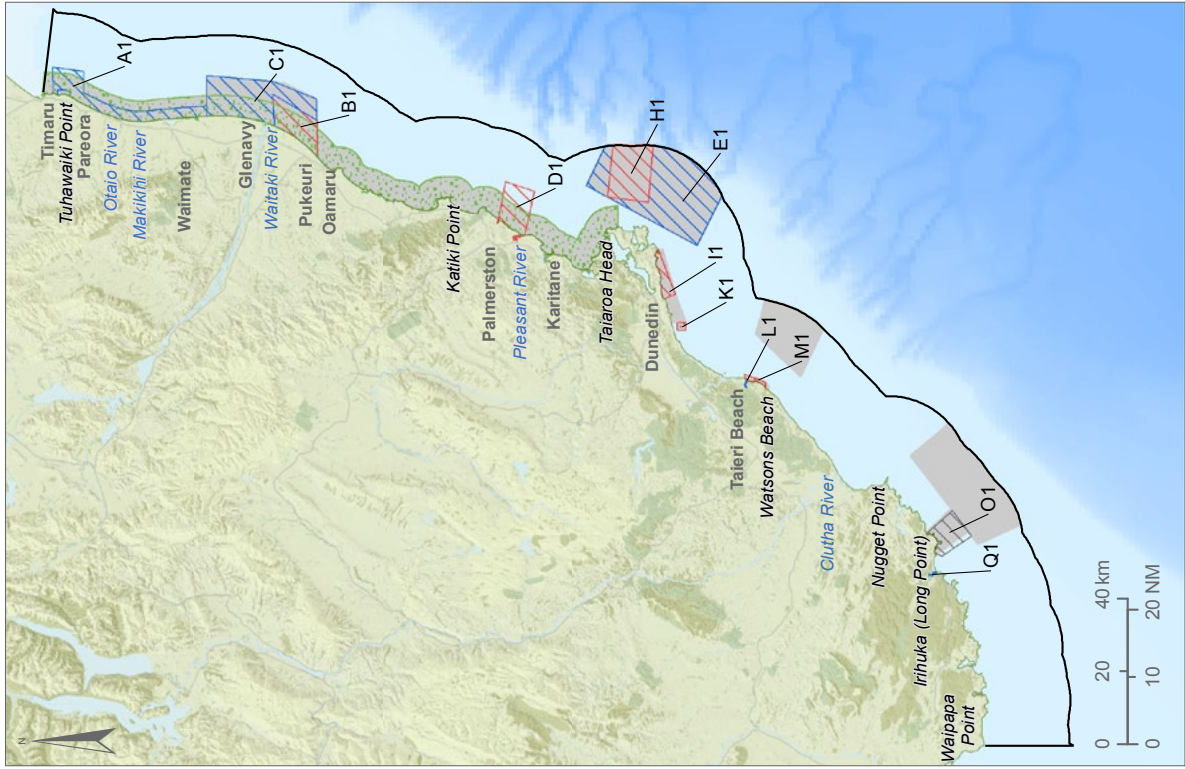
The Forum has been unable to reach consensus on a single network of MPAs. Instead, this recommendations report details two proposed networks. The support within the Forum for each of the networks is broadly reflective of the community views expressed in submissions and is divided along similar sectoral lines.

¹⁰ Department of Conservation; Ministry of Fisheries 2005: Marine Protected Areas: Policy and Implementation Plan. p. 17. See also Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines and Appendix 2.1.

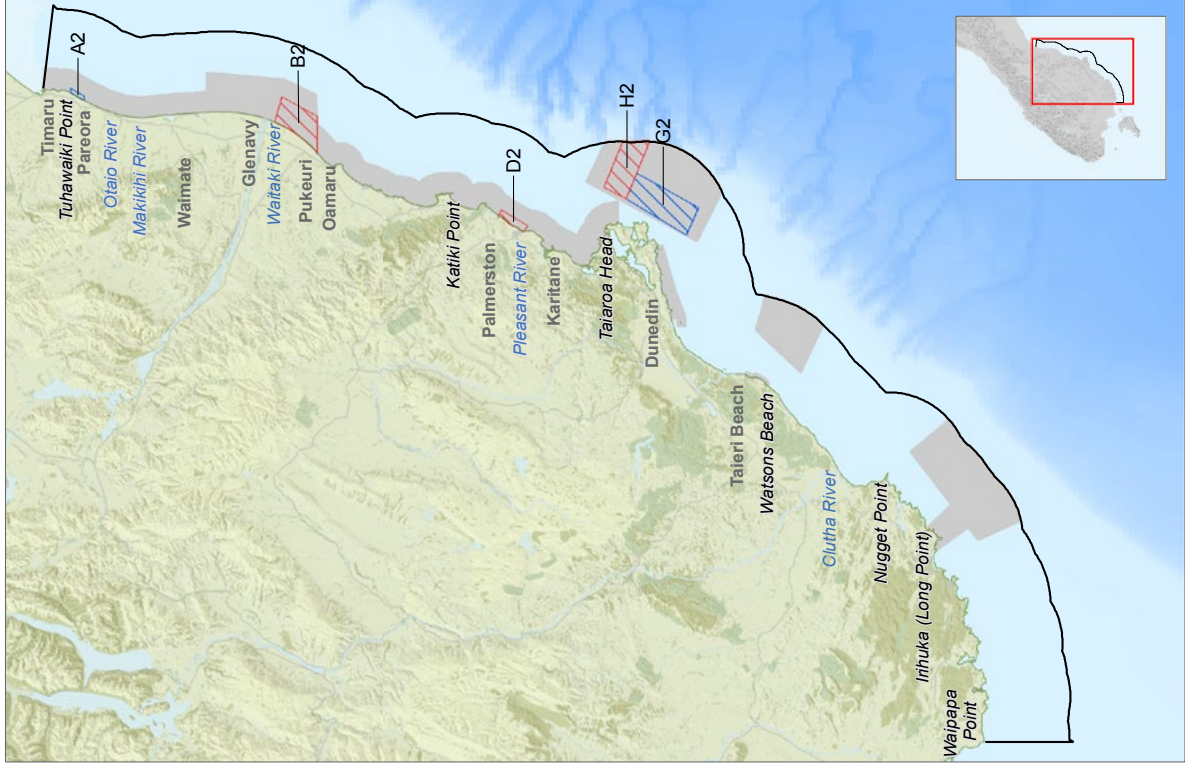
Figure ES-1. Network Overview

The sites that have been recommended for inclusion in Network 1 and Network 2. The areas that were originally consulted on are also shown in grey.







Network 1



Network 2



Management areas

-  Marine Reserve
-  Type 2 MPA
-  Unconfirmed site
-  Consultation area
-  Site T1 - Kelp forest
-  Forum region

Network recommendations

The two networks are identified as Network 1 and Network 2 (see Figure ES-1), and differ in extent according to their impacts on existing users and the sectors that support them.

Network 1 is supported by the environment, tourism, community and science sectors, as well as one of the two recreational fishing representatives. The proposed MPAs in Network 1 are not opposed by Kāi Tahu, with the exception of Site O1 - Irahuka (Long Point). Consequently Site O1 - Irihuka (Long Point) is not included in the subsequent Network 1 analysis.

Network 2 is supported by the commercial fishing representatives and the remaining recreational fishing representative. None of the proposed MPAs in Network 2 are opposed by Kāi Tahu.

Several sites are common between the two networks but the proposed boundaries and level of protection differ.

Table ES-1: Summary of the key attributes of each network

Network	% of Forum region	Size (km ²)	No. of Marine Reserves	No. of Type 2 MPAs	No. of habitats (of 37) ¹¹	Estimated export value of potentially displaced fishery (\$)
Network 1	14.2	1,267	6*	5	27	3.6 million
Network 2	4.1	366	3	2	12	1.2 million

* This number does not include Site O1 - Irihuka (Long Point).

NETWORK 1

The proponents of Network 1 had a vision for developing a network of MPAs that will play a part in restoring and sustaining marine ecosystems within the Forum region for future generations. Their aim is to protect many of the Forum region's iconic marine habitats, species and ecosystems, while emphasising those that are rare, distinctive and nationally or internationally important.

The Network 1 proponents believe that they are responding to the community's call for better protection of the local marine environment in their network design. They also identify potential scientific, educational and tourism benefits from their network.

NETWORK 2

The proponents of Network 2 designed their network to protect nationally significant biogenic habitats within Marine Reserves in combination with Type 2 MPAs that protect important recruitment areas and nursery habitats.

The Network 2 proponents consider that fishing methods with lower environmental impacts can continue to be used while still meeting broader biodiversity objectives and so have considered existing fishing restrictions in evaluating the level of protection that they are

¹¹ Includes coastal and estuarine broad-scale habitats, and biogenic habitats.

recommending. They consider that the range of biodiversity in the Forum region is reflected in their proposed network, especially if the protection provided by these existing restrictions is taken into account. These restrictions and the recommended MPAs have the potential to contribute to rebuilding biogenic habitats and trophic linkages, and could be relevant when measuring progress towards the New Zealand Biodiversity Strategy target¹² (as distinct from the MPA Policy) if assessed as making an effective contribution.

Management recommendations

The Forum makes the following recommendations regarding the management and monitoring of any new MPA, each of which is explained in more depth in Section 3.

GENERATIONAL REVIEW

The Forum recommends a guaranteed 25-year generational review for all of the MPAs in the network. This recommendation is an acknowledgement of the importance of each generation's role in the particular Kāi Tahu settlement agreements as part of the Ngāi Tahu Claims Settlement Act 1998.

CO-MANAGEMENT

The Forum recommends that any management structure for an MPA within the network provides for the ability for co-management by Kāi Tahu and the Crown, as Treaty partners. Co-management would enhance the retention and transfer of mātauraka between the generations, and maintain the connection to rohe moana.

The combination of a generational review and co-management is intended to ensure that the role of the Treaty partner is given effect to and there is continuous engagement. The position of Kāi Tahu with regards to each of the Networks is conditional on the generational review and co-management recommendations being implemented.

MONITORING AND REVIEW

The Forum recommends that the management strategy includes a formal, inclusive process to establish a scientifically robust baseline survey and subsequent monitoring programme that can be used to inform any future reviews. This should include participation from central and local government agencies, whānau, hapū and iwi, industry, the scientific community, conservation interests, and, where possible, recreationalists.

COMPLIANCE AND ENFORCEMENT

The Forum emphasises the importance of ongoing compliance as part of its recommendations to Ministers. Compliance and enforcement requirements (including resourcing) should be included within the management strategy if the MPAs are to be effective.

¹² The New Zealand Biodiversity Strategy Objective 3.6 is to: "Protect a full range of natural and marine habitats and ecosystems to effectively conserve marine biodiversity, using a range of appropriate mechanisms, including legal protection." One of the actions that supports this is to: "Achieve a target of protecting 10 percent of New Zealand's marine environment by 2010 in view of establishing a network of representative protected marine areas." Note: the target date has since been superseded and is now 2020 as a result of the Aichi target 11.

KŌIWI TĀKATA AND CULTURAL MATERIALS

The Forum recommends that the retrieval of any kōiwi tākata that are unearthed by natural or other means in an MPA should be an exception to any rule or regulation that prevents the disturbance of an MPA.

The Forum recognises that protocols regarding the provision of access to cultural materials (including stranded marine mammal remains) are now a common practice or courtesy exercised between the Department of Conservation and manawhenua at the time of a marine mammal stranding. Therefore, the Forum recommends that provision for this important custom be included in the conditions for any MPA.

TRANSIT

The Marine Reserves Act 1971 already allows for the transit, sheltering and anchoring of any vessel through a Marine Reserve provided that no fishing gear is in the water. The Forum recommends that explicit guidance language be adopted that vessels, including fishing vessels, are permitted to transit through all MPAs and shelter in them when necessary even with catch on board.

PETROLEUM, GAS OR MINERAL EXPLORATION

The Forum recommends that bottom disturbance and seismic testing associated with any activity, including petroleum, gas or mineral exploration or extraction, should be prohibited in the MPAs.

General recommendations and observations

The Forum process has been valuable not only for providing the recommended MPAs detailed in Section 2 of this report, but also for developing general recommendations that are beyond the scope of the MPA Policy and the Forum's Terms of Reference. Section 4 sets out these general recommendations in terms of land-based impacts, cross-boundary issues beyond 12 NM, fisheries management (particularly recreational fishing) and seismic testing.

The Forum has also identified key points that some members found to be a hindrance to the Forum's ability to reach a greater level of consensus relating to displacement, rebalancing, spillover, customary tools and a lack of belief for the efficacy or need for Marine Reserves to protect biodiversity. The Forum considered it valuable to record these points and provide corrective recommendations to assist future decision makers in this space, and so these are detailed in Section 5.

1.

SETTING THE SCENE



1.1 TREATY OF WAITANGI

1.1.1 Overview

The South-East Marine Protection Forum (the Forum) has been cognisant of the need to understand and actively take into account Kāi Tahu rights and interests when recommending sites for marine protection. This section sets out the Forum’s understanding of relevant legislation, Marine Protected Areas Policy and Implementation Plan¹³ (MPA Policy) considerations and concepts as they pertain to Kāi Tahu rights and interests under the Treaty of Waitangi in respect of the marine environment.

The Forum has also noted that:

- The Crown has acknowledged Kāi Tahu rights as manawhenua, under the Treaty of Waitangi through various pieces of legislation, including the Te Rūnanga o Ngāi Tahu Act 1996 and the Ngāi Tahu Claims Settlement Act 1998.
- The Waitangi Tribunal found that Kāi Tahu have lost ownership and control over important mahika kāi and that the development of pastoral farming has resulted in the wholesale destruction of the natural habitats that sustained these resources. Mahika kāi was, and still is, a fundamental part of tribal life, and consequently was a significant part of the ‘Ngāi Tahu Claim’. The Waitangi Tribunal affirmed Kāi Tahu customary rights within its tribal territories, which include the coastal marine area from Timaru southward to Waipapa Point.

1.1.2 Legislation

Various pieces of legislation are relevant to the Forum process and the implementation of any new Marine Protected Areas (MPAs). This legislation includes provisions that recognise and provide for Kāi Tahu rights and manawhenua, namely:

- The Conservation Act 1987 – it is required that this Act and legislation that is administered under it, including the Marine Reserves Act 1971, must be interpreted and administered to give effect to the Treaty of Waitangi. The words ‘give effect’ place a strong onus on the Department of Conservation (DOC) to ensure that the principles of the Treaty are appropriately observed and applied.¹⁴
- The Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 – this Act settled Māori commercial fisheries claims.
- The Fisheries Act 1996 (the Fisheries Act) – this Act must be interpreted, and people who exercise powers under it must act, in a manner that is consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (Fisheries Settlement Act).¹⁵
- The Ngāi Tahu Claims Settlement Act 1998 – which reflects the Deed of Settlement entered into between the Crown and Te Runanga o Ngāi Tahu in 1997. (See sections 1.1.7 and 1.1.8 for details on specific provisions).

¹³ Department of Conservation; Ministry of Fisheries 2005: Marine Protected Areas: Policy and Implementation Plan. p. 25.

¹⁴ See section 4 of the Conservation Act.

¹⁵ See section 5(b) of the Fisheries Act.

1.1.2.1 CUSTOMARY FISHERIES

The Fisheries Act requires consultation with Kāi Tahu, and the provision for their input and participation as manawhenua before undertaking any action, such as closing an area for sustainability reasons. This consultation includes having particular regard to kaitiakitaka. Part 9 of the Fisheries Act¹⁶ includes provision for the:

- Establishment and management of taiāpure local fisheries.¹⁷
- Making of regulations to recognise and provide for customary food gathering and the special relationship between Kāi Tahu as manawhenua and places of importance for customary food gathering.¹⁸
- Temporary closure of any area to recognise or provide for the use and management practices of Kāi Tahu as manawhenua in exercising non-commercial fishing rights by improving the availability and/or size of a species of fish, aquatic life or seaweed, or by recognising a customary fishing practice in an area.¹⁹

In addition to the provisions of the Fisheries Act, Kāi Tahu customary fisheries are provided for through the Fisheries (South Island Customary Fishing) Regulations 1999 (the Regulations), which arose from the Treaty of Waitangi (Fisheries Claims) Settlement Act. Under the Regulations, Kāi Tahu may notify Takata Tiaki/Kaitiaki for confirmation by the Minister of Fisheries (refer to Section 1.1.4) and may apply for the establishment of mātaimai reserves (identified traditional fishing grounds established as a mātaimai reserve under the Regulations). Kāi Tahu may also nominate Takata Tiaki/Kaitiaki for mātaimai reserves for appointment by the Minister of Fisheries.

Prior to the Fisheries Settlement Act, New Zealand courts recognised that customary fishing rights were not limited to those recognised in statute but were also derived from common law.²⁰

1.1.3 Marine Protected Areas Policy

Planning Principle 3 of the MPA Policy states that ‘The special relationship between the Crown and Māori will be provided for, including kaitiakitaka, customary use and mātauranga²¹ Māori’. This requires the observance of obligations arising from Treaty of Waitangi commitments to manawhenua and ensures effective participation at an early planning stage. Planning Principle 5 also requires consideration of the impacts on customary use rights and for the Forum to minimise any such impacts in selecting areas to recommend as MPAs.

A customary authority will enable Kāi Tahu to use marine resources in Type 2 MPAs in the same way as could be enabled in areas not subject to Type 2 MPAs.²²

¹⁶ Part 9 of the Fisheries Act reflects the provisions of section 10 of the Fisheries Settlement Act.

¹⁷ Fisheries Act, sections 175–185.

¹⁸ Ibid, section 186.

¹⁹ Ibid, section 186b.

²⁰ E.g. *Te Weehi v Regional Fisheries Officer* (1986) 1 N.Z.L.R. 682.

²¹ Traditional knowledge; in the Kāi Tahu dialect, the equivalent term is mātauraka.

²² With the exception of emergency measures, where there is any inconsistency between the Fisheries (South Island Customary Fishing) Regulations 1999 (the Customary Regulations) and other regulations made under the Fisheries Act 1996, the Customary Regulations prevail (see reg. 4 of the Customary Regulations). The Customary Regulations provide for Takata Tiaki / Kaitiaki to issue customary authorisations.

1.1.4 Kaitiakitaka

The function of kaitiaki is a practical expression of rakatirataka, the active duty for each generation to protect, manage and ensure the sustainable use of natural resources for the benefit of current and future generations. This function extends to all corners of the domains of influence of whānau and hapū to recognise interconnections with the natural environment, including the domains of the deities Takaroa and Tāne, the guardians of the sea and bird life, respectively. It has been informed by generations of use and protection of coastal marine resources underpinned by customary values and a duty to exercise a role that is akin to guardianship and the wise care and management of resources.

The cumulative effects of activities that use the land and sea in the present day challenge the role of kaitiakitaka. Nevertheless, the duty to act as kaitiaki remains constant. Active participation and engagement in groups such as the Forum are central to exercising kaitiakitaka and recognising the mana of the respective Kāi Tahu interests in the Forum region.

Crown recognition of the kaitiaki role includes the confirmation of Tākata Tiaki / Kaitiaki under the Regulations. Tākata Tiaki / Kaitiaki are notified by manawhenua and, once confirmed, are able to issue authorisations for customary fishing within their rohe. Tākata Tiaki / Kaitiaki appointed for mātaurai reserves can also make bylaws that restrict or prohibit fishing to advance the sustainable management of fisheries in specific mātaurai reserves. These are some of the ways that Kāi Tahu whānui are able to manage customary food gathering within their rohe.

An important function of the Forum process has been the careful observance and understanding of the kaitiaki function and the values and interests of the respective manawhenua. Giving effect to the Kāi Tahu kaitiakitaka has been an active and conscious component of the Forum's focus.

1.1.5 Mātauraka

Mātauraka in the context of the Forum's process is a representation of the customary knowledge that has been accumulated by generations of Kāi Tahu whānau and hapū through co-existence with and the use and protection of their natural resources – a knowledge base that is framed in a context of reciprocity, give and take, and respect for the creation traditions that speak of interconnection between the people and the resources of the land and sea.

The exercise of customary use, for example through shellfish gathering or fishing that observes sustainable use principles, maintains and assists the transfer of mātauraka from generation to generation. Traditional accounts of species, places, seasons and fishing or gathering methodologies are an important component of mātauraka. The cultural identity and indeed mana of Kāi Tahu whānau and hapū is linked to the use, wellbeing and life-supporting capacity of their natural resources and environment including the marine habitat. For Kāi Tahu, it is important to maintain traditional practices including ahi kaa (keeping the home fires burning, continuous occupation).

A key concern of Kāi Tahu rūnaka and whānau has been the continued ability to maintain and transfer mātauraka from generation to generation. The Forum has been conscious of this imperative and has endeavoured to give effect to this important cultural function.

The inter-generational connection that Kāi Tahu have traditionally held with their marine territories is under threat from the MPA process and this is particularly accentuated with the no-take Marine Reserve. To better provide for this connection, the Forum is recommending a generational review for any MPAs that are established under this process (refer to Section 3.1). Kāi Tahu seeks that any such review includes the goal of establishing a customary role for the local papatipu rūnaka (regional assemblies) to exercise wanaka (schools of learning) that include sampling and strategic take for the purpose of enhancing mātauraka, customary practices and the retention of the generational connection with the rohe moana.

Kāi Tahu is also seeking for a co-management function to be applied across all MPAs, consistent with the Treaty partnership principle (see Section 3.2). This is particularly important for the recommended Marine Reserves. As no-take areas, Kāi Tahu considers that Marine Reserves essentially isolate and alienate hapū from that part of their marine domain. Co-management would actively recognise the mana and engagement of Kāi Tahu in the management of any MPAs that are established, recognising intergenerational connections to the past, present and future.

1.1.6 Manaakitaka

Manaakitaka is a key cultural value – the ability to share kai and appropriately host visitors at home or the marae is highly valued. Similarly, the custom ‘kai hau kai’ is the gathering of whānau and hapū to celebrate and share mahika kai from across the rohe. The ability to share kai that has been sourced locally honours one’s guests, while the inability to access such kai impacts on the mana of the host and is a source of shame. A key concern for Kāi Tahu has been the encroachment of MPAs on the ability of whānau and hapū to provide kai for the table, and to host and share customary fishery resources in the time-honoured fashion.

1.1.7 Taoka species

Schedules 97 and 98 of the Ngāi Tahu Claims Settlement Act set out ‘Taonga Species’ (highly prized species).²³ These schedules list a number of seabirds, marine mammals, shellfish and fish species, as well as a species of kelp. The list of taoka species that was agreed on with the Crown does not include some species that have been brought into the commercial Quota Management System, therefore, the schedules are not an exhaustive list of taoka species that are of importance to Kāi Tahu. All native species are treasured by Kāi Tahu.²⁴

Sections 288 and 298 of the Ngāi Tahu Claims Settlement Act are intended as an acknowledgement by the Crown of the cultural, spiritual, historic and traditional associations of Kāi Tahu with the taoka species listed in the Act. Under the Act, the Ministers of Conservation and Fisheries have obligations (in relation to these taoka species) to:

- Advise and consult with Te Rūnanga o Ngāi Tahu.
- Have particular regard to their advice as an advisory committee.
- Recognise and provide for the association of Kāi Tahu with the taoka species.

²³ In the Kāi Tahu dialect, the ‘ng’ becomes a ‘k’ i.e., taonga becomes taoka.

²⁴ See Appendix 6.1 – Taonga Species Ngāi Tahu Claims Settlement Act Schedules 97 & 98.

Such obligations arise:

- For the Minister of Conservation when reviewing any relevant conservation management strategy reviews or any non-statutory actions pertaining to taoka species, or when making policy decisions concerning the protection, management, use or conservation of a taoka species.²⁵
- For the Minister of Fisheries when making policy decisions concerning the protection, management, use or conservation of the taoka fish species within the Kāi Tahu claim area.²⁶

1.1.8 Statutory acknowledgements

Statutory acknowledgements that are relevant to the Forum region are set out in the schedules to the Ngāi Tahu Claims Settlement Act. These include statutory acknowledgements for:

- ‘Te Tai o Arai Te Uru’ (Otago Coastal Marine Area (Schedule 103, Ngai Tahu Claims Settlement Act. Also, see Figure A6-1))
- The ‘Waitaki River’, including the river mouth²⁷
- The Mata-au Clutha River, including the river mouth.²⁸

In each Statutory Acknowledgement, the Crown acknowledges the particular cultural, spiritual, historic and traditional association of Kāi Tahu with the subject area. Each Statutory Acknowledgement contains a narrative describing the traditional association of Kāi Tahu to the area.

1.1.9 Māori Reserves and South Island Landless Native Act 1906 Lands

Māori Reserve lands are generally allocated in proximity to areas of traditional significance, such as traditional settlements, mahika kai, kaimoana and sea fishery resources. This is not, however, the case for South Island Landless Native Act (SILNA) lands, which were principally allocated in the early 1900s, and are located in remote and difficult-to-access locations.

The reliance on kaimoana and the sea fishery for both Māori Reserve and SILNA landowners took on a heightened importance as compensation for remote and difficult-to-develop SILNA lands. This has been a significant factor affecting the willingness of Kāi Tahu to accept sites as potential MPAs.

²⁵ Ngāi Tahu Claims Settlement Act, sections 293 and 304.

²⁶ Ibid, section 303.

²⁷ Ibid, schedule 82.

²⁸ Ibid, schedule 40.

1.1.10 Kāi Tahu takiwā

Each Kāi Tahu papatipu rūnaka has its own takiwā (district). These takiwā and their boundaries are noted in Schedule 1 of the Te Rūnanga o Ngāi Tahu (Declaration of Membership) Order 2001. The takiwā that occur within the Forum region are the takiwā of:

- Te Rūnaka o Arowhenua, which centres on Arowhenua and extends from Rakaia to Waitaki, sharing interests with Ngāi Tuahuriri ki Kaiapoi between Hakatere and Rakaia, and thence inland to Aoraki and the Main Divide.
- Te Rūnaka o Waihao, which centres on Wainono and extends inland to Ōmarama and the Main Divide, sharing interests with Te Rūnaka o Arowhenua to Waitaki.
- Te Rūnaka o Moeraki, which centres on Moeraki and extends from Waitaki to Waihemo and inland to the Main Divide.
- Kāti Huirapa Rūnaka ki Puketeraki, which centres on Karitāne and extends from Waihemo to Purehurehu and includes an interest in Ōtepoti and the greater harbour of Ōtākou. This takiwā extends inland to the Main Divide, sharing an interest in the lakes and mountains to Whakatipu-Waitai with rūnaka to the south.
- Te Rūnaka o Ōtākou, which centres on Ōtākou and extends from Purehurehu to Te Mata-au and inland, sharing an interest in the lakes and mountains to the western coast with rūnaka to the north and south.
- Te Rūnaka o Awarua, which centres on Awarua and extends to the coasts and estuaries adjoining Waihopai, sharing an interest in the lakes and mountains between Whakatipu-Waitai and Tawhititarere with other Murihiku rūnaka and those located from Waihemo southwards.

The fisheries management boundaries that were established for the purposes of the Quota Management System do not align with these takiwā. One consequence of this non-alignment is that when a mātaimai reserve is established in the takiwā of one rūnaka, it has implications for the ability of another rūnaka to have a mātaimai reserve established in its takiwā.

An earlier established mātaimai reserve will reduce the total area that is available for commercial fishing within the relevant quota management area. This will increase the likelihood that the Minister of Fisheries will decline a later mātaimai reserve application when applying 'the prevent test' which considers the ability of fishers to take their quota within the quota management area for relevant species.

Within the Forum region, the coastal delineation of the rūnaka is as follows: Te Rūnaka o Arowhenua extends from Timaru to Waitaki, sharing the area from Pareora south to the Waitaki with Te Rūnaka o Waihao. Te Rūnaka o Moeraki extends from Waitaki to the Waihemo River, Kāti Huirapa Rūnaka ki Puketeraki extends from the Waihemo River to Purehurehu. Te Rūnaka o Ōtākou extends from Purehurehu to the Mata-au (Clutha River) and Te Rūnaka o Awarua extends from the Mata-au (Clutha River) southward.

At the outset of the process, Kāi Tahu were initially offered two places for representation on the Forum. This was increased to three representatives with each representative having an alternate, upon the request of Kāi Tahu. The task for two would have been untenable.

1.2 NATURAL ENVIRONMENT OF THE FORUM REGION

1.2.1 Oceanography

The marine environment of the south-east region of New Zealand is strongly influenced by the Southland Current, which is bounded to the east by a global oceanic boundary called the Subtropical Front. The Southland Current flows northwards over the continental shelf carrying a unique mix of cold, nutrient-rich water from the subantarctic region and subtropical water from the Tasman Sea.

As the Southland Current sweeps north, it produces habitat and ecosystem variation between the southern and northern areas of the south-east region, and sea surface temperature variation between summer (11–13°C) and winter (9–10°C). Where the continental shelf narrows, particularly off the Otago Peninsula, high biological productivity arises from the deeper, cooler water and upwellings.

The main wave exposure is from the south to northeast, with the dominant waves coming from the south. These waves create an exposed coastal environment over most of the region. In places, the structure of the seabed and physical features of the coast provide for more varied habitats. For example, more sheltered areas occur north of the Otago Peninsula, as well as behind smaller headlands and within bays.

The coast is also exposed to tidal currents, which can intensify the movement of sediments and affect marine life close to headlands and the mouths of rivers and estuaries. Winds can also reinforce waves and currents, build coastal sand dunes, and dry the intertidal zone.

The Mata-au (Clutha River) is the biggest river by volume in New Zealand, and has a major influence on the chemistry and productivity of the neritic (shelf) waters, and on the coastal sedimentation and geomorphology from Tokatā (Nugget Point) to Karitāne.

1.2.2 Landforms

The region shows significant variation in coastal landforms from north to south. Shores range from sandy, pebble, cobble and boulder beaches to wave-cut rock platforms and estuarine environments behind river mouths. Offshore, the continental shelf generally extends beyond the 12-nautical mile (NM) boundary of the territorial sea, with the exception of a few locations where canyons enter the Forum region off the Otago Peninsula.²⁹

²⁹ Sutton, P.J.H. 2003: The Southland Current: a subantarctic current. *New Zealand Journal of Marine and Freshwater Research* 37: 645–652.



Figure 1-1: Map showing the Forum region

The extent of the region is shown by the red boundary from Waipapa Point to Timaru and out to 12 NM.

These north–south differences are some of the defining features that divide the inshore coastal marine environment into geographical sub-regions (coastal units). These include:

- Canterbury Bight: a coastline that is dominated by mixed sand and gravel beaches and braided rivers, with hāpua (estuarine) lagoons³⁰ at their outlets to the sea.
- North Otago: a sedimentary rock coast, with shallow subtidal reefs supporting forests of giant bladder kelp (*Macrocystis pyrifera*) as well as deeper reefs.
- Otago Peninsula: a prominent volcanic landform that strongly influences coastal currents; it is bordered seaward by a narrow shelf, resulting in deep water and canyons being found quite close inshore.
- Clutha: a coastline that is strongly influenced by fresh water and sediment from the Matau-au (Clutha River).
- The Catlins: a cliffed and embayed coastline with old erosion-resistant sedimentary rocks that is influenced by strong tidal currents and the outflow from Te Ara a Kiwa (Foveaux Strait).

1.2.2.1 BIODIVERSITY

Much of the biodiversity in the marine environment is hidden from sight. The information that does exist in a reliable form tends to relate to large-scale structures (biogenic habitats), large-bodied wildlife (birds, marine mammals) or small areas where individual studies have been undertaken. This lack of detailed biodiversity information is why the MPA Policy uses ‘habitat types’ as a surrogate for biodiversity.

The landforms and oceanography together with the climate of the Forum region strongly influence the marine environment, creating complex patterns of marine habitats and biodiversity – and this complexity is further influenced by depth and varying levels of wave exposure.

1.2.3 Habitat types in the Forum region

1.2.3.1 DEEP SUBTIDAL HABITATS (>30 m DEPTH)

The continental shelf is an area of gently shelving seabed that extends out from the coastline. In the south-east region, this shelf varies in width from approximately 29 km to 33 km north and south of the Otago Peninsula, to less than 10 km adjacent to it. The outer shelf and upper slope are incised by eight canyons, of which two (Papanui and Saunders) project substantially within the 12 NM boundary of the Forum region.

Offshore, the shelf is generally smooth and dominated by soft-sediment habitats. Patchy land-derived gravels, sands and muds extend offshore to a depth of approximately 30–70 m. Beyond this, seafloor sediments are predominantly relict sands and biogenic sand and gravel.

There is relatively little literature on the biology of the deep subtidal shelf area. The main research focus has been on an extensive area of bryozoan beds on the mid and outer shelf directly east of the Otago Peninsula.

³⁰ Hāpua lagoons form at river mouths, are elongated, and are separated from the sea by a barrier of mixed gravel and sand.

From about 70 m depth to the shelf break, large, heavily calcified bryozoans are abundant and dominate an area of approximately 110 km². Bryozoan beds such as this are rare globally and are uncommon in New Zealand waters. Where they occur at sufficient densities, bryozoans enhance the local biodiversity by providing attachment surfaces for invertebrates such as anemones and places for other animals to hide from predators.

Microscopic marine plants (phytoplankton) growing on the mid and outer shelf feed an abundance of tiny animals (zooplankton) and small fishes that play an important role in the shelf food web. Swarms of squat lobsters (*Munida gregaria*) are also a feature of the Otago shelf ecosystem. During their early life stages, squat lobsters live in the water column, whereas the adults inhabit the mid-shelf bryozoan thickets on the seafloor.³¹

Many fishers will be familiar with the reefs in their favourite spots. However, reliable records about the actual size and location of offshore rocky reefs are not available. Reefs have been recorded at mid-shelf depths off Makikihi; southeast of Katiki Point, Moeraki; south-east of the Otago Peninsula; and off Hākinikini (Quoin Point).

1.2.3.2 INTERTIDAL AND SHALLOW SUBTIDAL HABITATS

A general pattern of intertidal and subtidal habitats is apparent across the region and described below. However, this varies considerably at local scales within the region.

Moderately exposed coastal rocky reefs north of the Otago Peninsula are characterised by subtidal forests of the giant bladder kelp at depths shallower than 30 m.

South of the peninsula, the coastline is very exposed to large southerly swells where the shallow subtidal rocky reefs are dominated by dense stands of the rimurapa (bull kelp) *Durvillaea* spp.

Below 3 m depth, *Lessonia variegata*, *Marginariella* spp. and *Carpophyllum flexulosum* are the dominant brown kelp species. The understory consists of a diverse assemblage of small red seaweeds, and a variety of sponges, bryozoans and solitary ascidians (a type of filter-feeding invertebrate).

Beaches and subtidal sediments contain several shellfish species that, in some places, create extensive shellfish beds (e.g. tuaki (cockles), kūkuku (horse mussels)), as well as other living organisms such as marine worms (polychaetes) and crustacea (e.g. crabs). These beds can hold the sediment together, helping to prevent it from being washed away and creating habitats for other animals.

1.2.3.3 ESTUARINE HABITATS

Estuarine habitats are found at more than 30 places in the Forum region. These habitats include areas of tidal sandflat and mudflat that support saltmarsh vegetation, seagrass beds, shellfish beds and aquatic birdlife. Seagrass is often present in intertidal areas and provides habitat for many plants and animals, as well as helping to prevent the sediments from being washed away.³²

³¹ Zeldis, J.R.; Jillet, J.B. 1982: Aggregation of pelagic *Munida gregaria* by coastal fronts and internal waves. *Journal of Plankton Research* 4(4): 839–857.

³² See Vol II Consultation Document, Appendix 5: Significance of seagrass ecosystems in coastal environments.

Estuaries provide an important nursery habitat for many types of fish, particularly pātiki (flatfish)³³ and galaxiids. They are also an important part of the migration paths of a range of fishes and birds, such as native and sports fish, wading birds (e.g. karoro (godwits), matuku moana (herons)) and seabirds.

1.2.3.4 BIOGENIC HABITATS

Biogenic habitats are habitats that are formed by living organisms or their remains. They include the deeper areas of bryozoan beds,³⁴ shellfish beds, sponge gardens and tube worms, as well as giant bladder kelp forests on rocky coasts in water that is less than 30 m depth.³⁵ In estuarine areas, biogenic habitats include shellfish beds, seagrass beds and saltmarshes.³⁶

Observations by fishers and others indicate that a variety of biogenic habitats occur throughout the coast of the Forum region from Te Ara a Kiwa (Foveaux Strait) (bryozoans) to North Otago (bryozoans, sponges and tube worms) and north beyond Timaru (tube worms).

Biogenic habitats are well recognised as being important for biodiversity, and provide areas of refuge and nursery grounds for a variety of fish species. For example, juvenile tarakihi (*Nemadactylus macropterus*) are associated with tube worm habitats up the east coast of the South Island, and rawaru (blue cod *Parapercis colias*) are associated with biogenic habitats in Te Ara a Kiwa (Foveaux Strait), as well as with the Otago bryozoan beds.

1.2.4 Protected wildlife

The waters that extend from the coast to out over the continental shelf are also an important foraging area for marine mammals and seabirds,³⁷ including species protected under the Wildlife Act 1953 and Marine Mammals Protection Act 1978.

Threatened hoiho (yellow-eyed penguins *Megadyptes antipodes*) nest on the coast of The Catlins and the Otago Peninsula, as well as on the north Otago coast. Hoiho spend considerable amounts of time foraging for benthic prey over the sea floor and adjacent shelf. Kekenō (New Zealand fur seals *Arctocephalus forsteri*) and a small population of the endangered rāpoka (New Zealand sea lion *Phocarctos hookeri*) also breed in the region.

Prior to commercial whaling, the region was the most important calving area for kewa (southern right whales *Eubalaena australis*) in New Zealand. As the population recovers, these whales are now frequently sighted off the Otago coast, particularly during the winter months.

The endangered pahu (Hector's dolphin *Cephalorhynchus hectori*) inhabits coastal waters around the Otago Peninsula, north of Moeraki and the southern Catlins near Waikawa Harbour / Porpoise Bay.

Mako taniwha (great white sharks *Carcharodon carcharias*) and mako (basking sharks *Cetorhinus maximus*) occur seasonally off the Otago coast but little is known of their movements or habitat requirements.

³³ Flounder, sole, turbot (*Scophthalmus maximus*) and brill (*Scophthalmus rhombus*) are referred to collectively as flatfish.

³⁴ Bryozoans are small (typically about 0.5 mm long), filter-feeding invertebrates. Large numbers of bryozoans together make up bryozoan beds. For additional information on bryozoans, see Vol II Consultation Document.

³⁵ For additional information on kelp forests, see Vol II Consultation Document: Appendix 5: Significance of seagrass ecosystems in coastal environments.

³⁶ Salt marshes are areas of grassland that get flooded by seawater.

³⁷ See Vol II Consultation Document, Appendix 7: South-East Marine Protection Forum Information Sheet – Seabirds.

1.3 SOCIAL AND ECONOMIC CONTEXT

1.3.1 People and communities

The south-east coast is of cultural significance to Kāi Tahu – an ancestral landscape that is immortalised in creation traditions, rich in historical terms and a bountiful provider of kai moana. The south-east region of Te Waipounamu was settled over 800 years ago, first by the Waitaha, who were followed by the Kāti Māmoe and finally Kāi Tahu. These three iwi (tribes) merged over time and are known today as Kāi Tahu. The term ‘whānui’ is often added to indicate the broad encompassing nature of the name Kāi Tahu, which includes the three iwi.

Kāi Tahu whānui established settlements in the coastal and inland regions, and a network of mahika kai. The fishing and gathering of shellfish such as pipi, tuatua and toheroa from the sandy shallows, kutai (mussels), pāua, limpets, kina (sea urchins) and seaweed were important customary activities and remain so to this day.

The Treaty of Waitangi (Māori Fisheries) Settlement Act 1992 transferred fishing entitlements and assets including commercial quota to all Māori, including Kāi Tahu. Protecting the ongoing integrity of this settlement asset is an everlasting Treaty duty.

European settlers first arrived on the south-east of the South Island in the late 1700s, hunting paika (whales) and seals. They were followed by more formal settlement from the 1840s at which time Ōtepoti (Dunedin) was founded.

Today, Dunedin has a population of approximately 120,000 and is also home to Port Otago, a major South Island trading port. Timaru is another major port city with a population of about 43,000 and is a popular coastal resort in summer. Oamaru, with a population of about 13,000, is the next sizeable township on the coast.

Coastal communities are dotted along the coastline from Timaru to Waipapa Point. While many have a small number of permanent local residents, their populations swell during holiday periods when crib owners and visitors come to enjoy the coastline. These include Kakanui, Moeraki, Matakaea (Shag Point), Waikouaiti, Karitāne, Warrington, Waitati, Purākaunui, Long Beach, Aramoana, Harington Point, Ōtākou, Portobello, Brighton, Taieri Mouth, Bull Creek, Toko Mouth, Kaitangata, Kaka Point, New Haven, Pounaweia, Jacks Bay, Papatowai, Tautuku, Waikawa and Curio Bay.

The south-east coast offers its community a multitude of recreational opportunities. Most notable amongst these are those that exist because of the nature of the marine environment – its biogeography and the biodiversity that it supports. These include:

- World-class surfing breaks – St Clair Beach is the most widely known but surf spots abound throughout the entire region, including at Aramoana, Karitāne, Whareakeake and Papatowai.
- Good temperate diving at many locations, with large stands of giant bladder kelp and rimurapa (bull kelp) *Durvillaea* spp. being a prominent feature of inshore southern diving. While diving can involve the taking of marine life such as kōura papatea (rock lobster *Jasus edwardsii*), pāua (free diving only) and finfish, it also involves more

aesthetic elements such as underwater photography and viewing the underwater environment for pleasure. Estuarine recreational opportunities include gamebird shooting, bird watching, kohikohi inaka (whitebaiting), flounder fishing, shellfish gathering, kayaking and boating

- Outstanding wildlife – the region is home to some of New Zealand’s most iconic and threatened species, including hoiho (yellow-eyed penguin), rāpoka (New Zealand sea lion), pahu (Hector’s dolphin), koau (Otago shag *Phalacrocorax chalconotus*), toroa (royal albatross *Diomedea epomophora*) and kororā (little penguin *Eudyptula minor*). In addition, more than 50 seabirds forage within the Forum region, and kewa (southern right whale) and other whale species are regularly sighted.

1.3.2 Economic opportunities

1.3.2.1 TOURISM

Tourism, particularly tourism with a wildlife component, is an important and steadily growing contributor to New Zealand’s southern economy, and creates jobs and wealth throughout the region. Local government and communities invest considerable resources in marketing and managing tourism in the region.

The varied landscapes of the coast are significant attractions and marine wildlife viewing is also a popular activity at some shore locations. This includes both recreational viewing and guided tours, and mostly occurs at specific localities where the animals congregate to breed, rest or feed.

Sea-based tourism out of Otago Harbour has been a feature since the 1990s and includes wildlife viewing, particularly of toroa (albatross), koau (shags), penguins and seals. There is also a growing cruise ship tourism sector, with over 100 cruise ships visiting Port Otago annually (115 in 2017–18) and passengers partaking in wildlife tourism.³⁸

These activities particularly focus on the following species (and primary sites):

- Rāpoka (New Zealand sea lion; Otago Peninsula, The Catlins)
- Hoiho (yellow-eyed penguin; north Otago, Otago Peninsula and The Catlins)
- Kororā (little penguin; Oamaru and Otago Peninsula)
- Kekeno (New Zealand fur seal; Otago Peninsula, Nugget Point, Irihuka (Long Point) and Taiaroa Head)
- Toroa (royal albatross; Taiaroa Head)
- Kōau (black shag; Taiaroa Head and environs)
- Pahu (Hector’s dolphin; Timaru to Waipapa Point)
- Other Important Bird Areas³⁹ (seabirds)
- Estuarine waders and shore birds.

³⁸ www.dunedin.govt.nz

³⁹ Important Bird Areas and Conservation. The Royal Forest & Bird Protection Society of New Zealand, Wellington, New Zealand. p. 72.

1.3.2.2 CUSTOMARY FISHERS

Kāi Tahu are manawhenua and hold mana moana (authority over the seas) for the Forum region. Fisheries are a vital resource for Kāi Tahu, not only as a source of food, but also for cultural and recreational purposes. Many fish, shellfish and seaweed species are taoka to Kāi Tahu, and many places are of importance to Kāi Tahu as traditional fishing grounds. Kāi Tahu also hold a significant interest in commercial fishing.

The use and management of non-commercial, customary fisheries by Kāi Tahu is provided for in several ways under fisheries legislation. For example:

- Kāi Tahu propose special management areas – mātaimai reserve⁴⁰ and taiāpure.⁴¹
- Takata Tiaki (fisheries managers)⁴² have a role in the management of fisheries. They can issue customary fishing authorisations and take part in fisheries management processes.

Mātaimai reserves are gazetted reserve areas where Kāi Tahu as manawhenua are able to manage all non-commercial fishing⁴³ by making bylaws. In the Forum region, the seven existing mātaimai reserve are:

- Tuhawaiki (south of Timaru)
- Waihao (in South Canterbury)
- Moeraki (in North Otago)
- Waikouaiti (Estuary and River north of Dunedin)
- Ōtākou (lower Otago Harbour)
- Puna-wai-Toriki (coastline north of Tokatā (Nugget Point))
- Waikawa Harbour / Tumu Toka (on The Catlins Coast).

The establishment of a taiāpure is another way for Kāi Tahu to become involved in the management of both commercial and non-commercial fishing in their area.⁴⁴ There is one taiāpure within the Forum region: the East Otago Taiāpure at Karitāne.

The Forum heard that looking after the marine environment and its resources for future generations is central to Kāi Tahu beliefs and the management of their customary fisheries, as referred to in statutory deeds. The Forum also heard that there are many other places of importance and significance to Kāi Tahu, such as traditional fishing areas, that have not yet been formally recognised.

⁴⁰ Mātaimai reserves can only be applied for over traditional fishing grounds and must be areas of special significance to the manawhenua.

⁴¹ A taiāpure is a local management tool established in an area that has customarily been of special significance to an iwi or hapū as a source of food or for spiritual or cultural reasons (section 174 of the Fisheries Act 1996).

⁴² Takata Tiaki are appointed by the Minister of Fisheries following nomination by manawhenua. Takata Tiaki have a rohe moana (area) for which they are able to issue customary authorisations.

⁴³ Commercial fishing is generally prohibited within mātaimai reserves.

⁴⁴ All fishing, including commercial fishing, can continue in a taiāpure.

1.3.2.3 RECREATIONAL FISHERS

Recreational fishers fish for sustenance, sport and/or recreation. This sector ranges from people who fish regularly to people who may only fish once or twice a year, and from people who throw a line over the wharf or gather shellfish on the shore to people who venture further out to sea in their own boat or a charter vessel – charter vessels operate out of Moeraki, with intermittent trips from Port Chalmers.

Recreational fishers may fish from boats or the shore (the beach, rocks or wharves) and may also fish while diving. Access to their favourite spots is important to recreational fishers and so popular areas are often close to main centres, or are easily reached by road or a short boat trip. However, there are generally limited boat ramps and launching facilities in the area. The Forum heard that many areas that are close to shore and some offshore areas in the Forum region are important to recreational fishers.

Popular species among recreational fishers in the Forum region include pāua, kōura papatea (rock lobster), tuaki (cockles), rawaru (blue cod), pātiki (flatfish), kumukumu (red gurnard *Chelidonichthys kumu*), hoka (red cod *Pseudophycis bachus*), hapūku (bass *Polyprion americanus*), blue moki (*Latridopsis ciliaris*), matahoe (butterfish *Odax pullus*) and kohikohi (trumpeter *Latris lineata*).

Recreational fishers mainly use methods such as rod and line, kontiki, hand gathering, potting, netting and spearing; which, aside from netting, tend not to have significant physical impacts on the environment and so could continue in some types of MPAs.

In addition to its social, cultural and sustenance value, recreational fishing contributes to the economy through such things as boat and equipment sales, and tourism and associated activities.

There are no general reporting requirements for recreational fishing and so we do not have a lot of detailed information about how much people catch, the methods they use or where they fish. The information that is available is limited to some charter vessel reporting⁴⁵ and some relative estimates from surveys of recreational fishers. However, there can be quite a lot of uncertainty around some estimates due to the relatively small sample sizes in areas of low population density.

Ministry for Primary Industries (MPI) is responsible for managing marine recreational fishing.⁴⁶ The main controls on recreational fishing are bag and size limits; restrictions on methods and gear; and restricted and closed areas. These controls are used to help protect fishing resources to ensure that there are enough fish for the future and to protect the environment.

⁴⁵ Currently, reporting is required for hapūku (bass), rawaru (blue cod), matiri (bluenose *Hyperoglyphe antarctica*), kōura papatea (rock lobster), hapūku (groper), haku (kingfish *Seriola lalandi*), southern bluefin tuna (*Thunnus maccoyii*) and Pacific bluefin tuna (*T. orientalis*).

⁴⁶ Freshwater fisheries for trout (*Salmo trutta*) and salmon (*Oncorhynchus* spp.) are managed by Fish & Game New Zealand.

1.3.2.4 COMMERCIAL FISHERS

The Forum region has a diverse commercial fishing sector that is made up of large national companies, smaller local companies and independent fishers. Many of the fishers are locally based and may own quota shares or acquire annual catch entitlement from a number of quota owners to supplement their catch plan for the year. Commercial fishers may own and fish their own quota⁴⁷ (or acquire annual catch entitlement) to catch a certain amount of a particular fish stock or group of stocks from quota-owning individuals or companies. With minor exceptions, all of their catch has to be landed to a licensed fish receiver who may be a small independent company or one of the larger companies with offices in a number of regions. A penalty regime is in place whereby a deemed value will be charged to fishers who are unable to cover their catch with the annual catch entitlement at the end of the fishing year. The deemed value is a figure that is set at a percentage of the port price and in some instances above it.

The Forum region is part of a larger fisheries management area (FMA3)⁴⁸ and fish caught within this area may be landed for processing locally or in some instances outside the region. There is an important export market for fresh and frozen fish, much of which is marketed internationally. The domestic market for fish includes restaurants, supermarkets, specialty fish mongers and takeaway shops.

Most inshore commercial fishers target a number of fish species, with important fish species in the Forum region including pāua, tuaki (cockles), kōura papatea (rock lobster), pātiki (flatfish), rawaru (blue cod), hoka (red cod), tarakihi, mako (school shark *Galeorhinus galeus* and rig *Mustelus lenticulatus*), mako repe (elephant fish *Callorhinchus milii*), kumukumu (red gurnard) and stargazer. Methods used include potting, hand gathering, trawling, set netting and Danish seining. Inshore commercial fishing vessels accordingly range from small inflatable boats to medium sized vessels (trawlers).

All vessels are required by regulation to report their catch and landings to MPI and vessels over 6 m overall length are required to maintain logbooks onboard. The majority of the assessments for abundance levels of fish stocks are a consequence of the commercial fisheries reporting and surveys that are paid for by the commercial sector under cost recovery.⁴⁹

Commercial fishing continues to be an important part of many south-east coast communities and families. The Forum heard that maintaining that way of life is important to people for employment, the regional economy and simply to maintain fish in the diet. Not everyone is able to go recreational fishing and therefore many people rely on the commercial sector for their fish.

Commercial fishing is an important employer and contributor to the economy, both directly and indirectly. For example, the Dunedin seaport ranks as New Zealand's third or fourth largest exporter of fish each year based on dollar value.

⁴⁷ Not all species are managed within the Quota Management System. Catches of species that are managed outside this are monitored, but are not subject to total allowable catch limits. If catch levels or other information suggests it is necessary, new species of stocks can be added to the Quota Management System for closer management.

⁴⁸ A small part of FMA5 also forms part of the Forum region between Slope Point and Waipapa Point.

⁴⁹ For more information on commercial fishers, the Quota Management System and regulations, please refer to www.seafood.org.nz.

1.4 THE FORUM PROCESS

1.4.1 Introduction

In 2014, the then Minister of Conservation, Hon. Dr Nick Smith, and the then Minister for Primary Industries, Hon. Nathan Guy, appointed the Forum to undertake a collaborative process to consider and recommend marine protection options for the South Canterbury, Otago and Southland regions. Since its inception, the Forum has engaged with the local community and considered the protection needs of the coastal marine area between Timaru and Waipapa Point in Southland, out to 12 NM (22.2 km) from the coast, and including the lower estuarine reaches of some 30 rivers.

Most of the 16 Forum members come from the south-east South Island community, with one member from Nelson, and various representative organisations. Manawhenua and a diverse range of community interests and users of the marine environment are represented, including commercial and recreational fishers, local government and communities, and the environmental, science and tourism sectors.⁵⁰

The principal objective that has guided the work of the Forum was to:

Provide a report for Ministers recommending levels of marine protection for the Otago sub region of the Southern South Island biogeographic region, consistent with the MPA Policy and MPA Guidelines.⁵¹

The objective of the MPA Policy⁵² is to:

Protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of New Zealand's marine habitats and ecosystems.

1.4.2 Engagement

The Forum endeavoured to meet with a diverse range of interested people to provide them with an opportunity to speak with Forum members and express their viewpoints. Engagement with stakeholders also enabled the Forum to gather information about locations that were important to the local community and the reasons for this importance. The Forum has used the information gathered during this process, as well as the content of the submissions from the formal consultation process, to enhance its understanding of the marine environment and communities of interest in the south-east of the South Island, and to deliver informed recommendations.

⁵⁰ A list of current and past members is included in Appendix 3.2, along with further detail about the Forum and its process.

⁵¹ See the Forum's Terms of Reference in Appendix 3.3.

⁵² More information on MPA planning is set out in Appendix 2.

The process followed by the Forum involved constructive engagement with manawhenua, the public, stakeholders and government agencies, which was consistent with Planning Principle 4 of the MPA Policy and the guidance set out in the Marine Protected Areas Classification, Protection Standard and Implementation Guidelines (the MPA Guidelines).⁵³ Certain stages of the process involved in-committee deliberations to allow the free and frank expression of opinions. Engagement⁵⁴ included:

- A series of public meetings held throughout the south-east of the South Island
- An online questionnaire ‘Our Sea Your Say – Kei a Koe Te Tikaka’
- The online tool SeaSketch⁵⁵
- Facebook
- An 0800 number
- Formal consultation on proposed sites
- Representation from Forum members at numerous hui, events, and stakeholder and public meetings.

The Forum participated in two science workshops in April and July 2015. Topics discussed from invited scientists included science in the region, designing Marine Reserves, the relationship between size and reproduction in fish species, oceanography, recruitment and dispersal, seabirds, bryozoans, rawaru (blue cod), marine mammals, MPA effects, historical changes in the marine environment, reef ecosystems, soft-sediment ecosystems and estuaries.

1.4.3 Formal consultation

In the process of developing sites for public consultation, more than 100 sites and site variations were proposed by various sectors and considered by the Forum. Sites such as Matakaea (Shag Point), Kaimata (Cape Saunders), Papanui Inlet and Tokatā (The Nuggets) were eliminated as part of the ‘gifts and gains’ approach to decision making in recognition of their significance to customary owners. Reasonable concessions were also made to commercial fishing interests in an attempt to minimise the adverse impact on fisheries. Concessions were similarly made to avoid sites that are of recreational importance.

Following the engagement process, the Forum narrowed down the number of sites to be formally consulted on to 20, as well as seeking general comments from submitters on potential networks and possible additional sites. Agreeing on the specific sites for consultation involved significant concessions being made by all Forum members on behalf of their stakeholders and did not represent agreement that the 20 sites were a recommended network for protection. Rather, the Forum agreed to formally gather information through the submission process on those 20 sites and how they might contribute to a network.

⁵³ Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. Ministry of Fisheries and Department of Conservation, Wellington. p. 15–17.

⁵⁴ The stakeholder engagement process is set out in more detail in Appendix 3.6.

⁵⁵ SeaSketch is a valuable resource that supports collaborative marine spatial planning and provides easy-to-find marine information (see southeastmarine.seasketch.org). See Appendix 3.7 for further information on how SeaSketch was used during the Forum process.

CONSULTATION DOCUMENT AND SUBMISSIONS

In October 2016, the Forum released its Consultation Document detailing the 20 proposed sites on which it was seeking feedback. The Forum received 2803 submissions by the time consultation closed in December 2016.⁵⁶

Of the 2803 submissions, 1964 were pro forma. For further details, refer Appendix 4. Further site-by-site details on the number of submissions for and against each of the 20 proposed sites are provided in section 2.4 under “What submitters said”.

1.4.4 Deliberations and decision making

In its final deliberations, the Forum reviewed all of the information it held for the 20 sites, including details from submissions and additional fisheries information provided by MPI.

The Forum also took into consideration other sites that were proposed in the submissions and suggested boundary amendments. Some sites were eliminated from further consideration at this stage, while others were amended and some remained unchanged.

While the Forum as a whole was unable to reach consensus,⁵⁷ agreement was reached on two alternative networks for recommendation. These networks are set out in sections 2.2 and 2.3.

⁵⁶ For further details on consultation and submissions, see Appendices A3 and A4.

⁵⁷ See Section 5 – ‘Universal issues’.

2.

RECOMMENDATIONS



Northern Royal Albatross, Tairaroa Head.
Photo: John Barkla

2.1 INTRODUCTION

The Forum was unable to reach consensus on a single network in making its recommendations and so has instead agreed on two alternative networks (Figure 2-1). The unresolved differences between Forum members included different interpretations of how to apply the MPA Policy and the extent to which the requirements set out in the Ministers' Terms of Reference to the Forum should be achieved. The Terms of Reference required:

MPA Targets and Considerations

The Forum's recommendations should aim to achieve the MPA Policy objective at a "Forum region" level – that is to: "protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of [Otago's] marine habitats and ecosystems".

The Forum should give consideration to the Biodiversity Strategy (2000), and the Convention on Biological Diversity and its objectives of establishing ecologically representative and well connected systems of Marine Protected Areas.

In keeping with the MPA Policy, the Forum should focus on recommending a mix of protection tools (including Marine Reserves) to provide coverage of a representative range of habitats and ecosystems, while recognising that the role of the Forum is to implement the MPA Policy at the sub-bio regional scale. The Forum should focus on outcomes and select the best tool available to achieve the objectives of the Forum.⁵⁸

The touchstone for whether or not the networks achieve the requirements set out in the Terms of Reference and objective of the MPA Policy is whether or not there is protection of a range of habitats that are 'representative' of those habitats and ecosystems that are present in the Forum region, i.e. whether the full range of ecosystems, including the biotic and habitat diversity of the region, is present in the network.

In terms of management, both networks support the recommendation for a generational review and co-management for Kāi Tahu, which is explained in detail in Section 3. Other key management recommendations that are in common are in respect of permitting the removal of kōiwi tākata and cultural materials, specifically allowing for transit through Marine Reserves, and prohibiting seismic testing and bottom disturbance.

The two networks differ in the extent to which the above objectives are achieved. Network 1 comes closest, achieving the requirements set out in the Terms of Reference in a manner consistent with the objectives of the MPA policy. By contrast, Network 2 places more weight on having the least impact (in terms of displacement) on commercial and recreational fishing. Network 2 proponents assessed the extent of protection in a cumulative sense alongside existing fisheries restrictions that do not themselves meet the requisite protection standard in the MPA. Consequently, Network 2 does not fulfil some of the requirements set out in the Terms of Reference nor fully meet the MPA Policy objective in respect of network design.

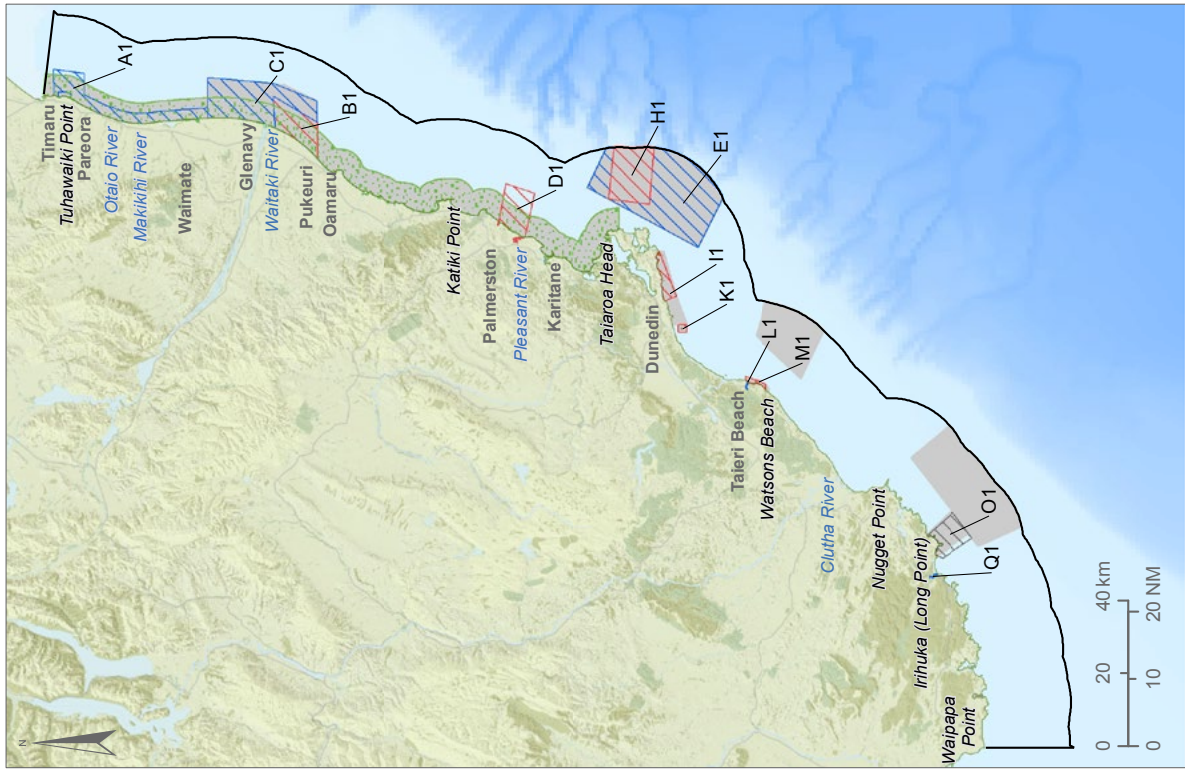
Kāi Tahu do not oppose the proposed MPAs, but the rūnaka acknowledge that there will be an impact on customary values / access.

⁵⁸ See Appendix A3.3 for the Forum's Terms of Reference.

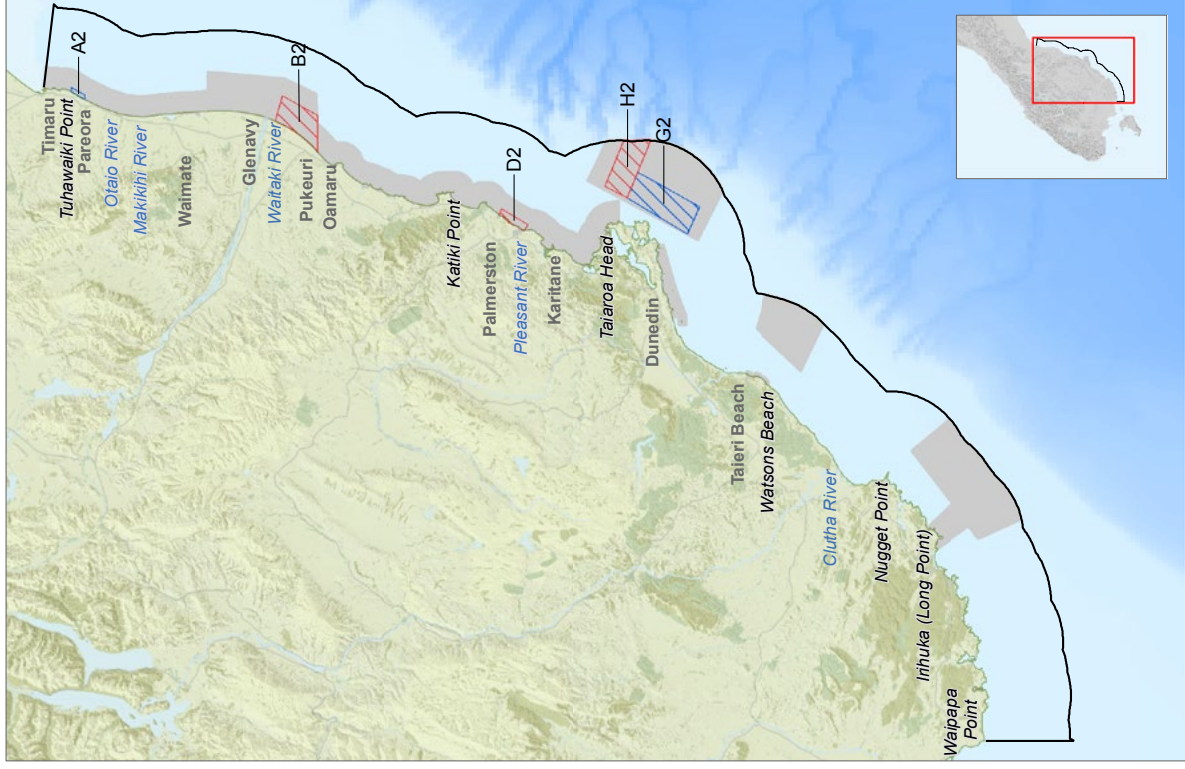
Figure 2-1: Network Overview

The sites that have been recommended for inclusion in Network 1 and Network 2. The areas that were originally consulted on are also shown in grey.







Network 1



Network 2



Management areas

-  Marine Reserve
-  Type 2 MPA
-  Unconfirmed site
-  Consultation area
-  Site T1 - Kelp forest
-  Forum region

Network 1 is supported by the environment, tourism, community and science sectors, as well as one of the two recreational fishing representatives. The proposed MPAs in Network 1 are not opposed by Kāi Tahu, with the exception of Site O1 - Irahuka (Long Point). Consequently Site O1 - Irihuka (Long Point) is not included in the subsequent Network 1 analysis.

Network 2 is supported by the commercial fishing representatives and one of the two recreational fishing representatives. None of the proposed MPAs in Network 2 are opposed by Kāi Tahu.

Site identifiers

In the Consultation Document, each site was given a letter from A to T as an identifier and the use of these letters has continued in this report. In most cases, the boundaries of the sites have changed from what was consulted on and differ between networks for those sites that are included in both. To identify which network a site belongs to, the numeral 1 or 2 has been added after the site letter, i.e. Site A1 refers to Site A Network 1, Site A2 refers to Site A Network 2 and so forth.

2.1.1 Network comparison

Table 2-1: Summary of the key attributes of each network

Network	% of Forum region	Size (km ²)	No. of Marine Reserves	No. of Type 2 MPAs	No. of habitats (of 37) ⁵⁹	Estimated export value of potentially displaced fishery (\$)
Network 1	14.2	1,267	6*	5	27	3.6 million
Network 2	4.1	366	3	2	12	1.2 million

* This number does not include Site O1 - Irihuka (Long Point).

Although the proposed protection and boundaries of the two networks differ (see Table 2-1), they have several sites in common (see Figure 2-1):

- Both propose a Type 2 MPA bordering the existing Tuhawaiki Mātaaitai Reserve, on the coast just south of Timaru. However, the Type 2 MPA in Network 1 (Site A1) extends beyond the boundaries of that proposed in Network 2 (Site A2) both coastward and south along the coast. Site A1 is larger than Site A2 and also goes beyond the boundary of the site as consulted on.
- Each network includes a Marine Reserve proposal for the coastal area just south of the Waitaki River mouth, with only minor boundary differences (Sites B1 and B2).
- Each network includes a Marine Reserve at Te Umu Koau (Bobby's Head),⁶⁰ south of Matakaea (Shag Point). The Marine Reserve in Network 1 (Site D1) includes the Pleasant River and Stony Creek Estuaries, which are not part of Network 2 and would extend offshore significantly beyond the boundary of the Marine Reserve proposed

⁵⁹ Includes coastal and estuarine broad-scale habitats, and biogenic habitats.

⁶⁰ Te Umu Koau is the Māori name for Bobby's Head – please refer to the proposed Māori name in Section 4.4 for Sites D1 and D2, which was proposed in accordance with the Treaty partner.

for Network 2 (Site D2). Site D1 is larger than Site D2 and a portion of it goes beyond the boundary of the site as consulted on.

- Each network includes pairs of MPAs offshore from the Otago Peninsula – a Marine Reserve to protect the Papanui Canyon (Sites H1 and H2) and a Type 2 MPA to protect the nearby bryozoan beds. The Type 2 MPA included in Network 1 (Site E1) is more extensive than that in Network 2 (Site G2) and has additional restrictions. Site H1 also includes the plateau habitat between Papanui and Saunders Canyons.

Network 2 does not include any additional sites beyond those described above. However, in Network 1, there are three additional Marine Reserves and four additional Type 2 MPAs, as well as protection for giant bladder kelp at Site T1. These are:

- A Type 2 MPA (Site C1) bordering the proposed Marine Reserve at Site B1 near the Waitaki River, and extending coastward and northward, which the proponents of Network 1 consider would complement the Marine Reserve.
- A Marine Reserve on the south coast of the Otago Peninsula, bordering many of the Dunedin City beaches (Site I1).
- A Marine Reserve surrounding Okaihae (Green Island), one of the larger islands in the Forum region (Site K1).
- A Type 2 MPA over the Akatorea Estuary (Site L1).
- A Marine Reserve on the coast at Akatore, extending south of Hākinikini (Quoin Point) (Site M1), which, together with Site L1, could protect a range of estuarine to subtidal habitats.
- A Type 2 MPA over the Tahakopa Estuary (Site Q1), to the south of Irihuka (Long Point).
- An ‘Other’ protection tool between Timaru and the Otago Peninsula where the commercial harvesting of giant bladder kelp (a biogenic habitat) would be prohibited (Site T1).

In including these sites, particularly those south of the Otago Peninsula, Network 1 includes a range of the regional variation in habitat types that are found in the Forum region, as required by the MPA Policy.⁶¹

To better provide for regional representation, the proponents of Network 1 include information about a Marine Reserve proposal for Irihuka (Long Point; Site O1). However, this is opposed by Kāi Tahu representatives and so is not included in the formal analysis of Network 1. Site T1 (kelp forest) does not protect sufficient biodiversity to meet the protection standard and so is also not included in the network analysis for Network 1.

While the Network 2 proponents assessed Network 2 alongside existing fishing restrictions, such as mātaītai reserves and the 4 NM set net ban, those fishing restrictions do not meet the MPA protection standard,⁶² they are not included in the network analysis of this introduction.

⁶¹ MPA Guidelines, p. 20.

⁶² Breen, D. 2011: Coastal marine habitats and marine protected areas in the New Zealand Territorial Sea: a broad scale gap analysis. Department of Conservation and the Ministry of Fisheries, Wellington. p. 17 and 36.

2.1.2 Summary of Network 1

Network 1 proponents aimed to achieve a network that protects each habitat type (i.e. one that is representative) in a viable Marine Reserve, with replication in another MPA (Marine Reserve or Type 2), as well as ensure connectivity between MPAs in the network, to the extent practicable. Network 1 protects many of the Forum region's iconic marine habitats, species and ecosystem, with emphasis on those that are rare, distinctive and nationally or internationally important. The proponents of Network 1 consider that a network must contain sufficient percentage coverage of each habitat type found in the region, to maximise the representation of biodiversity associated with the habitat types, and ensure the viability of the network as a whole is consistent with Network Design Principle 3.⁶³

Network 1 proponents are also able to identify potential scientific, educational and tourism benefits from their network.

Network 1 (excluding Site O1):

- Covers 14.2% (1267 km²) of the Forum region, including:
 - Six Marine Reserves (4.5% or 404 km² of the Forum region)
 - Five Type 2 MPAs (9.7% or 862 km² of the Forum region).
- Protects kelp forest habitat in Site T1 (although this is not included in the analysis as it does not meet the protection standard).
- Includes:
 - 18 of the 22 coastal habitats found within the Forum region,⁶⁴ among which:
 - All 18 are present in a Marine Reserve
 - 12 are replicated in at least one other MPA, three of which probably do not meet the protection standard⁶⁵
 - Seven of the 12 estuarine habitats found within the region, among which:
 - Five are present in a Marine Reserve
 - Four are replicated in at least one other MPA
 - Two are present only in Type 2 MPAs
 - Two biogenic habitats,⁶⁶ including:
 - Bryozoan thickets (Sites E1 and H1)
 - *Macrocystis* kelp forest (Site D1).
- Is supported by six members of the Forum, including representatives of the community, the environmental, science and tourism sectors, and one of the two recreational representatives.

⁶³ MPA Policy, p 16.

⁶⁴ Four sheltered habitat types all occur in an area that is affected by consented dredge spoil dumping. The Forum has not included these in its recommendations due to concerns about the effects of this activity on the viability of any MPA.

⁶⁵ This is because either the amount of habitat in question is insufficient or the level of protection is insufficient. To be considered to be represented, the size and quality of a habitat must also be sufficient to be viable. Considering both the size and the protection level, Network 1 proponents consider that the rocky reef habitats in Type 2 MPAs do not meet the protection standard in a viable manner.

⁶⁶ Seagrass, the third biogenic habitat in the Forum region, occurs extensively within Otago Harbour, including within the Ōtākou Mātaītai, but is only present in small patches in Network 1.

- Potentially displaces fisheries with an annual estimated export value of \$3.6 million out of a total of \$34.4 million for the Forum region.⁶⁷

Network 1 is larger than Network 2 and protects a wider representation of habitat types (both in accordance with the broad-scale habitat classification and in terms of representation of the relevant regional variation). Network 1 includes higher levels of protection in its Type 2 MPAs than Network 2 and generally favours biodiversity protection, though its proponents have made concessions to minimise impacts on Kāi Tahu and existing users. Network 1 includes some proposals that are larger than those consulted on publicly.

2.1.3 Summary of Network 2

The proponents of Network 2 designed their network to protect nationally significant biogenic habitats within Marine Reserves, combined with Type 2 MPAs that protect important recruitment areas and juvenile habitats.

The proponents of Network 2 consider that fishing methods with lower environmental impacts can continue to be used while still meeting broader biodiversity objectives. They have included sites that could benefit fisheries through the protection of important recruitment and juvenile fishing grounds for mako repe (elephant fish), tarakihi and mako (school shark).

Network 2:

- Covers 4.1% (366 km²) of the Forum region, including:
 - Three Marine Reserves (2.35% or 210 km² of the Forum region)
 - Two Type 2 MPAs (1.75% or 156 km² of the Forum region).
- Includes:
 - Ten of the 22 coastal habitats found within the Forum region, among which:
 - Ten are present in a Marine Reserve
 - Six are replicated in at least one other MPA
 - No estuarine habitats
 - Two biogenic habitats, including:
 - Bryozoan thickets (Sites G2 and H2)
 - *Macrocystis* kelp forest (Site D2).
- Is supported by four members of the Forum, including all three commercial fishing representatives and one of two recreational fishing representatives.
- Potentially displaces fisheries with an estimated export value of \$1.2 million out of a total of \$34.4 million for the Forum region.

The proponents of Network 2 have placed more emphasis on minimising impacts on existing users than those of Network 1. Network 2 is smaller than Network 1, with protection tools in the proposed Type 2 MPAs generally being the minimum required under the MPA Policy. Consequently, the effect of displacement of commercial and recreational fishers is significantly less than in Network 1.

⁶⁷ Estimates provided by MPI, based on 2016 export prices. These figures do not represent a full economic assessment but rather are provided as indicators of the relative impacts of the networks and sites. See Appendix A1.2 for details about the limitations of these estimates.

All the sites in Network 2 have the same boundaries and tools as were consulted on, apart from Site D2 that no longer includes the estuaries.

2.1.4 Representation and replication

Table 2-2 shows the extent to which each network achieves protection and replication of the habitat types in the Forum region. Network 1 largely gives effect to the MPA Policy requirements for habitat types that have an area of sufficient size that it is viable to protect, with the exception of sheltered shallow reef and sheltered shallow sand. By contrast, Network 2 does not give effect to the MPA Policy requirements for protection and replication of the habitat types within the region, with several coastal and all estuarine habitat types receiving no protection through the establishment of an MPA that meets the protection standard.

For Network 1, each habitat has been considered in terms of the likelihood of there being regional variation that is not accounted for in the national habitat classification methodology.⁶⁸ In particular, the importance of regional modifiers to the classification process that result in a higher likelihood that the classification does not represent the patterns of biodiversity of the Forum region were considered. These modifiers include the Southland Current; the proximity of the canyons to the mainland; and the coastal geomorphology, including the Otago Peninsula. The Marine Reserves included in Network 1 include from 2% of the regional extent (deep mud) to over 81% of the regional extent (exposed intertidal reef).

For Network 2, each habitat has also been considered in terms of the likelihood of there being regional variation that is not accounted for in the national habitat classification methodology. The Marine Reserves included in Network 2 include from 2.7% of the regional extent (deep gravel) to 16.6% of the regional extent (deep water sand).

2.1.5 Viability

Viability, and whether an MPA meets the protection standard, relates to the overall size of the MPA and how boundaries are placed in regard to habitats. For example, a small reserve such as Site K1, Okaihae (Green Island), may be effective if the reef is entirely included in the MPA along with a buffer, but will be less so if the reef is bisected by the boundary (anecdotal reports suggest that the reef may extend beyond the boundary but this has not been verified).

Three of the ten coastal MPAs in Network 1 are less than 5 km in width, while three are greater than 10 km. Questions remain as to the viability and adequacy of protection for the three narrower sites (Sites A1, K1 and M1).

All five of the coastal MPAs in Network 2 are less than 10 km in width, with two being less than 5 km. It is highly improbable that Site A2 will meet the protection standard in any ecologically meaningful way mainly due to its small size. In addition, the seaward boundary of Site D2 crosses sections of the reef at the outer edge of the kelp forest. The narrowness and lack of buffer associated with this site makes it unlikely that it will align with part (b) of the protection standard⁶⁹, and therefore it is unlikely to represent the subtidal reef communities in an ecologically intact manner; however, it will protect the important kelp forest habitat.

⁶⁸ Science Submission 2683.

⁶⁹ See Appendix 2, Section A2.3.

Table 2-2: Habitat comparison between Network 1 and Network 2

This table provides an overview of the percentage of each broad-scale and biogenic habitat type that is included in each of the two networks (representation), and the level of replication for each habitat in both Marine Reserves and Type 2 Marine Protected Areas. It is an MPA Policy requirement to represent each habitat type in a Marine Reserve and at least one other MPA. Therefore, habitat replication is shown in green where the requirements are met, yellow when the requirements are partially met (included in a Marine Reserve but not replicated) and red when the requirements are not met. Asterisks (*) indicate habitat types that the network proponents consider unviable due to the size and protection type of the MPA. Note that there may be other habitats included in the table that are not viable and so each habitat requires further assessment.

Habitat	Total habitat in region (km ²)	Representation (%)		Replication (#)			
		Network 1	Network 2	Network 1		Network 2	
		Marine Reserves & Type 2 MPA	Marine Reserves & Type 2 MPA	Marine Reserve	Type 2 MPA	Marine Reserve	Type 2 MPA
Deep Gravel	1102.2	7.8	2.7	3	2	1	1
Deep Mud	128.2	7.4	0	1	0	0	0
Deep Reef	163.4	4.7*	0	1	1*	0	0
Deep Sand	4785.8	10.9	4.4	4	1	1	1
Deep Water Sand	73.1	97.1	24.7	1	1	1	0
Exposed Boulder Beach	0.0	80.3	0	1	0	0	0
Exposed Intertidal Reef	7.2	15.0	0	3	0	0	0
Exposed Sandy Beach	6.3	9.6	0	2	0	0	0
Exposed Shallow Gravel	6.5	20.6	0	1	1	0	0
Exposed Shallow Reef	90.9	5.8	0	3	0	0	0
Exposed Shallow Sand	547.1	4.2	0	3	0	0	0
Moderate Gravel Beach	3.2	91.0	17.0	1	2	1	1
Moderate Intertidal Reef	5.2	3.8*	3.6	1	1*	1	0
Moderate Sandy Beach	6.4	3.2	3.2	1	0	1	0
Moderate Shallow Gravel	901.8	35.0	8.3	1	2	1	1
Moderate Shallow Mud	132.9	66.2	10.2	2	2	1	0
Moderate Shallow Reef	116.8	27.1*	13.1	1	1*	1	1
Moderate Shallow Sand	768.3	12.6	0.5	1	2	1	1
Sheltered Intertidal Reef	0.4	0	0	0	0	0	0
Sheltered Sandy Beach	1.0	0	0	0	0	0	0
Sheltered Shallow Reef	4.5	0	0	0	0	0	0
Sheltered Shallow Sand	25.9	0	0	0	0	0	0
Estuarine	9.0	6.5	0	1	2	0	0
Estuarine Boulder Beach	0.0	0	0	0	0	0	0
Estuarine Boulder Reef	0.0	0	0	0	0	0	0
Estuarine Cobble Beach	0.1	0	0	0	0	0	0
Estuarine Cobble Field	0.0	0	0	0	0	0	0
Estuarine Gravel Beach	0.3	0.6	0	0	1	0	0
Estuarine Gravel Field	0.4	0.7	0	0	1	0	0
Estuarine Intertidal Reef	0.8	0.3	0	1	0	0	0
Estuarine Mud Flat	42.6	2.8	0	1	2	0	0
Estuarine Reef	0.2	0	0	0	0	0	0
Estuarine Sand Flat	20.7	0.3	0	1	2	0	0
Estuarine Sandy Beach	16.4	1.8	0.0	2	2	0	0
Biogenic - <i>Macrocystis</i>	18.0	32.8	32.2	1	0	1	0
Biogenic - Bryozoan Habitat	431.0	94.0	49.4	1	1	1	1
Biogenic - Seagrass	7.2	0	0	0	0	0	0

2.1.6 Connectivity

Connectivity is difficult to measure and so only a basic assessment is possible.

For Network 1, the average distance between MPAs is 88.6 km. Subtidal rocky reef habitats appear to be largely connected across the Forum region at the 50–100 km level (excluding the influence of the Southland Current).

For Network 2, the average distance between MPAs is 73.9 km. Subtidal rocky reef habitats appear to be poorly connected across the Forum region at the 50–100 km level (excluding the influence of the Southland Current). The absence of any reef examples south of Taiaroa Head, and the questions around the viability of the northern example at Site A2 and the likely efficacy of Site D2 with the boundary crossing the reef along its entire length were considered.

2.1.7 Potential impacts to existing users

The relative potential effects of each network on commercial fishing are shown in Table 2-3. Fishery displacement is defined as the percentage of the catch for that fishery that was presumed to have been caught within the network area (2007–2015). It does not demonstrate an actual impact on the fishery, as multiple factors would need to be taken into account to calculate this (e.g. the movement of target species).

Table 2-3: Commercial fishery displacement in each network area

Displacement relates to the amount of effort/catch that has occurred at the sites within each network during the fishing years 2007/08 to 2014/15 that would be displaced by the proposals. Percentages represent the proportion of displacement based on the Forum region (as opposed to the Quota Management Area).

Fishery	Network 1			Network 2		
	(%)	kg	\$	(%)	kg	\$
Danish seine	16.2	20,640	81,515	1.8	1,755	7,054
Dive - Pāua	0.5	232	5,459	0.5	205	4,841
Jig - Squid	3.8	9,446	29,188	2.1	5,396	16,675
Line (bottom longline and dahn line)	9.2	2,498	21,924	2.8	1,312	11,837
Net - Elephant Fish	2	238	1,407	0	15	81
Net - Rig	7	2,649	13,441	1.4	1,410	7,057
Net - School shark	15.6	1,515	7,427	0.8	641	2,953
Net - Other	7.8	3,694	22,662	1.1	791	3,424
Pot - Blue cod	10.7	8,832	112,734	1.6	2,998	35,543
Pot - Rock lobster	18.5	24,158	2,632,833	5.8	9,772	1,067,947
Trawl - Flatfish	2.4	4,711	28,039	0.2	1,402	7,543
Trawl - Gurnard	13	2,354	12,536	0.9	1,426	7,816
Trawl - Red cod	6	727	2,868	0.4	1,246	3,569
Trawl - Tarakihi	2.1	1,377	6,779	0.5	676	3,037
Trawl - Other	5.8	11,094	47,388	0.4	5,244	23,401

2.2 NETWORK 1

2.2.1 Network overview

Network 1 has six Marine Reserves and five Type 2 MPAs (refer to Table 2-4 and Figure 2-2). The total area contained within this proposed network accounts for 14.2% of the south-east marine area, 4.5% of which would be in Marine Reserves.

The proponents of Network 1 seek to maximise the habitat, ecosystem and biodiversity benefits that arise from an effective MPA network, while minimising effects on existing users and other impacts. Every effort has been made to be consistent with the MPA Policy while allowing for the views provided from the region's communities. Much thought, discussion and compromise have shaped this network, and each proposed site that makes up the network has been designed with a clear purpose.

Network 1 is supported by the representatives of the community, environmental, science and tourism sectors, as well as one of the two recreational fishing representatives. In addition, none of the proposed MPAs are opposed by Kāi Tahu, with the exception of Site O1 – Irihuka (Long Point), which is opposed by one rūnaka. The Kāi Tahu position is determined by their individual papatipu rūnaka, who do not hold a uniform position on their respective areas. Therefore, it cannot be assumed that Kāi Tahu hold a single position in support of or opposition to any MPA.

In addition to the two types of MPAs that are included in Network 1, an additional protection tool has been proposed to safeguard a key biogenic habitat and the associated ecosystem ('Kelp Forest'⁷⁰). While this 'other marine protection tool'⁷¹ does not meet the protection standard and is therefore not included in the analysis of the network, it does contribute to the network outcome (refer to Section 2.4.14).

Consensus was not reached for Site O1 – Irihuka (Long Point) Marine Reserve, and therefore it has been excluded from the core analysis of Network 1. Had Site O1 – Irihuka (Long Point) been included in the analysis above and throughout this report, Network 1 would have had seven marine reserves and covered a greater area and range of habitats. This proposed site was opposed by Kāi Tahu but supported by the other proponents of Network 1 as the proponents consider Site O1 – Irihuka (Long Point) is needed for a more complete network and to include representation of southern habitats. Information on the concerns of manawhenua and the Kāi Tahu position, and the reasons for including a Marine Reserve at Site O1 – Irihuka (Long Point) as part of the network is provided in the site-by-site summary (refer to Section 2.4.12).

Network 1 represents a culmination of 3 years of co-development between Kāi Tahu, the stakeholder sectors and the community at large. Forum members have travelled around the region; listened and learnt from many meetings, hui, workshops and stakeholder discussions; and finally been guided by 2803 submissions. The process has shown that the community is strongly connected to the local marine environment. Forum members in support of Network 1 believe that there is widespread community support for better protection of the marine environment and its biodiversity. Network 1 has been designed to play a part in restoring and sustaining the marine ecosystems of the south-east region for future generations.

⁷⁰ The kelp site is expected to fall under special legislation and is not assessed as part of the MPA network. The Kelp Forest proposal provides key protection for a major biogenic habitat and an 'ecosystem engineer' species with significant biodiversity values.

⁷¹ See the MPA Guidelines, section 2.8 ('Other protection tools').

The proponents of Network 1 reached consensus with Kāi Tahu on a range of sites, based on locations set out in the consultation stage.

Table 2-4: Network 1 sites

The names and protection tools of Network 1 sites, and how each relates to what was consulted on.

Site name	MPA type	Relationship to consultation
A1 – Tuhawaiki	Type 2	Site A – extended offshore and south
B1 – Waitaki South	Marine Reserve	Site B – minor boundary changes
C1 – Waitaki North	Type 2	Site C – minor boundary changes
D1 – Pleasant River to Stony Creek	Marine Reserve	Site D – extended offshore
E1 – Saunders Canyon & Surrounds	Type 2	Site E – as per consultation
H1 – Papanui Canyon	Marine Reserve	Site H – extended
I1 – Harakeke Point to White Island	Marine Reserve	Site I – as per consultation Option 1
K1 – Okaihae (Green Island)	Marine Reserve	Site K – as per consultation
L1 – Akatorea Estuary	Type 2	Site L – as per consultation
M1 – Akatore Coastal	Marine Reserve	Site M – minor boundary changes
Q1 – Takahopa Estuary	Type 2	Site Q – changes to boundary and protection type
T1 – Kelp Forest	Other	Site T – as per consultation
<i>O1 – Irihuka (Long Point) *</i>	<i>Marine Reserve – no consensus</i>	<i>Site O – boundary changes</i>

* Site O1 is shown in italics as it is not formally included in the network. See Section 2.4.12

2.2.2 Key network outcomes

Network 1 provides protection for many of the iconic marine habitats, species and ecosystems that are found in the Forum region, with an emphasis on those that are rare, distinctive and nationally or internationally important. This network has been designed to achieve marine conservation and responds to the voice of many in the community who are calling for better management of the local marine environment.

Network 1 highlights include the protection of internationally important and unique habitats and wildlife off the Otago Peninsula, including key bryozoan reefs, little-studied deep-water canyon habitats, and habitats for significant seabird and mammal species. Network 1 is also intended to protect the biodiversity of gravel beaches and subtidal cobble fields near the Waitaki River mouth, the habitat-forming kelp forests of North Otago, sea caves and deep-water reefs at Te Umu Koau (Bobby’s Head) / Tavora, and estuaries connected to the sea. A city Marine Reserve that takes in the beaches of Dunedin will build the profile of local marine ecosystems and open a natural classroom on the front door of the region’s largest city. To the south, another key Marine Reserve at Site K1, Okaihae (Green Island), will protect the waters surrounding one of the largest islands in the region.

The inclusion of Site T1 specifically relates to protecting the kelp forests of coastal Otago from commercial harvest. Kelp forests form the base of complex food webs that provide for both coastal and pelagic species, including numerous commercially harvested fish and invertebrate species. Giant bladder kelp is recognised as both an ‘ecosystem engineer’, making it critical to the health of the ecosystem, and a species that forms a biogenic habitat (i.e. kelp forest). See the site-by-site descriptions in Section 2.4 for details.



Figure 2-2: Location of the 11 proposed Marine Protected Area (MPA) sites in Network 1

Marine Reserves are shown in red, Type 2 MPAs are shown in blue, the Kelp Forest protection tool is shown in green and the unconfirmed site at Site O1, Irihuka (Long Point), is shown in grey. Note: The Site O1, Irihuka (Long Point), Marine Reserve proposal is not consented to by Kāi Tahu (see Section 2.4.12).

There is still much to learn about marine ecosystems in this region. The MPAs that have been recommended in Network 1 will enable the fostering of locally-focused marine research and will support education and tourism opportunities. The network will provide the keystone for a broader and more effective management strategy for the south-east marine environment that can begin to rebuild the local marine environment and ecosystem. This will hopefully provide a turning of the tide for marine biodiversity protection in the region, and benefit present and future generations.

2.2.3 Contribution to the MPA Policy objective

The objective of the MPA Policy is to ‘Protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of New Zealand’s marine habitats and ecosystems’. How well the network achieves this objective is determined by evaluating:

- Representation: How well the MPAs adequately represent the biodiversity of the region
- Replication: How many MPAs contain a particular habitat type, allowing for resilience to disturbance
- Connectivity: How connected MPAs are to each other
- Viability: The size and quality of each MPA and whether this allows it to meet the MPA Policy objective.

2.2.3.1 REPRESENTATION

Habitat representation is a primary consideration under the MPA Policy (i.e. to ‘protect the full range of marine habitats and ecosystems’) and the MPA Policy principles (Network Design Principle 1 and Planning Principle 1⁷²). As such, sites within the network should be representative of one or more habitats or ecosystems. In addition, the overall network should be representative of all marine habitats, as well as including a minimum of one example of each habitat type within a Marine Reserve (Planning Principle 5). The extent of each habitat type in the entirety of Network 1 is assessed in Figure 2-3 and Table 2-5.

Broad-scale habitats

Of the 22 broad-scale coastal habitats that were identified by the MPA Policy classification, ten are represented at values of greater than 10% of the habitat within the region, four are represented at 5–10% and four are represented at less than 5% in Network 1 (within both Marine Reserves and Type 2 MPAs). With respect to Marine Reserves, only six habitats are represented at more than 10%, four are represented at 5–10% and eight are represented at less than 5% (Table 2-5).

Four habitat types (sheltered habitats) are absent from Network 1. These habitats all occur to the north-west of the Otago Harbour entrance, between the East Otago Taiāpure and Heyward Point. Concern regarding the viability of these sites due to the effects of consented dredge spoil dumping meant that they were not put forward as part of Network 1. It is also noted that the taiāpure includes these habitat types but is not considered an MPA.

⁷² Network Design Principle 1 states that ‘The MPA network will protect examples of the full range of natural marine habitats and ecosystems’. Planning Principle 1 states that ‘Every MPA should be designated on the basis that it is representative ...’.

Estuaries appear to not be well represented within Network 1 based on the habitat classification, with only 7 of the 12 estuarine habitats included – this accounts for less than 2.3% across all estuarine habitats. However, rather than focusing on the habitat classification to drive representation within estuaries, the proponents of Network 1 considered a pragmatic approach that included identifying entire estuaries for protection rather than focusing on particular habitats within multiple estuaries. Utilising this approach, 2 of the 30 identified estuaries within the Forum region are included within a Marine Reserve in Network 1 (Pleasant River and Stony Creek) and a further two are in Type 2 MPAs (Akatore and Tahakopa).

Guidance under the MPA Policy states that it is desirable for sites to be prioritised on the basis that they are representative of one or more habitats or ecosystems. Each site proposed in Network 1 includes habitats that are consistent with this approach. The site-by-site descriptions in Section 2.4 provide details on the habitat representation, but the key features of each site are as follows:

- Site A1: Representative of the soft-sediment habitats in the north of the region.
- Sites B1 and C1: Representative of the soft-sediment habitats (including cobble and gravel) of the Waitaki area, including some deeper habitat at Site C1 (>30 m depth).
- Site D1: Representative of shallow and deep reef habitats, and soft-sediment habitats of north Otago. Note that this is the only site to represent mapped deep reef adjacent to the coastline,⁷³ and the only site that includes an estuary in a Marine Reserve. This site provides for ecological connectivity between estuaries, reef habitats and adjacent soft-sediment habitats. This is the only proposal that incorporates this amount of habitat diversity in one site (seven coastal habitats alongside estuarine environments). Note also that while Site A1 contains shallow reef, it is of such a small size and limited level of protection that it does not contribute to the representation of this habitat type.
- Sites E1 and H1: Representative of the deep (30–200 m depth) soft-sediment habitats and canyon habitats.
- Site I1: Representative of the shallow, exposed soft-sediment habitats and shallow, exposed reefs of the Otago Peninsula.
- Site K1: Representative of the shallow reef habitat associated with this offshore island.
- Sites L1 and Q1: Represents two estuaries across the southern part of the region with Type 2 protection. The estuaries are both distinct from each other and those estuaries that are protected at Site D1 (a Marine Reserve at Pleasant River and Stony Creek).
- Site M1: Representative of the exposed reefs of the Clutha region, which are distinct from the exposed reefs to the north or south.

Internationally and nationally important habitats

A number of habitats within the region would likely meet the definition of being ‘rare, distinctive or nationally or internationally important’. These include:

⁷³ There are anecdotal reports of deep reef off Okaihau (Green Island) and Papanui Canyon, but these have not been verified.

- Bryozoan thickets
- Chaetopteridae worm fields
- *Macrocystis* forest
- Rhodolith beds
- Seagrass beds
- Sponge gardens
- Bivalves (horse mussels, dog cockles, mussels)

However, only three of these have been mapped in any detail to allow systematic planning – bryozoan thickets⁷⁴, *Macrocystis* kelp forests and seagrass⁷⁵. Only bryozoans and *Macrocystis* are represented in Network 1 based on their mapped distribution. However, it is anticipated that small areas of seagrass are present in Pleasant River Estuary and therefore represented within the network.

Proponents of Network 1 recommend that any future information on the distribution of these habitats may require assessment under the baseline monitoring and review framework recommended in Section 3 (for example, the chaetopterid fields are recognised as important biogenic habitats, but it will be difficult to include them in MPA proposals until they have been mapped).

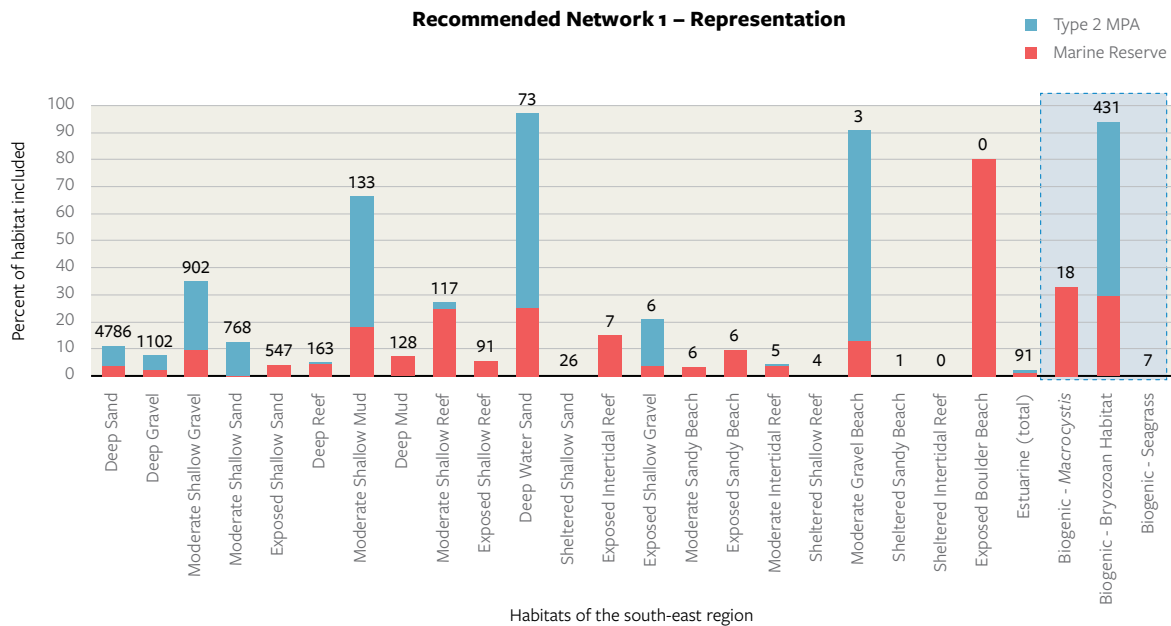


Figure 2-3: Network 1 representation

Representation is shown as the percentage of each habitat type within the Forum region that is covered by Marine Reserves and Type 2 Marine Protected Areas. The habitats are ranked from left to right in terms of overall area of habitat within the region (with area shown above the bar in km²), with the most extensive habitats to the left (habitats that cover less than 0.5 km² are shown as '0'). The 22 coastal habitats are shown on the left, while estuarine and biogenic habitats are shown on the right (biogenic habitats in the shaded area). Source: Department of Conservation and Ministry for Primary Industries.

⁷⁴ Wood, A. and Probert, K. 2003. "Bryozoan-dominated benthos of Otago shelf, New Zealand: its associated fauna, environmental setting and anthropogenic threats," J. R. Soc. New Zeal., vol. 43, no. 4. p. 231-249.

⁷⁵ Fyfe, J, Israel, S.A., Chong, A., Ismail, N., Hurd, C.L., and Probert, K. 1999. "Mapping Marine Habitats in Otago, Southern New Zealand," Geocarto Int., vol. 14, no. 3. p. 17-28.

Importance of regional variation

The national habitat classification does not satisfactorily incorporate regional variation within the Forum region. The Southland Current, proximity to canyons, differing geology and large river inputs all contribute to regional variation that is not accounted for in this classification, and evidence also suggests that there is considerable latitudinal and longitudinal (across shelf) variation within the Forum region.

The MPA Policy provides guidance for the Forum to consider and represent latitudinal and longitudinal variation. In recognition of this, Network 1 includes replication to give regard to adequately representing each habitat type across the region (see 'Replication' below). In some cases, however, habitats are not well represented across the region due to compromises being reached in consideration of existing users' interests.

An example of latitudinal variation that is of relevance to Network 1 is related to moderate shallow reef, which is represented in one Marine Reserve covering nearly 25% of the available habitat (Site D1). However, this only accounts for 3.3% of the habitat's overall latitudinal range (from Timaru to The Catlins). There is evidence of north-south regional differences within this habitat, with the Otago Peninsula marking a distinct change in community composition. Consequently, the proportion of habitat that is protected in that particular Marine Reserve is not representative of moderate reef habitats across the entire region (e.g. Network 1 represents the reef areas north of the Otago Peninsula well, but is less representative of that habitat type south of the peninsula). Compromises within Network 1 reflect a conscious effort to minimise effects on manawhenua and existing users, and have resulted in Network 1 not fully meeting this MPA Policy requirement.

To give a broad indication of the likely representation of regional variation within Network 1, the range of each broad-scale habitat type is given in Table 2-5 (column 'Region's latitudinal range').

2.2.3.2 REPLICATION

There are 22 broad-scale coastal habitats, 12 estuarine habitats and three biogenic habitats within the Forum region. The MPA Policy requires that a sample of each habitat type is protected within a Marine Reserve and replicated in at least one other Marine Reserve or Type 2 MPA. In order to be included in the network replication analysis, the habitat should be of sufficient size and quality to be viable, and be afforded sufficient protection to allow it to meet the protection standard. Figure 2-4 shows how well Network 1 meets the replication requirements.

Broad-scale habitats

Network 1 meets these minimum requirements of the MPA Policy for 12 coastal habitat types. In addition, a further three habitat types nominally meeting the requirements but the protection of these was not sufficient to meet the protection standard because they are small areas of reef habitat (deep reef, moderate intertidal reef and moderate shallow reef). The remaining habitats include three habitat types that are located in a Marine Reserve but are not replicated at another site (deep mud, exposed boulder beach and moderate sandy beach) and four that are not included in any protected area (all sheltered reef and beach habitats that only occur immediately northwest of the Otago Peninsula).

Internationally and nationally important habitats

Of the three biogenic habitats, bryozoan thickets are represented in both a Marine Reserve and an adjoining Type 2 MPA, while *Macrocystis* kelp forest is represented in one MPA (the Marine Reserve at Site D1), noting that the other site recommended for kelp forest protection (Site T) cannot be assessed as part of the network. Seagrass is not present within the network sites based on the mapping provided – although it is anticipated that small patches are present in the Pleasant River Estuary. Note that seagrass occurs extensively within Otago Harbour, including within the Ōtākou Mātaimai.

Figure 2-4: Network 1 replication

The minimum requirement under the Marine Protected Areas Policy and Implementation Plan (the MPA Policy) is for each habitat to be represented in a Marine Reserve with at least one further replicate in another MPA (either Marine Reserve or Type 2 MPA). Habitats that are present in Type 2 MPAs but do not contribute to the network (i.e. are not viable under the protection standard) are shown in grey.

Source: Department of Conservation and Ministry for Primary Industries.

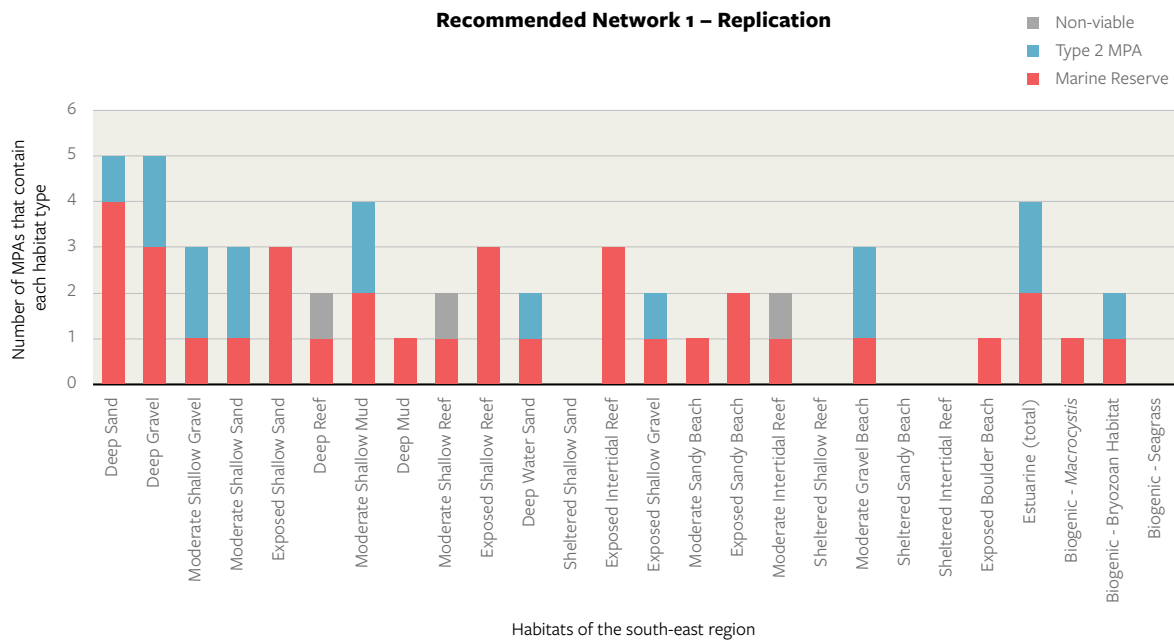


Table 2-5: Summary of habitat representation and replication in Network 1

This table summarises the percentage of each broad-scale and biogenic habitat type that is included in Network 1 (representation) and the level of replication for each habitat, both in Marine Reserves and Type 2 Marine Protected Areas. Since it is an MPA Policy requirement to represent each habitat type in a Marine Reserve and at least one other MPA, how well each habitat is replicated is shown as green where the requirements are met, yellow when the requirements are partially met (included in a Marine Reserve but not replicated) and red when the requirements are not met. Asterisks (*) indicate habitat types that the proponents of Network 1 consider unviable due to the size and protection type of the MPA. Note that other habitats that are included in the table may also be unviable and so each habitat requires further assessment.

Habitat	Total habitat in region (km ²)	Regions latitudinal range (km)	Representation (%)			Replication (#)		
			Marine Reserve	Type 2 MPA	Total in all MPAs	Marine Reserve	Type 2 MPA	Total in all MPAs
Deep Gravel	1102.15	263.79	2.0	5.8	7.8	3	2	5
Deep Mud	128.16	262.76	7.4	0.0	7.4	1	0	1
Deep Reef	163.44	248.43	4.5	*0.2	*4.7	1	*1	*2
Deep Sand	4785.77	281.02	3.7	7.3	10.9	4	1	5
Deep Water Sand	73.10	39.98	25.0	72.1	97.1	1	1	2
Exposed Boulder Beach	0.03	2.42	80.3	0.0	80.3	1	0	1
Exposed Intertidal Reef	7.21	97.12	15.0	0.0	15.0	3	0	3
Exposed Sandy Beach	6.34	95.84	9.6	0.0	9.6	2	0	2
Exposed Shallow Gravel	6.49	181.50	3.5	17.1	20.6	1	1	2
Exposed Shallow Reef	90.88	103.22	5.8	0.0	5.8	3	0	3
Exposed Shallow Sand	547.14	186.23	4.2	0.0	4.2	3	0	3
Moderate Gravel Beach	3.24	80.72	13.2	77.8	91.0	1	2	3
Moderate Intertidal Reef	5.23	231.55	3.6	*0.1	*3.8	1	*1	*2
Moderate Sandy Beach	6.43	154.65	3.2	0.0	3.2	1	0	1
Moderate Shallow Gravel	901.77	126.33	9.7	25.3	35.0	1	2	3
Moderate Shallow Mud	132.93	133.75	18.0	48.2	66.2	2	2	4
Moderate Shallow Reef	116.82	231.51	24.8	*2.3	*27.1	1	*1	*2
Moderate Shallow Sand	768.34	230.82	0.1	12.5	12.6	1	2	3
Sheltered Intertidal Reef	0.42	112.70	0.0	0.0	0.0	0	0	0
Sheltered Sandy Beach	1.02	108.09	0.0	0.0	0.0	0	0	0
Sheltered Shallow Reef	4.49	10.63	0.0	0.0	0.0	0	0	0
Sheltered Shallow Sand	25.88	111.53	0.0	0.0	0.0	0	0	0
Estuarine	9.04	227.11	3.3	3.2	6.5	1	2	3
Estuarine Boulder Beach	0.02	86.22	0.0	0.0	0.0	0	0	0
Estuarine Boulder Reef	0.00	147.23	0.0	0.0	0.0	0	0	0
Estuarine Cobble Beach	0.06	169.41	0.0	0.0	0.0	0	0	0
Estuarine Cobble Field	0.00	146.41	0.0	0.0	0.0	0	0	0
Estuarine Gravel Beach	0.33	223.62	0.0	0.6	0.6	0	1	1
Estuarine Gravel Field	0.43	176.30	0.0	0.7	0.7	0	1	1
Estuarine Intertidal Reef	0.82	169.77	0.3	0.0	0.3	1	0	1
Estuarine Mud Flat	42.59	169.25	1.6	1.2	2.8	1	2	3
Estuarine Reef	0.20	164.25	0.0	0.0	0.0	0	0	0
Estuarine Sand Flat	20.67	167.19	0.1	0.2	0.3	1	2	3
Estuarine Sandy Beach	16.43	170.03	1.0	0.7	1.8	2	2	4
Biogenic - <i>Macrocystis</i>	18.00	149.00	32.8	0.0	32.8	1	0	1
Biogenic - Bryozoan Habitat	431.00	47.00	29.9	64.0	94.0	1	1	2
Biogenic - Seagrass	7.20	148.00	0.0	0.0	0.0	0	0	0

2.2.3.3 CONNECTIVITY

Connectivity is difficult to measure and so only a basic assessment is possible using the best available information. The distances over which connectivity occurs among populations in coastal environments vary between species from a scale of several metres to thousands of kilometres. Populations of species that are relatively sedentary or sessile and have short-lived larval stages are more likely to be connected over shorter distances than more mobile species with long-lived larval stages. In addition, local and regional hydrodynamics (currents and waves) will also strongly influence connectivity. The Southland Current, which is the dominant oceanographic feature in the Forum region, flows through the region in a northward direction, strengthening connectivity through recruitment from the south to the north.

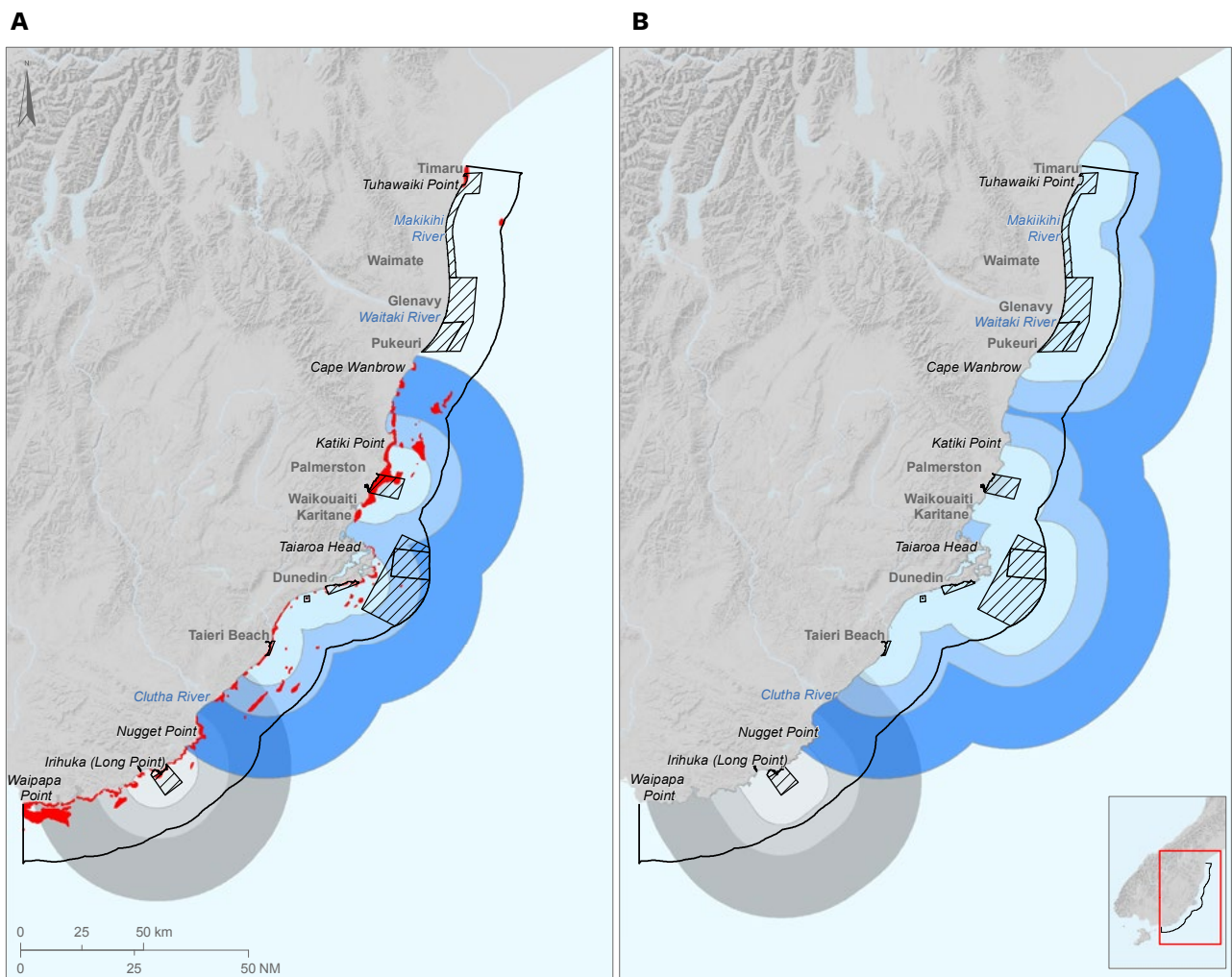











Figure 2-5: Network 1 connectivity

These maps show the potential for connectivity between (A) rocky reefs protected in Marine Reserves and (B) soft-sediment habitats protected in Marine Protected Areas (MPAs). The rocky reef map excludes Type 2 MPAs as it is considered that these make little contribution to the network for this habitat type as currently proposed, being better suited to the protection of soft-sediment habitats. The scale of connectivity between MPAs is shown at 25 km (light blue), 50 km (medium blue) and 100 km (dark blue). The contribution to connectivity of Site O1 is shown in grey for reference, as it is not considered part of Network 1.

-  Management areas
-  Subtidal reefs
-  Connectivity @ 25 km
-  Connectivity @ 50 km
-  Connectivity @ 100 km
-  Connectivity @ 25 km
-  Connectivity @ 50 km
-  Connectivity @ 100 km
-  Forum region

There appears to be reasonable connectivity over multiple scales for subtidal rocky reef habitats across the central part of the Forum region (Figure 2-5a) and subtidal soft-sediment habitats across the region north of The Catlins (Figure 2-5b).

The proponents of Network 1 consider that the network design provides a reasonable compromise across the different scales of connectivity, allowing for connectivity between the sites of many of the species that will be affected by restrictions on fishing activities. The sizes of the proposed MPAs also allow for connectivity between habitats within individual reserves (this is particularly important for species that do not widely disperse) and between different habitat types (e.g. Site D1 connects estuarine, 'shallow soft and hard' habitats, and 'deep soft and hard' habitats).

2.2.3.4 VIABILITY

All of the sites that have been proposed in Network 1 are designed with a clear purpose related to biodiversity protection. The two main considerations regarding viability are the size of the site and the level of protection afforded.

Size

A key component of viability is the size of the protected area (see Table 2-6 for the widths of each MPA).⁷⁶

Five of the proposed sites in Network 1 are relatively small (less than 5 km in width), but the viability requirements are likely to be met due to the presence of natural buffers (e.g. sand around a reef), entire habitats being protected or their occurrence in naturally restricted areas (e.g. estuaries). For example, a smaller reserve such as Okaihae (Green Island) is considered to be effective because it entirely encompasses the reef habitat (Figure 2-6), creating a buffer around the island. However, our knowledge of the actual reef extent for this site is limited. If the reef actually extends beyond the proposed boundary, leading to the reef habitat being

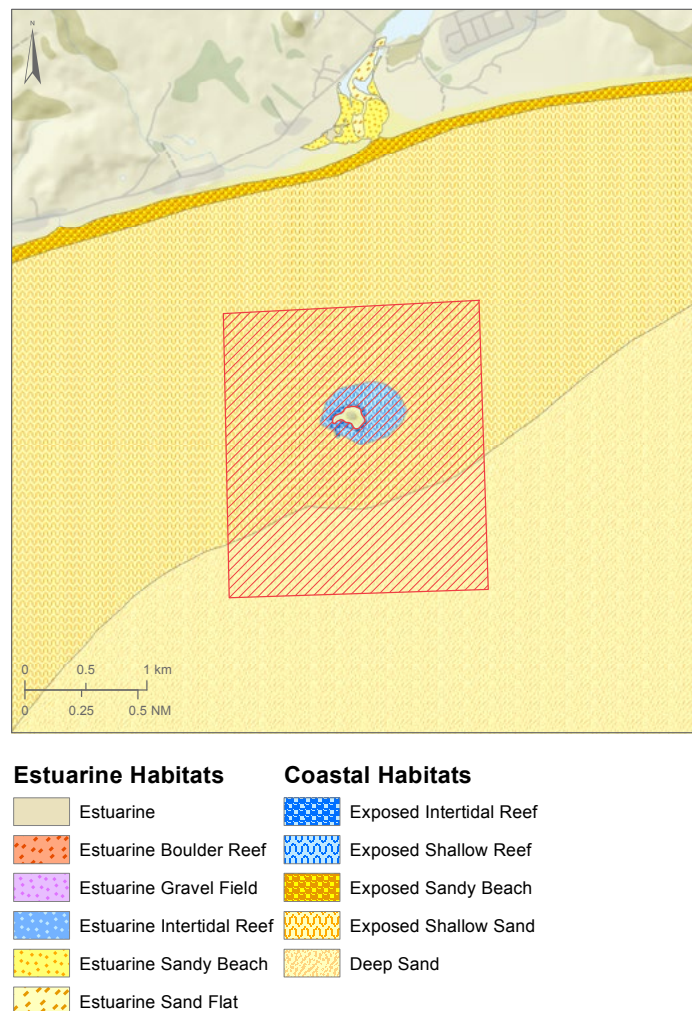


Figure 2-6: The mapped reef extent for Okaihae (Green Island).

⁷⁶ Widths have been derived from SeaSketch reporting and calculated in a Geographic Information System using the minimum width of a bounding box.

bisected by the boundary, the reserve may not be as effective. Therefore, an assessment of the boundary will need to be made during the proposed monitoring and review process detailed in these recommendations.

The remaining six sites are larger than 5 km at their minimum dimension and are generally considered likely to be viable with respect to the objectives of each site (as per MPA Planning Principle 2 and best practice^{77, 78}).

Table 2-6: Area, width and length of coastline for each Marine Protected Area (MPA) in Network 1

MPA name	Area (km ²)	Width (km)	Coastline length excluding estuaries (km)
A1 Tuhawaiki (Type 2 MPA)	157.5	9.9	40.6
B1 Waitaki South (Marine Reserve)	101.3	8.0	14.8
C1 Waitaki North (Type 2 MPA)	254.1	12.1	19.2
D1 Pleasant River to Stony Creek (Marine Reserve)	96.0	8.4	10.4
E1 Saunders Canyon & Surrounds (Type 2 MPA)	631.9	19.7	0
H1 Papanui Canyon (Marine Reserve)	173.2	11.3	0
I1 Harakeke Point to White Island (Marine Reserve)	28.7	3.4	19.5
K1 Okaihae (Green Island) (Marine Reserve)	5.0	2.1	0.7
L1 Akatorea estuary (Type 2 MPA)	0.3	0.7	0
M1 Akatore coastal (Marine Reserve)	5.9	1.4	9.3
Q1 Takahopa estuary (Type 2 MPA)	0.7	0.8	0

Protection standard

The protection standard⁷⁹ requires that the management regime must provide for maintenance and recovery at the site of a) physical features and biogenic structures that support biodiversity; b) ecological systems, natural species composition (including all life-history stages) and trophic linkages; and c) potential for the biodiversity to adapt and recover in response to perturbation.

It should be noted that trophic and ecosystem-level effects can occur because of fishing, environmental factors that are entirely unrelated to fishing (especially those related to climate variability / change) or a combination of fishing and environmental variability / change acting together (AEBAR 2016⁸⁰). The removal of fish can change the composition of species in the ecosystem, including their size, functional group composition, ecosystem role and diversity – which will, in turn, affect other species in the ecosystem through trophic linkages. Changes occurring across many trophic levels (ecosystem-level changes) can have implications for ecosystem resilience and increase ecosystem variability, and could increase recruitment variability. However, despite these factors being of critical importance in

⁷⁷ Thomas, H.L.; Shears, N. 2013: Marine Protected Areas: a comparison of approaches. The Royal Forest and Bird Protection Society of New Zealand, Wellington.

⁷⁸ Natural England; Joint Nature Conservation Committee 2010: Marine Conservation Zone Project: ecological network guidance. Natural England and Joint Nature Conservation Committee, Sheffield and Peterborough, UK.

⁷⁹ MPA Guidelines, p. 10–13.

⁸⁰ Ministry for Primary Industries. 2016. Aquatic Environment and Biodiversity Annual Review 2016. Compiled by the Fisheries Management Science Team, Ministry for Primary Industries, Wellington, New Zealand. 790 p.

evaluating how well a proposal will meet part (b) of the protection standard, understanding the scale and causes of these changes remains scientifically challenging. The MPA Guidelines highlight the problem with assessing ecosystem effects and the level of extraction that would ensure that the protection standard is met. Large amounts of information would be needed on the species that are present in an area and how they contribute to the associated ecological system.⁸¹ In addition, more in-depth information on commercial catch (and recreational catch in some circumstances) would be required than was available to the Forum.

Since there is insufficient information to determine the effects of specific fishing methods on ecosystems, the Network 1 proponents consider that a precautionary approach is necessary. This is consistent with the MPA Policy, as stated in Planning Principle 8, and the information principles contained in Section 10 of the Fisheries Act 1996.

Each site has been assessed on a case-by-case basis, which is consistent with the MPA Guidelines, whilst taking into consideration tool selection guidelines⁸² including the size of the MPA; the likely level of extraction; the frequency of extraction; and the type of species extracted, including its ecological significance.

Type 2 MPA restrictions

Trawling, dredging and Danish seining

It is recommended that bottom trawling, dredging and Danish seining are prohibited from all Type 2 MPAs, as these three methods prevent the maintenance and recovery of physical features and biogenic structures (part (a) of the protection standard).

Set netting

Taking into consideration the above and the particular ecosystems at each of the recommended Type 2 MPA sites (including the level of extraction), Network 1 proponents recommend that the Type 2 MPAs prohibit set netting. This is consistent with the MPA Protection Standard, which recognises that methods that extract large quantities of fish over short periods and that are relatively unselective may also be prohibited.⁸³ Also, species that are targeted by netting often have close affinities to the benthic environment. Commercial set netting occurs at Sites C1 and E1, while recreational set netting is permitted within Sites L1 and Q1.

Most of the species that are caught commercially in set nets are mobile predators such as mako (rig and school shark), which feed both in open water and near the sea bed. Similarly, rari (ling *Genypterus blacodes*) appear to be mainly bottom dwellers, as are hoka (red cod) and common warehou (*Seriolella brama*; a schooling species that usually aggregates close to the sea bed). These bottom dwellers and feeders have close affinities with the benthic environment. The MPA Guidelines recognize that the harvesting of these species by methods such as gill and benthic netting will likely not be permitted within an MPA.⁸⁴ These species play an important role in maintaining the balance in the food chain and help maintain existing trophic linkages within Sites C1 and E1.

⁸¹ MPA Guidelines, p. 11.

⁸² MPA Guidelines, p. 22–23.

⁸³ Ibid.

⁸⁴ MPA Guidelines, section 2.6.

- **Site C1:** Based on fishing years 2007/08 to 2015/16, MPI has estimated that 9.1 tonnes of commercial quota are removed by set netting from the area of Site C1 that currently allows set netting (approximately 121 km² of the 254 km² total area of Site C1) each year. The main species that are caught are mako (school shark; 4.3 tonnes), mako (rig; 2.5 tonnes) and mako repe (elephant fish; 1.1 tonnes). Mako (rig and school shark) are mobile species that feed both in open water and near the sea bed. They play an important role in maintaining the balance in the food chain and help maintain trophic linkages within Site C1.

Higher-level predators such as dolphins and penguins are also at risk of being caught as bycatch by set netting and trawling. Site C1 contains foraging habitat for the Nationally Endangered pahu (Hector's dolphin).⁸⁵ This population is thought to be part of the south-east South Island population of approximately 42 dolphins, that is found between Oamaru and Taieri Mouth.⁸⁶ Incidental mortality in coastal fisheries, particularly set net and to a lesser extent trawl fisheries, is the most significant threat to pahu (Hector's dolphins).⁸⁷ Incidental capture most frequently occurs in commercial set nets targeting mako (rig), mako repe (elephant fish) and mako (school shark).⁸⁸ Pahu (Hector's dolphins) are known to have been caught in the vicinity of Site C1 in 2008 and 2012.⁸⁹

The mainland populations of hoiho (yellow-eyed penguins) (which are Nationally Endangered⁹⁰) and koau (Stewart Island shag and spotted shag) all feed within Site C1 and are ranked as being at medium risk from set net fisheries based on data for the 2006/07 and 2012/13 years.⁹¹ This risk level was assigned to hoiho (yellow-eyed penguins) on the assumption that there were 600–800 breeding pairs. However, the mainland population of hoiho (yellow-eyed penguins) has declined to less than half of this, with 263 pairs being recorded for 2016,⁹² and so is now assessed as being at high risk.⁹³ Furthermore, the hoiho (yellow-eyed penguin) population decline has continued, with the latest count at 246 pairs for 2017, meaning that the risk is now likely to be even higher. Two hoiho (yellow-eyed penguins) were observed to have been caught in set nets in the vicinity of this site in 2009 and an additional penguin

⁸⁵ www.doc.govt.nz/Documents/conservation/native-animals/marine-mammals/conservation-status-of-new-zealand-marine-mammals-2013.pdf

⁸⁶ Ture, J.; Slooten, E.; Dawson, S.; Rayment, W.; Ture, D. 2013: Distribution and abundance of Hector's dolphins off Otago, New Zealand. *New Zealand Journal of Marine and Freshwater Research* 47: 181–191.

⁸⁷ Ministry for Primary Industries 2016: Theme 1: Protected species: Hector's dolphin (*Cephalorhynchus hectori hectori*) and Māui dolphin (*C. h. maui*). p. 141 in: Aquatic Environment and Biodiversity Annual Review 2016: a summary of environmental interactions between the seafood sector and the aquatic environment. Ministry for Primary Industries, Wellington. (Note: MPI is in the process of updating population estimates and reviewing the threat management plan.

⁸⁸ Ministry for Primary Industries 2016: Theme 4: Ecosystem effects: trophic and ecosystem-level effects. p. 409–443 in: Aquatic Environment and Biodiversity Annual Review 2016: a summary of environmental interactions between the seafood sector and the aquatic environment. Ministry for Primary Industries, Wellington.

⁸⁹ SeaSketch data: <http://seasket.ch/yMLRN3vnhA>

⁹⁰ Robertson, H.A.; Baird, K.; Dowding, J.E.; Elliott, G.P.; Hitchmough, R.A.; Miskelly, C.M.; McArthur, N.; O'Donnell, C.F.J.; Sagar, P.M.; Scofield, R.P.; Taylor, G.A. 2017: Conservation status of New Zealand birds, 2016. New Zealand Threat Classification Series 19. Department of Conservation, Wellington. 23 p. www.doc.govt.nz/Documents/science-and-technical/nztcs19entire.pdf

⁹¹ Richard, Y.; Abraham, E.R. 2015: Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006–07 to 2012–13. New Zealand Aquatic Environment and Biodiversity Report No. 162. Ministry for Primary Industries, Wellington. 85 p.

⁹² www.yellow-eyedpenguin.org.nz/penguins/population-recent-trends

⁹³ Ministry for Primary Industries 2016: Table 8.31. p. 253 in: Aquatic Environment and Biodiversity Annual Review 2016: a summary of environmental interactions between the seafood sector and the aquatic environment. Ministry for Primary Industries, Wellington.

was caught within the site in 2016.⁹⁴ However, the actual number that has been caught may be higher than this as only 3% of the metres of set net are observed by MPI observers across the East Coast of the South Island.⁹⁵ Kororā (little penguins) and other seabirds that forage at this site are also susceptible to set net capture.

- **Site E1:** Based on fishing years 2007/08 to 2015/16, MPI has estimated that 55.2 tonnes of commercial quota are removed by set netting from within Site E1 each year. The main species include mako (school shark; 34.3 tonnes), rari (ling; 10.6 tonnes), hoka (red cod; 5.8 tonnes), common warehou (1.3 tonnes) and blue moki (1.1 tonnes).⁹⁶ MPI data indicate that nets are set on average 123 times annually.

In the set net fisheries, there is a risk of incidental capture of higher-level predators such as seabirds, pahu (Hector's dolphin), other dolphins and kekeno (New Zealand fur seal). There is also a risk of incidental capture of rāpoka (New Zealand sea lion) from the Otago Peninsula south. The set net fishery within Site E1 overlaps with the foraging area of the Nationally Endangered hoiho (yellow-eyed penguin), which is currently ranked as being at medium risk from set net fisheries based on data for the 2006/07 and 2012/13 years. The medium risk was assigned to hoiho (yellow-eyed penguins) on the assumption that there were 600–800 breeding pairs. Since this the mainland population of hoiho (yellow-eyed penguins) has declined to less than half this, 263 pairs recorded for 2016. As a consequence mainland hoiho (yellow-eyed penguins) are now assessed as being at high risk due to a continuing population decline (see discussion under Site C1 above).⁹⁷ The hoiho (yellow-eyed penguin) population decline has continued and the latest count is 246 pairs for 2017, consequently the risk to the population may now be higher. Threats to Hoiho include climate-related impacts beyond immediate control such as sea surface temperature increases and disease, as well as non-climate related threats from fishing interactions, habitat degradation and human disturbance.⁹⁸ To protect these and other at-risk species, human-induced threats that can easily be addressed such as fishing interactions should be a priority.

Tracking data show that female rāpoka (New Zealand sea lions) forage within area E1. Rāpoka (New Zealand sea lion) is ranked as Nationally Critical and numbers fewer than 200 individuals on the mainland, nearly all of which are in the Forum region. The Otago population is currently expanding but at lower rates than predicted. Rāpoka (New Zealand sea lions) are known to be caught in set nets.

Set netting for mako (rig and school shark), and the incidental catches of marine mammals and seabirds may result in changes to the feeding of organisms within the food web, which may, in turn, impact on the natural species composition and trophic linkages of the marine ecosystem.⁹⁹ The prohibition of set nets will avoid any potential adverse effects on the aquatic environment and is likely to better enable

⁹⁴ SeaSketch data: <http://seasket.ch/yMLRN3vnhA>

⁹⁵ <https://psc.dragonfly.co.nz/2017v1/released/other-birds/setnet/all-vessels/eez/2015-16>

⁹⁶ See Appendix A1.2 for details on data limitations and full fisheries information.

⁹⁷ Ministry for Primary Industries 2016: Table 8.31. P. 253 in: Aquatic Environment and Biodiversity Annual Review 2016: a summary of environmental interactions between the seafood sector and the aquatic environment. Ministry for Primary Industries, Wellington.

⁹⁸ Mattern 2017. Quantifying climate change impacts emphasizes the importance of managing regional threats in the endangered Yellow-eyed penguin. PeerJ 5:e3272; DOI 10.7717/peerj.3272

⁹⁹ Ibid.

the maintenance and recovery of ecological systems, natural species composition and trophic linkages of Site E1, as well as contribute to the New Zealand Biodiversity Strategy¹⁰⁰ goal of halting the decline of New Zealand's biodiversity.

- Sites L1 and Q1: It is unknown how much set netting occurs recreationally in these estuaries. However, estuaries have limited habitat availability and so are relatively susceptible to extraction. Therefore, precaution is warranted to ensure that these ecological systems are maintained and the protection standard is achieved.

Line fishing methods

- Site A1: The use of longlines for fishing, including kontiki, can result in the significant harvesting of predators and therefore impact on the natural species composition and trophic linkages. Consequently, these methods are limited to a maximum of five hooks per line at Site A1. Limiting the number of hooks is seen as a practical way to reduce the level of extraction in order to meet the protection standard, while still allowing some recreational take.

Other fishing methods

- Sites L1 and Q1: These estuaries are recommended for Type 2 protection status using various method restrictions. The methods that are recommended to be prohibited are all net fishing methods, including set netting, net hauling, fyke netting and inaka (whitebait) netting. Digging for shellfish by any method other than hand is also prohibited. Methods that will be permitted are line fishing, spear fishing and digging for shellfish by hand.

The method restrictions are aimed at stopping any actual or potential bottom disturbance, excluding bulk harvesting and ensuring that ecological balance is maintained.

Tuna (short finned eel and long finned eel) are a highly significant component of freshwater ecosystems, comprising of most of the fish biomass and acting as a top predator. The commercial tuna (eel) fishing submission (submission #1957) states that up to 4.5 and 5.0 tonnes of tuna (short-finned eels) can be taken each year from Sites L1 and Q1, respectively, as part of a rotational harvest. The overall biomass of tuna (eels) within these estuaries is unknown, and the impact of commercial extraction is likewise unknown in estuarine environments. However, commercial harvesting of tuna (eels) has been shown to alter both the size and sex distributions in other populations.¹⁰¹ To ensure that the protection standard is met, and that ecological systems, natural species composition (including all life-history stages) and trophic linkages are maintained, harvesting methods that have the potential to extract significant numbers of tuna (eels) must be restricted. As such, a ban on all net fishing, in particular fyke nets, is warranted.

Protection for tuna (eels) and inaka (whitebait) was a particular priority for submitters, especially scientific contributors.

The proponents of Network 1 believe it is important to ensure that protection is established at a level where there is reasonable confidence that the sites meet the protection standard (and therefore contribute adequately to the network).

¹⁰⁰ Department of Conservation; Ministry for the Environment 2000: The New Zealand Biodiversity Strategy. Department of Conservation and Ministry for the Environment, Wellington. 146 p. www.biodiversity.govt.nz

¹⁰¹ Jellyman, D. J. 2007. Status of New Zealand fresh-water eel stocks and management initiatives. ICES Journal of Marine Science, 64: 1379–1386.

2.2.3.5 SITE T1 KELP FOREST – ECOSYSTEM ENGINEER AND BIOGENIC HABITAT

Kelp forests form the base of complex food webs that provide for both coastal and pelagic species, and provide habitat for numerous commercially harvested fish and invertebrate species. For example, kelp is known to be an important habitat for kōura papatea (rock lobster) settlement. Therefore, the harvest of kelp for fertilisers, fish food and human consumption could significantly reduce kelp biomass, altering food-web dynamics.

Network 1 proponents recommend Site T1 for the protection of giant bladder kelp forest habitat because of its commercial, recreational, social and cultural importance as a biogenic habitat. While this site does not contribute to the MPA network as it does not meet the protection standard as a Type 2 MPA, it does contribute to overall biodiversity protection. The MPA Policy explicitly states that in implementing the MPA Policy, protection can be given using a range of tools, i.e. Marine Reserves, other MPAs and other marine protection tools. All forms of marine protection are relevant when measuring progress towards the New Zealand Biodiversity Strategy target. However, only Types 1 and 2 are considered to be MPAs for the purpose of the MPA Policy.

2.2.3.6 CHALLENGES TO PROTECTING THREATENED AND HIGH-TROPHIC-LEVEL SPECIES

One of the limitations of the MPA Policy is the inability to practically focus protection on threatened marine species and higher-trophic-level species. Network 1 proponents are of the view that bycatch from set netting is a major issue in the Forum region, particularly for iconic and valuable marine mammals and birds. Other rarely seen species could also be impacted by set netting, such as large and ecologically important shark species.¹⁰² Submissions, particularly those from scientists, provided strong direction that protection for the diverse range of marine mammals, birds and higher-trophic-level species is required.

Network 1 proponents therefore see a set netting ban in Type 2 MPAs as critical for the protection of higher trophic level species. Network 1 proponents also have concerns about how the loss of biodiversity is affecting higher trophic level species and believe MPAs will help to restore natural diversity and abundance of prey for these animals. For example, hoiho (yellow-eyed penguins) have a varied diet and take many prey species such as hoka (red cod) and rawaru (blue cod) that are fished both commercially and recreationally.¹⁰³ The most important species taken, that corresponds to years of high breeding success are hoka (red cod) and opalfish. While the penguins generally take fish smaller than those caught commercially, the removal of large fecund fish will have an impact on fish populations.¹⁰⁴ There may also be indirect effects of fishing activities such as changes to food chains or bycatch of non-commercial fish species. Furthermore, disturbance of the seafloor by other, bottom impacting, methods has the potential to influence assemblages of benthic species and penguin prey, with subsequent impacts on penguin populations.¹⁰⁵

¹⁰² This includes thresher sharks (*Alopias* spp.), mako taniwha (great white sharks), porbeagle sharks (*Lamna nasus*), blue sharks (*Prionace glauca*) and mako (basking sharks).

¹⁰³ Moore P.J. & Wakelin M.D. 1997. Diet of the yellow-eyed penguin *Megadyptes Antipodes*, South Island, New Zealand, 1991-1993. *Marine Ornithology* 25: 17-29.

¹⁰⁴ Hixon M.A., Johnson D.W. & Sogard S.M. 2013. BOFFFFs: on the importance of conserving old-growth age structure in fishery populations. *ICES Journal of Marine Science*.

¹⁰⁵ Mattern T, Ellenberg U, Houston DM, Lamare M, Davis LS, et al. 2013. Straight Line Foraging in Yellow-Eyed Penguins: New Insights into Cascading Fisheries Effects and Orientation Capabilities of Marine Predators. *PLoS ONE* 8.

The Forum has been frustrated by what can be achieved under the existing policy. As a result, Site E1 is the only site that focuses on protecting a diversity of marine mammals, birds and other high-trophic-level species and their foraging habitats. This area provides the strongest case for protection, as it is iconic and of great economic and cultural importance for the Forum region. Site E1 is productive and this production is focused in a relatively small area most likely due to the canyons providing areas of upwelling of nutrient-rich waters. Our understanding of ecosystem functioning strongly suggests that higher trophic level species will be exerting top-down pressure on ecosystems at Site E1, thus influencing biodiversity.

2.2.4 Cultural use

A primary consideration under the MPA Guidelines is cultural use. The Forum must consider information on traditional use, values, economic value and Treaty settlement obligations.

Mātaimitai reserves and taiāpure can be designated as Type 2 MPAs provided they meet the provisions of the protection standard, which involves the prohibition of certain bottom-impacting fishing methods. The mātaimitai reserve in Paterson Inlet, Stewart Island (Te Whaka a Te Wera Mātaimitai) is the only mātaimitai reserve in New Zealand that has been designated as an MPA to date. Maintaining this designation requires the maintenance of the relevant fishing rules and is at the discretion of the customary reserve managers.

2.2.5 Whānau, hapū and iwi

Kāi Tahu did not initiate any component of Network 1 as this would have required the customary right holders for a specific area to propose concessions, which would be counter to the cultural values and belief of interconnection and rakatiratata over domain and resources. However, Kāi Tahu engaged fully in the collaborative 'gifts and gains' process, with a focus on ensuring that customary interests and rights were understood and the impact was minimised in any network design.

An historical agreement between Kāi Tahu and DOC that allowed rūnaka and whānau time to establish mātaimitai reserves and taiāpure prior to Marine Reserves being established was recognised positively by Kāi Tahu. However, it was predicted that there would be opposition to MPAs, particularly Marine Reserves south of the Mata-au (Clutha River), in part due to the desire for additional mātaimitai reserves to be established on The Catlins coast.

The Kāi Tahu position on Network 1 was influenced by the position of each papatipu rūnaka on proposed MPAs for their rohe moana. Historically hard-won gains to recognise and provide for customary fishing rights of manawhenua are not held lightly or easily relinquished.

The representation of Kāi Tahu on the Forum, which increased from the originally proposed two people to three full representatives (plus three alternates)¹⁰⁶, was an essential element for addressing Kāi Tahu interests. The Forum has recognised Kāi Tahu Treaty partner interests and values while balancing the interests of other sectors.

While rūnaka / Kāi Tahu support Network 1, they are seeking to have customary use included in the 25-year generational review process to leave the door open for consideration by that generation.

¹⁰⁶ The alternate for South Canterbury, the late Pauline Reid, passed away in the first year of the Forum.

There is disagreement over the Marine Reserve at Site O1 Irihuka (Long Point) because Kāi Tahu consider that it contains important customary and commercial fisheries resources, and have a long-held and continuing association with this site. There is a desire by Te Rūnaka o Awarua to establish more mātaimai reserves on this coastline.

2.2.6 Effects on existing users

Adverse impacts on users is a primary consideration under the MPA Guidelines when selecting sites. In particular, the guidelines instruct that *'Where there are choices of several sites that would add a similar ecosystem or habitat to the protected area network if protected, the site(s) chosen should minimise adverse impacts on existing users and treaty settlement obligations'*. The following sections explain how these guidelines were applied in Network 1.

2.2.6.1 COMMERCIAL FISHING

In developing their recommendations, the proponents of Network 1 aimed to limit negative impacts on important commercial fisheries in the region while maximising biodiversity gains. As a result, compromises have been made. Examples of this include Site D1 being placed in an area between two important commercial fishing areas (Arai-te-uru (Danger Reef) and Cornish Head – Pleasant Estuary mouth), the Tow Rock area being removed from Site I1 and Papanui Canyon being chosen over Saunders Canyon as a Marine Reserve.

These changes have compromised some aspects of MPA design (e.g. increasing edge effects) and have also meant that, in some cases, less accessible sites are included in Network 1 instead of more accessible sites that would have had bigger impacts on commercial fishing. Compromises were made in good faith to reach consensus with a goal of protecting and restoring biodiversity, while ensuring the local commercial fishing industry can continue.

MPI estimates the value of potentially displaced commercial catch in Network 1 to be \$3.6 million (based on the 2016 export value). This is estimated to represent approximately 10.5% of the export value of commercial fisheries in the Forum region, which totals \$34.4 million.¹⁰⁷ It should be noted that the figures used here only reflect one aspect of the value of commercial fisheries and are not a full socio-economic assessment.

The fishery that will experience the largest potential displacement is the kōura papatea (rock lobster) fishery (18.5%), which also has the largest potential economic impact due to its high value. However, the proponents of Network 1 note that kōura papatea (rock lobsters) are migratory and believe that the actual impacts on this fishery could be considerably less because of this.

Potential displacement provides a measure of the relative impacts of proposed MPAs. However, many factors influence what the actual impacts will be and it is important to note that displacement does not represent a definite impact. Furthermore, actual figures cannot be determined using the information that is currently available and so the data presented are based on the best estimates available.

¹⁰⁷ This figure is based on 2016 export prices. For some stocks, the 2017–18 port price is used as a proxy. Stocks for which no export or port prices are available are not included in the calculations and so the actual figures may be slightly higher than the estimates included here.

For many species, the spatial extent within which catches are reported means that we cannot be sure how much catch is taken in a specific area or the extent of the displacement of fishing effort. In addition, some species, particularly those that are more mobile, may be able to be caught in other areas. However, even for those species, the actual impacts will depend on whether the costs to catch the species change when effort is moved from one area to another. To illustrate this point, the catch reduction effects of the coastal set net ban do not appear to have significantly affected the set net yields but there are likely to be various other impacts that are not reflected in the catch figures, such as those affecting individual fishers.

Many other factors influence economic value, both negatively and positively, and there is the potential for the benefits of MPAs to positively affect fisheries or at least mitigate some of the possible impacts on the industry (e.g. see Section 5.1 – ‘Spillover’).

The following sections provide information on the fisheries that the Forum considers will be most affected by the establishment of Network 1 based on the information that was available (see Appendix 1.2 for a full analysis of the fisheries data). The levels of displacement for the main fisheries in the region are shown in Figure 2-9.

Kōura papatea (rock lobster) potting

There are only a few locations in the Forum region where reef habitats can be protected in a Marine Reserve, and so the proponents of Network 1 recommend Site D1 for inclusion within the network. No viable replicates for either moderate shallow reef or deep reef habitats occur beyond Site D1. Therefore, to meet the MPA Policy requirements, there will necessarily be some displacement of fishing. Impacts to the fishery will include a displacement of effort and reduced access to specific size classes of kōura papatea (rock lobster).

Because of the high value of kōura papatea (rock lobster), there is potential that the proposed Marine Reserves will have high economic impacts, particularly at Site D1 (15.5% displacement out of a total of 18.7% for Network 1 as a whole). However, the proposal intentionally avoids encompassing all reef areas, allowing kōura papatea (rock lobster) fishing to continue within the greater reef system. In addition, the majority of kōura papatea (rock lobsters) that are caught within this area are migratory and therefore likely to move outside the reserve and become available to fishers at some stage of their life.

Pāua diving

The pāua fishery is a high-value fishery and the most likely to be affected by area closures as this species does not cross MPA boundaries in any significant fashion. Sites D1, I1, K1 and M1 are the only sites that are likely to contain pāua. Sites D1 and M1 contribute minimally to the overall pāua catch in the region, a factor which, in part, formed the rationale for their inclusion in Network 1. Commercial pāua harvesting has been prohibited at Sites I1 and K1 for over 30 years with no negative impact on the pāua industry, which was one of the reasons for the inclusion of these sites in Network 1.

Trawling

The different intensities of trawling within the Forum region are shown in Figure 2-7. The recommended MPAs in Network 1 generally occur outside the main trawling grounds, reducing the potential impact on the fisheries. Of the agreed sites in the network, Site A1 is most likely to have adverse effects on trawl fisheries. (Note that Site A1 as recommended for Network 1 is an extension of what was initially consulted on (see the site description in Section 2.4.2 for details).

Sites C1, D1 and M1 will also displace trawling.

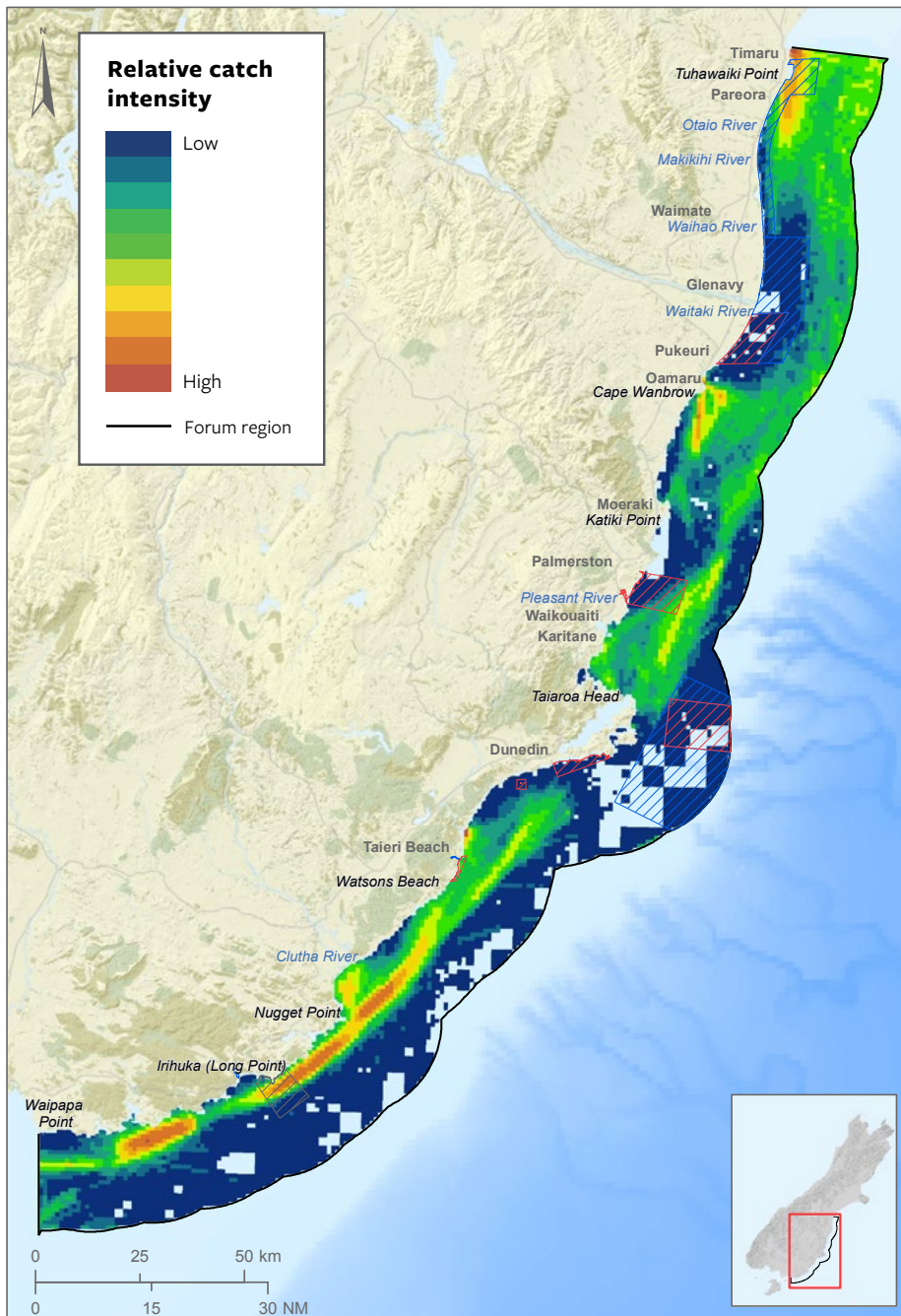


Figure 2-7: Distribution of trawl effort in the Forum region

Blue areas have low fishing intensity, while brighter coloured areas (yellow and orange) have high fishing intensity.

Set net fishing

The main potential for impact on the set net fisheries in Network 1 lies within Sites C1, E1 and H1. The principal species that would be affected by restrictions are mako (school shark and rig), with displacement values of approximately 15.5% and 6.9%, respectively, across these sites. The majority of the total set net catch intensity for all species combined occurs in areas north of the recommended MPAs at Sites C1 and H1 (see Figure 2-8).

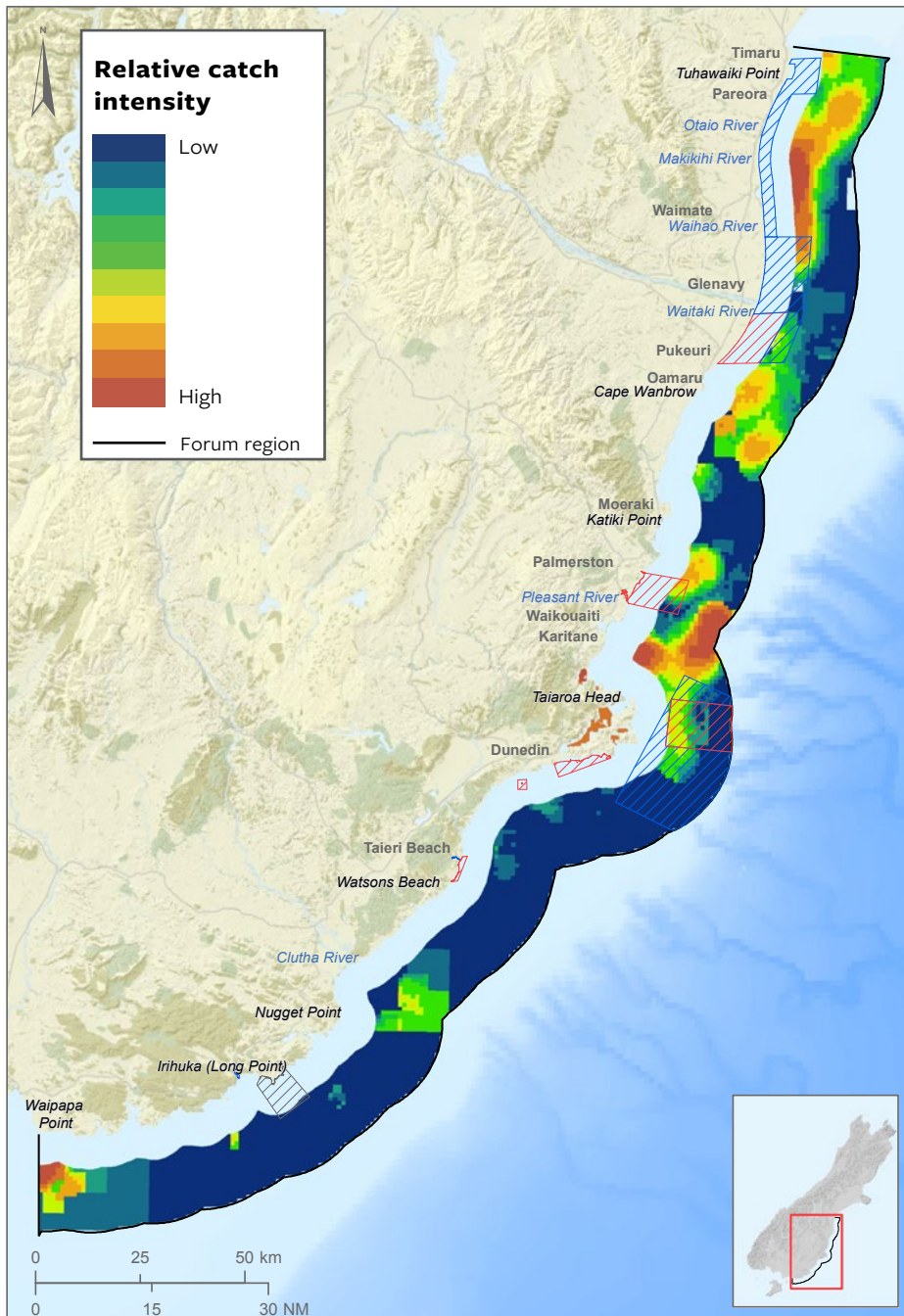


Figure 2-8: Distribution of set net effort in the Forum region

Blue areas have low fishing intensity, while brighter coloured areas (i.e. yellow and orange) have high fishing intensity.

Eeling

Commercial eeling is not reported on at a level that allows an assessment to be made of potential effects across all estuaries in the Forum region. Based on information contained in submission #1957 by the South Island Eel Fishing Industry, of the five estuarine sites that were proposed in the Consultation Document, the three that are contained within Network 1 appear to have the lowest potential impact. However, the actual effect that this network may have on the commercial catch is largely unknown.

Summary of commercial fisheries displacement

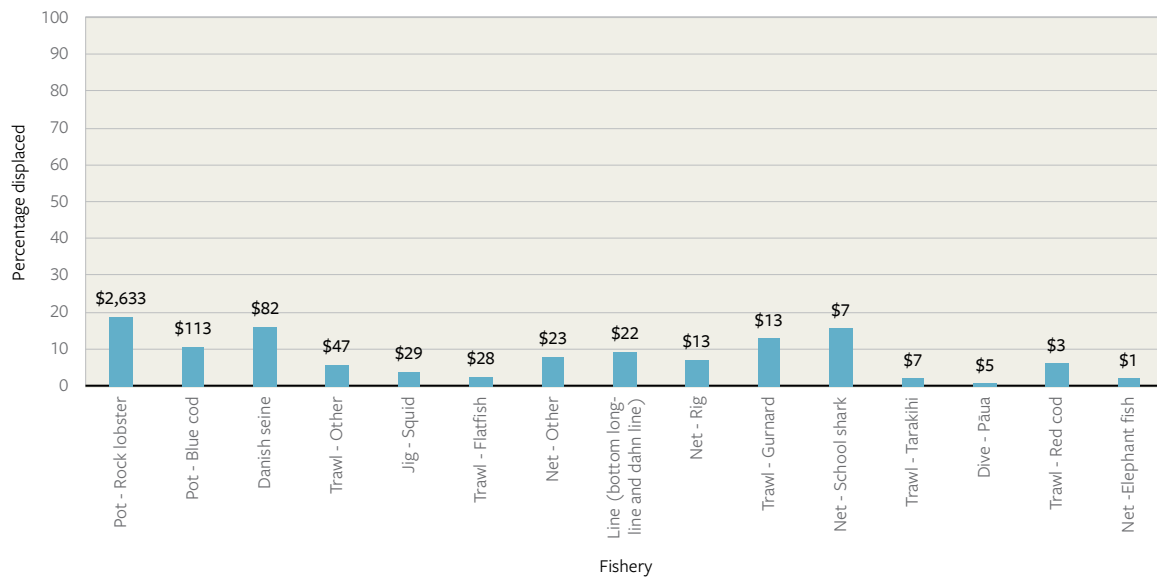


Figure 2-9: Commercial fisheries displacement in Network 1

Displacement relates to the amount of effort/catch that has occurred within the sites during the fishing years 2007/08 to 2014/15 that would be displaced by the proposals. Note that the percentage displacement is the proportion of displacement based on the Forum region (as opposed to the Quota Management Area) and does not equate to impact. The value of each fishery (\$1000) is provided above its respective bar, with fisheries presented in decreasing order of value displaced from left to right. Source: Department of Conservation and Ministry for Primary Industries.

2.2.6.2 RECREATIONAL FISHING

An assessment of recreational fishing sites of significance was undertaken during the Forum process in order to minimise the impact on recreational fishers when developing the sites for public consultation. This assessment was then further refined by considering public submissions that mentioned specific regions of recreational fishing significance. For example, one of the primary reasons for proposing a Marine Reserve over Papanui Canyon rather than the substantially larger and possibly more ecologically significant Saunders Canyon head was due to the significance of Saunders Canyon for recreational fishing.

Of all the boat fishing opportunities within the Forum region, only a very small percentage occur within the Marine Reserves proposed for Network 1.¹⁰⁸ Similarly, the proposed Marine Reserves contain only a small percentage of all of the habitat that is suitable for shellfish gathering, rock and beach fishing, spearfishing, kōura papatea (rock lobster) gathering and kohikohi inaka (whitebaiting). Consequently, the proposed reserves would have negligible negative impact on these recreational fishing opportunities.

Much of the pāua-suitable habitat that occurs within the proposed Marine Reserves in Network 1 has been subjected to significant commercial fishing pressure and offers limited opportunities for recreational pāua gathering. Sites I1 and K1 are exceptions to this general rule due to the commercial ban on pāua harvesting at these sites, which has resulted in these locations containing areas with excellent recreational pāua-gathering opportunities. However, recreational take at Sites I1 and K1 is restricted primarily to boat-based pāua gathering on the relatively few days with suitable sea conditions and there are other large areas within the region where commercial pāua harvesting is similarly prohibited and which have not been proposed for any form of protection. Therefore, these will continue to provide the same excellent recreational pāua-gathering opportunities as Sites I1 and K1.

The Type 2 MPAs that are contained within Network 1 will essentially have no impact on recreational fishing opportunities and will ultimately benefit recreational fishers by prohibiting the bulk extraction of fish (trawling, set netting) from important recreational fisheries (e.g. Waitaki River mouth, Saunders Canyon and surrounds).

2.2.6.3 SOCIAL AND ECONOMIC INTERESTS

Social and economic interests are also a 'primary consideration' when selecting sites under the MPA Guidelines.¹⁰⁹ Network 1 takes this into account as detailed in the following sections.

Tourism

Tourism is a major economic activity in the Forum region, with eco-tourism alone being estimated to be worth over \$100 million per year to the Dunedin economy in 2007.¹¹⁰ Much of the tourism in the region is based on a range of marine wildlife species, and the productive and diverse marine ecosystems that support this wildlife. Iconic species such as hoiho (yellow-eyed penguin), kororā (little penguin), toroa (albatross), pahu (Hector's dolphin) and rāpoka (New Zealand sea lion) use a range of habitats that extend from the shallower waters out onto the shelf and the 12 NM limit of the Forum region. The loss of these vulnerable iconic species and a decline in the supporting cast of less charismatic marine creatures would directly impact tourism and represent lost economic opportunities for a sustainable industry.

¹⁰⁸ Areas contained within proposed Marine Reserves in Network 1 where boat fishing currently takes place include a portion of Arai-te-uru (Danger Reef), Papanui Canyon, Gull Rocks and Okaihae (Green Island). Areas within the Forum region where boat fishing currently takes place that will not be negatively affected by the proposed network of MPAs include Oamaru offshore, Kakanui-Moeraki offshore, Moeraki inshore, Matakaea (Shag Point) offshore, Matakaea (Shag Point) inshore, remainder of Arai-te-uru (Danger Reef), Karitāne offshore, Karitāne inshore, Brinns Point, Saunders Canyon, Cape Saunders, Tow Rock, Dow's Patch, Ponuahine (White Island) – Black Head, Brighton – Taieri mouth inshore, Taieri mouth offshore, Akatore / Measly Beach / Wangaloa offshore, Nugget Point – Waipapa Point inshore, Irihuka (Long Point) offshore, Uira (Chaslands), Waikawa offshore and Fortrose offshore.

¹⁰⁹ MPA Guidelines, p. 22.

¹¹⁰ Tisdell, C.A. 2008: Wildlife conservation and the value of New Zealand's Otago Peninsula: economic impacts and other considerations. University of Queensland, Brisbane.

The protection of iconic species and, in particular, their habitat was one of the significant considerations when designing Network 1. The MPAs in Network 1 are in strategic locations to protect key biogenic habitats, reduce bycatch and protect the range of trophic levels that support many of the apex predators that draw tourists to the region. The MPAs in Network 1, and particularly those positioned off the Otago Peninsula, will provide many opportunities to further highlight the natural values of this region, helping to attract more people to enjoy the local marine environment and benefiting local economies.

In terms of accessibility and educational interest, Network 1 includes some outstanding sites, notably Pleasant River to Stony Creek, Harakeke Point to Ponuahine (White Island) and the Akatore Coast. These places offer attractive contrasting environments that can be enjoyed by local people and visitors.

Charter fishing is a minor part of the tourism industry in the Forum region that could be impacted by Marine Reserve area closures. However, Network 1 has avoided the most popular charter fishing areas such as Moeraki and Saunders Canyon, and so any impact on charter fishing operations is predicted to be minor.

Education and other recreational users

Network 1 offers accessible and interesting sites that are close to major population centres in Timaru, Oamaru and Dunedin for those who wish to pursue no-take snorkelling, diving and underwater photography. Some sites, such as Akatore and parts of the Harakeke site, have easily accessible rock pools for shore-based explorers and school groups.

2.2.6.4 BENEFITS FOR SCIENCE

Network 1 provides an opportunity to build on existing research and provide a basis for new research within the Forum region. A range of protection measures across different habitat types provides an interesting context for research that seeks to understand the benefits of full fishery closures versus partial closures in tandem with other stressors (e.g. sediment loading and climate change). All of the MPAs in this network are within a relatively small distance of the Portobello Marine Lab and can be accessed for research when conditions allow. Marine Reserves will also provide a much-needed reference for a number of exploited species (e.g. pāua and rawaru (blue cod)), thus assisting in future fisheries management.

Some areas that are included in the proposed MPAs have a long history of research (e.g. the shelf off the Otago Peninsula and the kelp forests along the north Otago coast), while others have not been extensively studied. It is expected that the proposed MPAs will be regularly surveyed, which will provide an impetus for gaining valuable long-term datasets and learning more about poorly understood ecosystems in the Forum region. Opportunities for research on the co-management of MPAs, and wider analyses of the economic and social impacts of MPAs will also be provided.

The scientific community has provided substantial support for the Forum process and has expressed strong support for an MPA network that is far more extensive than that proposed in Network 1. The proponents of Network 1 expect some disappointment in the proposed network but know that the scientific community stands ready to make the best of the opportunities provided by the new MPAs that are proposed.

2.3 NETWORK 2

2.3.1 Network overview

Network 2 proponents consider that achieving reasonable and effective biodiversity protection is a multi-stage process, which begins with carefully defining the objectives and identifying threats, as well as protecting habitats that are significant or unique. This foundation work is followed by a considered review of potential regional impacts in order to propose the most cost-effective tool.

Network 2 was developed with assistance from both commercial and recreational fishers with up to 50 years' experience of fishing and diving in this region, as well as people with a detailed understanding of the region's habitats, fisheries, marine birds and mammals – many of whom have experienced and could describe the changes that have happened on this coast in the last 40 years.

Network 2 has been designed to protect significant features and habitats from various fishing methods while minimising adverse impacts on existing users (see Table 2-7 and Figure 2-10). The commercial sector initiated the proposed Type 2 protection of the bryozoan beds at Site G2 in recognition of the importance of protecting these habitats from bottom-contact methods such as bottom trawling, Danish seining and dredging.¹¹¹ Methods that have a lower environmental impact, such as set netting, can continue as they have now been used for a number of years with little impact on the stock status of mako (school shark) for example, particularly at Site G2. These restrictions and the new MPAs have the potential to be part of the rebuilding of biogenic habitats and trophic linkages, and could be relevant when measuring progress towards the New Zealand Biodiversity Strategy target (as distinct from the MPA Policy), if assessed as making an effective contribution.

Network 2 proponents placed significant weight on the requirements to consider social and economic interests outlined in both the MPA Guidelines¹¹² and Planning Principle 5¹¹³, and aimed to minimise impacts on existing users.

Five major fishing methods are used in the inshore South-East Coast Commercial Fishery:

- Trawling by small trawlers targeting pātiki (flatfish) in an inshore mixed trawl fishery on a sandy bottom, working with a low headline to limit bycatch
- Set netting targeting mako (school shark and rig) and mako repe (elephant fish)
- Potting for kōura papatea (rock lobster), ling, rawaru (blue cod) and papaka (paddle crabs *Ovalipes catharus*)
- Hand gathering of pāua and tuaki (cockles)
- Long lining for rari (ling) and mako (rig).

¹¹¹ The Type 2 protection of the bryozoan bed cover, and extend beyond, some of the existing voluntary no-trawl area.

¹¹² MPA Guidelines p. 22.

¹¹³ Planning Principle 5 of the MPA Policy (p. 18) states that adverse impacts on existing users of the marine environment should be minimised in establishing MPAs.



Figure 2-10: Location of the 5 proposed Marine Protected Area (MPA) sites in Network 2
 Marine Reserves are shown in red, Type 2 MPAs are shown in blue.

These specific fishing methods have mainly been designed in response to fish behaviour, mesh selectivity or configuration, and the morphology of particular species or mixes of species. Trawling, potting and set netting have been utilised in the same areas along this coast since 1868, starting in Dunedin.¹¹⁴ Network 2 proponents are of the view that the sustained yields of some species over the last 20 years are a testament to the sustainability of commercial fishing on this coast when combined with effective fisheries management and catch reporting regimes.¹¹⁵

Network 2 includes MPAs to protect the biodiversity of the proposed sites, including important biogenic habitats. This network also allows for the protection of two important recruitment and juvenile grounds for mako repe (elephant fish), pātiki (flatfish), tarakihi (*Nemadactylus macropterus*) and mako (school shark). Network 2 proponents consider it most appropriate to evaluate the level of protection recommended in Network 2 in tandem with existing fisheries management restrictions and spatial closures, as well as customary closures through mātaimai reserves.

Network 2 proponents do not propose additional restrictions to fishing methods in the Type 2 MPAs as they do not consider that these can be justified. Other factors are impacting on the distributions and populations of hoiho (yellow-eyed penguin), kekeno (New Zealand fur seal) and other seabirds, in light of which Network 2 proponents decided that additional restrictions could not be justified.¹¹⁶

Schools of kokowhāwhā (sprats), ahura (*Auchenoceros punctatus*) and para (silver fish), and shoals of *Munida* were once abundant and an essential part of the seabird diet but are now sparse for unknown reasons. Network 2 proponents consider that the decline in these important food species not only affected the stock levels of muheke (squid) and hoka (red cod), impacting on the commercial sector, but also may have led to the decline and starvation of protected seabirds and mammals. For instance, Network 2 proponents are of the understanding that *Munida* played a key role in the trophic linkage between the seafloor and pelagic layers and the species that forage within those layers.¹¹⁷

None of the proposed sites and boundaries in Network 2 have been modified from those that were presented for consultation (with the exception of Site D2, which no longer includes the estuaries). The rationale behind Network 2 is covered in the commercial industry submission,¹¹⁸ which is publicly available on the Forum's website. The proposed MPAs have been included in this network for the following reasons:

- **Type 2 MPA (A2) Tuhawaiki** – protects three regional habitat types. This area is important for mako (school shark) pupping and mako repe (elephant fish) eggs, making it of particular significance for fisheries management. It is therefore appropriate to implement management measures under the Fisheries Act.
- **Marine Reserve (B2) Waitaki Coastal** – adds two habitats that are not included elsewhere in the proposed Network 2 (including one habitat that is also not included in existing mātaimai reserves).

¹¹⁴ See Johnson, D.; Haworth, J. 2004: Hooked: The story of the New Zealand fishing industry. Hazard Press, Christchurch. 551 p.

¹¹⁵ See MPI Plenary documents 2017, Volumes 1–3 for inshore stocks in Fisheries Management Area 3 (FMA3).

¹¹⁶ Y van Heezik (1990). Seasonal, geographical, and age-related variations in the diet of the yellow-eyed penguin (*Megadyptes antipodes*). *New Zealand Journal of Zoology*, Vol 17:2, 201-212

¹¹⁷ J R Zeldis (1985). Ecology of *Munida gregaria* (Decapoda, Anomura): distribution and abundance, population dynamics and fisheries. *Marine Ecology Prog Ser*, Vol 22: 77-99, 1985

¹¹⁸ See submission 2467.

The biodiversity protection benefits of this MPA are important when considering spatial protection of juvenile fish habitat.

- **Marine Reserve (D2) Pleasant River to Stony Creek** – adds two habitat types that are not represented elsewhere in the network, as well as one sensitive biogenic habitat, *Macrocystis* beds. This site contains biodiversity values that may meet the Marine Reserves Act criteria and therefore it may be appropriate to establish a Marine Reserve here.

The biodiversity protection benefits of this coastal MPA are substantial as it includes reef habitats that ensure kelp growth (which then allow for juvenile kōura papatea (rock lobster) protection). The reduced extent of *Macrocystis* beds between Tokatā (The Nuggets) and Ponuahine (White Island) represents a major loss of this habitat on the south-east coast. While some kelp species are managed under the Fisheries Act and not considered directly under the MPA Policy, Network 2 has been designed to include some of this habitat.

- **Type 2 MPA (G2) Bryozoan Thickets** – protects two regional habitat types, as well as one sensitive biogenic habitat type, bryozoan bed. The proposed restrictions contribute to avoiding, remedying or mitigating adverse effects of bottom-perturbing fishing methods on sensitive bryozoan habitats. It is therefore appropriate to implement management measures under the Fisheries Act.
- **Marine Reserve (H2) Papanui Canyon** – protects three regional habitat types and bryozoan habitat. This canyon may contain biodiversity values that are potentially consistent with Marine Reserves Act criteria and therefore it may be appropriate to establish a Marine Reserve here.

Proponents of Network 2 support co-management and generational review.

2.3.1.1 MPA NETWORK 2

Table 2-7: Network 2 sites

Names, protection tool, and how each relates to what was consulted on.

Site Name	MPA Type	Relationship to Consultation
A2 - Tuhawaiki	Type 2	Site A – as consulted on
B2 - Waitaki Coastal	Marine Reserve	Site B – as consulted on
D2 - Pleasant River to Stony Creek	Marine Reserve	Site D – as consulted on (except estuaries removed)
G2 - Bryozoan Thickets	Type 2	Site G – as consulted on
H2 - Papanui Canyon	Marine Reserve	Site H – as consulted on

The Network 2 proposal has resulted from collaboration between the Forum’s three commercial fishing representatives and one recreational fishing representative. These representatives also took into account significant input and mandates from a wide range of interested parties, including recreational fishing clubs from Oamaru to Gore, commercial fishing representatives (at both a national and local level across all industry sectors) and a significant number of fishers, including fishers from Timaru to Bluff.

The key rationale for this network proposal included:

- The protection of important bryozoan beds from potential damage from trawling and dredging.
- The inclusion of one canyon feature and other coastal areas that provide habitats for marine resource enhancement by protecting rocky reef and adjacent kelp beds.

There are currently seven mātaītai reserves in the Forum region – Tuhawaiki, Waihao, Moeraki, Waikouaiti, Ōtākou, Puna-wai-Tōriki and Waikawa / Tumu Toka. These mātaītai reserves cover a substantial geographic range and include 20 different regional habitat types (see Table 2-8). Mātaītai reserves are expressly recognised in Policy 3.6(a) of the New Zealand Biodiversity Strategy as a tool that can be utilised as part of a network of areas to protect marine biodiversity, even though they are established for customary fishing purposes. Network 2 proponents acknowledge that it is up to rūnaka to determine their aspirations for customary tools and whether or not these should take the form of MPAs. Mātaītai reserves prevent commercial fishing unless permitted specifically through a regulation, which has been taken into account by the Network 2 proponents.

Fishing is limited on the south side of the peninsula, in the area from Harakeke Point to Ponuahine (White Island) as a result of the impact of discharges from the Tahuna and Green Island wastewater treatment plants, fishing restrictions and closures for public health reasons. Consequently, there is no trawling, dredging, set netting, or commercial harvesting of pāua in this area. Network 2 proponents have taken into account anecdotal reports that the extended sewage outfall has closed the commercial tuaki (cockle) fishery in Papanui Inlet on the peninsula and shifted the migration of mako (school shark and rig) further off the coast. Because of the reasons above Network 2 does not include Marine Reserves south of the Otago Peninsula.

Okaihae (Green Island), has potential as an important site for the restoration of the kelp forest on the reef, which extends south-west from its shoreline. Network 2 proponents did not propose the establishment of a Marine Reserve at Okaihae (Green Island) because it is an area where kelp forest previously thrived.

Extensive areas of kelp forest have been lost from Okaihae (Green Island) to Tokatā (The Nuggets), and the proponents of Network 2 consider that the opportunity to rebuild fundamental biogenic habitats is important. Based on techniques developed for the restoration of Kelp forests in Chile, proposals for funding have been developed to enable the testing of Kelp forest restoration in this region.

Otago Regional Council's plan change 6A regulates sediment discharge to rivers, providing the potential opportunity to restore kelp that has been lost to high levels of fine sediment.

While it is acknowledged that the degradation of neritic waters south of the Otago Peninsula has removed important biogenic habitat and essential prey species, Network 2 proponents could find no evidence in the literature that this significant loss of biodiversity will be rebuilt through the creation of Marine Reserves or the closure of areas for seabird foraging.

In the Network 2 proponents' view, a rebuild is the only option to maintain and recover the biological diversity in this area to a healthy functioning state at the habitat and ecosystem level.

Network 2 proponents did not recommend the establishment of a Marine Reserve at Irihuka (Long Point) due to the social and economic impacts it may have on the local community and commercial fishers.

2.3.2 Contribution to the MPA Policy objective

2.3.2.1 REPRESENTATION

Together, the five proposed MPAs in Network 2 represent ten regional habitat types and two sensitive habitats (bryozoan and *Macrocystis* beds) (Figure 2–11).

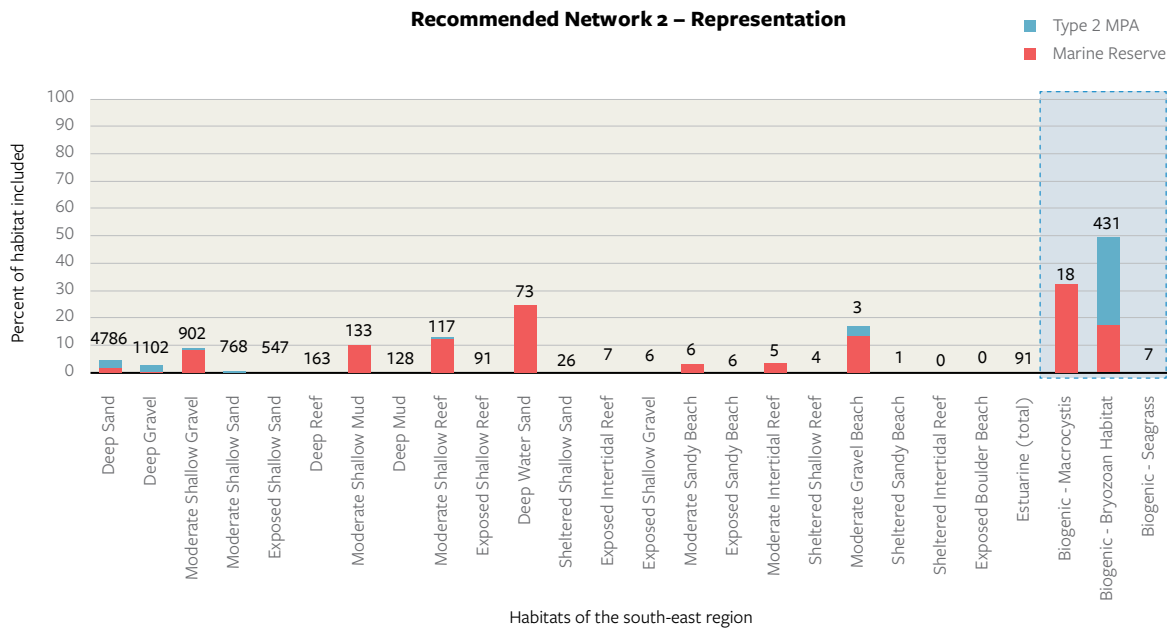


Figure 2–11: Network 2 representation

Representation is shown as the percentage of each habitat type within the Forum region that is covered by Marine Reserves and Type 2 Marine Protected Areas. The habitats are ranked from left to right in terms of overall area of habitat within the region (with area shown above the bar in km²), with the most extensive habitats to the left (habitats that cover less than 0.5 km² are shown as '0'). The 22 coastal habitats are shown on the left, while estuarine and biogenic habitats are shown in the shaded area to the right (biogenic habitats in the shaded area). Source: Department of Conservation and Ministry for Primary Industries.

Network 2 proponents (without the approval of Kāi Tahu) seek that the proposed network be evaluated together with existing mātaītai reserves along with other restrictions on commercial fishing. While it is acknowledged that these other mechanisms have been assessed as not meeting the protection standard (based on their current level of restrictions), Network 2 proponents believe that the consideration of all restrictions together will give a more complete assessment of the level of marine protection that is recommended by Network 2. Te Whaka a Te Wera Mātaītai Reserve is one example of an area where additional restrictions can be made to meet the protection standard and allow it to be assessed as an MPA.

On this basis, 24 regional habitat types and three sensitive habitats would fall under some form of protection within the Forum region, along with the additional habitats that occur within existing mātaītai reserves. All 27 habitat types would be represented in areas where all commercial fishing was prevented (either within a Marine Reserve or a mātaītai reserve), with the replication of seven habitat types in Type 2 MPAs.

The coverage provided by the proposed network and existing mātaimai reserves is shown in Table 2-8. Disclaimer: Kāi Tahu have not been consulted on this table and are therefore opposed to its content and inclusion.

Table 2-8: Summary of habitat representation in Network 2

The table provides a summary of the percent of each broad-scale and biogenic habitat type that is included in Network 2 (representation), and replication for each habitat, both by Marine Reserve and Type 2 MPA. Also included is an indication of which habitats are included within existing mātaimai: (1) Tuhawaiki; (2) Waihoa; (3) Moeraki; (4) Waikouaiti; (5) Otakou; (6) Puna-wai-toriki; (7) Waikawa.

Regional habitat types included (1-24) and biogenic habitats (25-27)	Total habitat in region (km ²)	Representation (%)					Existing Mātaimai
		MPA (A) Type 2	MPA (B) Type 1	MPA (D) Type 1	MPA (G) Type 2	MPA (H) Type 1	
1 Deep Gravel	1102.15				2.3	0.5	
2 Deep Sand	4785.77				2.6	1.7	
3 Deep Water Sand	73.10					24.7	
4 Exposed Intertidal Reef	7.21						7
5 Exposed Sandy Beach	6.34						7
6 Exposed Shallow Reef	90.88						6, 7
7 Exposed Shallow Sand	547.14						5, 7
8 Moderate Gravel Beach	3.24	3.8	13.2				1
9 Moderate Intertidal Reef	5.23			3.6			1, 3, 5, 6
10 Moderate Sandy Beach	6.43			3.2			3, 6
11 Moderate Shallow Gravel	901.77		8.2				1
12 Moderate Shallow Mud	132.93		10.2				
13 Moderate Shallow Reef	116.82	0.5		12.6			1, 3, 5, 6
14 Moderate Shallow Sand	768.34	0.5					1, 3, 5, 6
15 Estuarine	9.04						2, 3, 4, 7
16 Estuarine Boulder Beach	0.02						7
17 Estuarine Cobble Beach	0.06						7
18 Estuarine Gravel Beach	0.33						2, 4
19 Estuarine Gravel Field	0.43						4
20 Estuarine Intertidal Reef	0.82						4, 5, 7
21 Estuarine Mud Flat	42.59						4, 5, 7
22 Estuarine Reef	0.20						5
23 Estuarine Sand Flat	20.67						3, 4, 5, 7
24 Estuarine Sandy Beach	16.43						3, 4, 5, 7
25 Biogenic - <i>Macrocystis</i>	18.00			32.2			3, 6
26 Biogenic - Bryozoan Habitat	431.00				32.0	17.4	
27 Biogenic - Seagrass	7.20						5, 7

2.3.2.2 REPLICATION

While the MPA Policy is prescriptive towards collating habitat types and requesting replication within a network, Network 2 proponents disagree with the need for replication across biogeographic regions. Some habitats are already protected in other biogeographic regions and so can be considered replicated across the wider network of habitats and MPAs. Although there may be some latitudinal variation, the replication of the same habitat across other areas can be implicit (i.e. mud in the North Island can be similar to that in the South Island).

Network 2 replicates the protection of habitats that are present in other areas outside the Southern South Island biogeographic region (e.g. the Kaikoura Canyon), as well as those habitats within the region that are protected by other spatial management measures and closed areas (e.g. mātaītai reserves).

Of the 22 broad-scale coastal habitats that are found within the region (i.e. excluding the 12 estuarine habitats):

- Six meet the minimum requirements for inclusion in at least one Marine Reserve and replication in one other MPA (Figure 2-12)
- A further four are included in a Marine Reserve but are not replicated (Figure 2-12)
- An additional four are included in the existing mātaītai reserve only (not included in Figure 2-12).

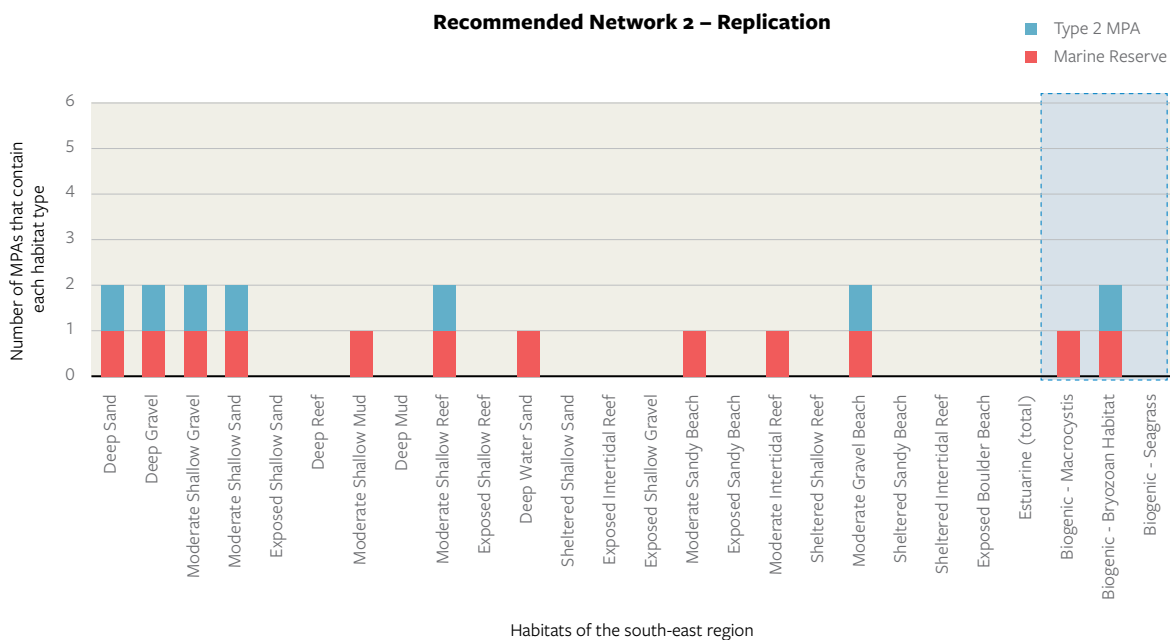


Figure 2-12: Network 2 replication

The minimum requirement under the Marine Protected Areas Policy and Implementation Plan (the MPA Policy) is for each habitat to be represented in a Marine Reserve with at least one further replicate in another MPA (either Marine Reserve or Type 2 MPA). Source: Department of Conservation and Ministry for Primary Industries.

2.3.2.3 CONNECTIVITY

Connectivity is difficult to measure accurately with only basic assessments possible, and so the use of connectivity for any MPA design is questioned by Network 2 proponents. The average distance between the MPAs in Network 2 is 73.9 km. Subtidal rocky reef habitats appear to be poorly connected across the Forum region at the 50–100 km level (excluding the unmeasured influence of the Southland Current). The absence of any reef examples south of Taiaroa Head, and questions around the viability of the northern example at Site A2 and the efficacy of Site D2 where the boundary crosses sections of the reef along its entire length were considered.

The proponents of Network 2 believe that other managed areas provide for connectivity.

2.3.2.4 VIABILITY

The viability of an MPA and whether it meets the protection standard relates to its overall size and the placement of its boundaries in relation to habitats (see Table 2-9 for MPA details).

Table 2-9: Area, minimum width and coastline length of Network 2 MPAs

MPA name	Area (km ²)	Width (km)	Coastline length (km)
A2 - Tuhawaiki (Type 2)	4.4	1.1	4.2
B2 - Waitaki South (Marine Reserve)	88.4	8.0	14.8
D2 - Pleasant River to Stony Creek (Marine Reserve)	15.3	2.1	10.4
G2 - Bryozoan Thickets (Type 2)	151.8	8.2	0
H2 - Papanui Canyon (Marine Reserve)	106.3	6.9	0

When considered alone, it is highly improbable that Site A2 will meet the protection standard in any ecologically meaningful way, mainly due to its small size. However, when examined in tandem with the existing mātaimitai reserve, this site is considered to provide suitable protection as well as a useful buffer to the mātaimitai reserve.

Site B2 extends over 11 km of the coastline and at least 6.7 km offshore, making it viable. The principle purpose of this site is to protect the kelp habitats and offer protection for juvenile fish. There is a known potential threat of water quality degradation by inputs from the Waitaki River, which will need to be redressed by the Resource Management Act 1991 to ensure that any impacts are minimised and remedied. This consideration should not be as a consequence of the establishment of this Marine Reserve but rather should be a priority of regional authorities regardless of the presence or absence of an MPA.

Consistent with the Marine Reserves Act, Site D2 contains features that are ‘of such distinctive quality, or so typical, or beautiful or unique that their continued preservation is in the national interest’, namely the bladder kelp forest. It should be noted that there is no additional bladder kelp forest beyond the outer boundary of Site D2, but a wider range of habitat types would be protected by the D1 option.

Sites G2 and H2 were proposed as a set to protect the bryozoan beds and canyon feature. Site G2 is viable as it covers an area of 19 km by 8 km, while Site H2 is approximately 14 km by 7 km. When considered together, these sites offer protection over a substantial area while minimising adverse impacts on commercial and recreational fishers compared with the alternatives.

Type 2 MPA restrictions

Bottom trawling, dredging and Danish seining will be excluded from the Type 2 MPAs in Network 2 to protect the habitats they contain. The two proposed Type 2 MPAs at the mouth of the Waitaki River, and the bryzoan beds and areas of potential bryzoan habitat off the Otago Peninsula represent large closures. Network 2 does not include any recommended restriction on set netting, however, which currently targets mako (rig and school shark¹¹⁹) at levels that are well within sustainability considerations as they travel through these areas. In keeping with the tool selection guidelines provided in the MPA Guidelines, the ‘large size of the MPAs compensate for any higher level of biological extraction’¹²⁰. In addition, it is noted that the tools section of the MPA Policy states that ‘MPAs are better at protecting species that are sedentary or have limited mobility’.

Protection standard

The protection standard¹²¹ requires that the management regime provides for the maintenance and recovery at the site of a) physical features and biogenic structures that support biodiversity; b) ecological systems, natural species composition (including all life-history stages) and trophic linkages; and c) the potential for the biodiversity to adapt and recover in response to perturbation.

The biodiversity changes that concern Network 2 proponents affect trophic levels that are not fished commercially or by recreational fishers but are being impacted by climatic and oceanographic influences, which in the opinion of the Network 2 proponents, will not be solved through the establishment of MPAs. Network 2 proponents believe that squat lobsters (*Munida gregaria*) were once present in an enormous abundance in this region and acted as a primary link between the plankton, the seafloor environment and soft-mouthed fish species at higher trophic levels such as tarakihi, hoka (red cod), warehou (*Seriolella brama*) and muheke (squid). The formerly common bait fishes ahura (*Auchenoceros punctatus*), silversides and kokowhāwhā (sprats) have also gone from reported schools of 1 to 2 million to rarely being seen by fishers – although these were never commercial target species or bycatch in this area, their loss could impact on other species that rely on them, such as hoiho (yellow-eyed penguin). In addition, the loss of a significant number of hectares of kelp forest, which is one of the coast’s primary building blocks, has reduced the amount of habitat for a number of species.

Many other changes have also occurred in this region, not all of which are a consequence of commercial fishing inshore. For example, squid boats no longer fish inshore, preferring deeper offshore areas; hoka (red cod) have gone from being unavoidable when fishing to being caught in significantly smaller numbers on a very cyclical basis depending on the conditions; hoiho (yellow-eyed penguins) have declined in population numbers since the early 1990s due to a number of factors. The causes of decline are complex.

Network 2 proponents consider that the loss of biogenic structures and important trophic linkages, and changes in species composition are impacting the entire length of this biogeographic region. However, since these changes are not considered to have been caused by fishing, they are of the view that the establishment of a Marine Reserve will not maintain or recover these trophic linkages and therefore cannot meet the protection standard.

¹¹⁹ The Kāi Tahu dialect does not differentiate between rig and shark. ‘Mako’ is used interchangeably for both species.

¹²⁰ MPA Guidelines, p. 22–23.

¹²¹ MPA Guidelines, p. 10–13.

2.3.3 Whānau / hapū / iwi

Kāi Tahu did not initiate any component of the two proposed networks as this would have required the customary right holders for a specific area to propose concessions, which would be counter to the cultural values and belief of interconnection and rakatirataka over domain and resources. However, Kāi Tahu engaged fully in the collaborative ‘gifts and gains’ process, with a focus on ensuring that customary interests and rights were understood and the impact was minimised in any network design.

An historical agreement between Kāi Tahu and DOC that allows time for rūnaka and whānau to establish mātaimai reserves and taiāpure prior to Marine Reserves being established was recognised positively by Kāi Tahu.

The Kāi Tahu position on any MPA network is influenced by the position of each papatipu rūnaka in their rohe moana. Historically hard-won gains to recognise and provide for customary fishing rights of manawhenua are not held lightly or easily relinquished. There is also the belief that one generation should not deny opportunities to the next.

The representation of Kāi Tahu on the Forum, which increased from the originally proposed two people to three full representatives plus three alternates¹²², was an essential element to ensure that Kāi Tahu interests were equitably addressed. Kāi Tahu are seeking to have customary use reconsidered in the 25-year generational review process to leave that door open for future generations.

Any decision to have a mātaimai reserve amended to meet the protection standard as a Type 2 MPA is the prerogative of the individual rūnaka.

2.3.4 Effects on existing users

The proponents of Network 2 consider that the distribution of catch of kōura papatea (rock lobster) in the Forum region that was provided by MPI is inaccurate and so recommend that when decisions are made around the implementation of MPAs, a better understanding of the likely displacement and value of catch is obtained. For example, based on discussions with commercial fishers, Network 2 proponents estimate that up to 25% of the CRA7 catch is taken from D1 rather than the presumed 15.5%. In comparison, the estimated 5.8% of catch taken from D2, whilst still impacting on fishers, is significantly less than this.

Where MPAs displace fishing activity, Network 2 proponents are of the view that considered and reasonable steps must be taken to ensure that the displaced catch does not threaten the sustainability of surrounding fisheries or compromise the effective operation of New Zealand’s fisheries management regime. Network 2 seeks to strike a balance between the creation of robust MPAs while realistically considering impacts on local industries and individuals.

Network 2 proponents consider that a rebalancing of the fisheries system by the Crown should include both:

- An appropriate fisheries management response to remove the displaced catch from the fishery (i.e. a reduction in catch limits that is equivalent to the displaced catch); and

¹²² The alternate for South Canterbury, the late Pauline Reid, passed away in the first year of the Forum (2014).

- An appropriate market-based response to rebalance the economic incentives for the effective operation of the Quota Management System by ensuring that affected quota owners/operators are no worse off.

Kāi Tahu consider that rebalancing also needs to take into account impacts on future mātaihai reserve applications and manawhenua rights to take fish and manage their fisheries now and into the future. Failure to take into account these impacts is inconsistent with Treaty settlements.

2.3.4.1 RECREATIONAL FISHING

Network 2 is supported by the submissions of a significant number of recreational fishers.¹²³ This network retains a high level of access compared to the status quo, whilst acknowledging the need to protect certain habitats by either establishing a Marine Reserve or drafting fisheries regulations to exclude some commercial fishing methods. In designing this network, the impact of the displacement of commercial fishing on recreational fishing was a significant consideration. It is crucial that serial depletion of important target species does not occur as a result of the relocation of commercial fishing due to excessive closures. Such excessive closures can force fishers into fisheries that have reasonably discrete areas (e.g. mako (school shark and rig)), which can impact on their sustainability. Network 2 ensures that the risk of such commercial shifts into areas that are frequented by recreational fishers is minimised.

Numerous fishing method restrictions and recreational bag limits are currently in place under the Fisheries Act to manage the recreational sector. Consequently, Network 2 proponents consider it unnecessary to further impact on this sector by implementing MPAs that seek to exclude all fishing from many of the frequented areas. These areas not only support the recreational fishing experience but are close to shore, making them accessible to the many fishers who do not have the means to go further offshore.

Formal recreational fishing clubs and a significant number of recreational fishers supported Network 2 in their submissions on the proviso that scientific study is undertaken in Marine Reserves at the proposed sites to show the impact and improvement that results from closures. The consensus opinion from this sector was that recreational and commercial fishing is not the primary cause of habitat / species loss or degradation, and that the other significant factors involved will not be mitigated by restricting fishing access.

2.3.4.2 COMMERCIAL FISHING

An extensive system of restrictions currently impacts on the commercial fishing industry in New Zealand. These restrictions (see fishing restrictions maps, Figure 2-13 to Figure 2-18) include widespread prohibitions on Danish seining, trolling and set netting along the entire coast of the region. In addition, significant regulatory and voluntary restrictions on commercial shellfish harvesting, trawling and purse seining are in place to manage the impacts of commercial fishing. In the opinion of the Network 2 proponents, it is crucial that the Minister takes these restrictions into account when assessing a) the level of existing protection of marine biodiversity from fishing-related threats; and b) the impact of new MPAs on existing fishing activity in the region.

¹²³ This included 739 pro forma submissions as well as individual submissions from clubs and individuals.

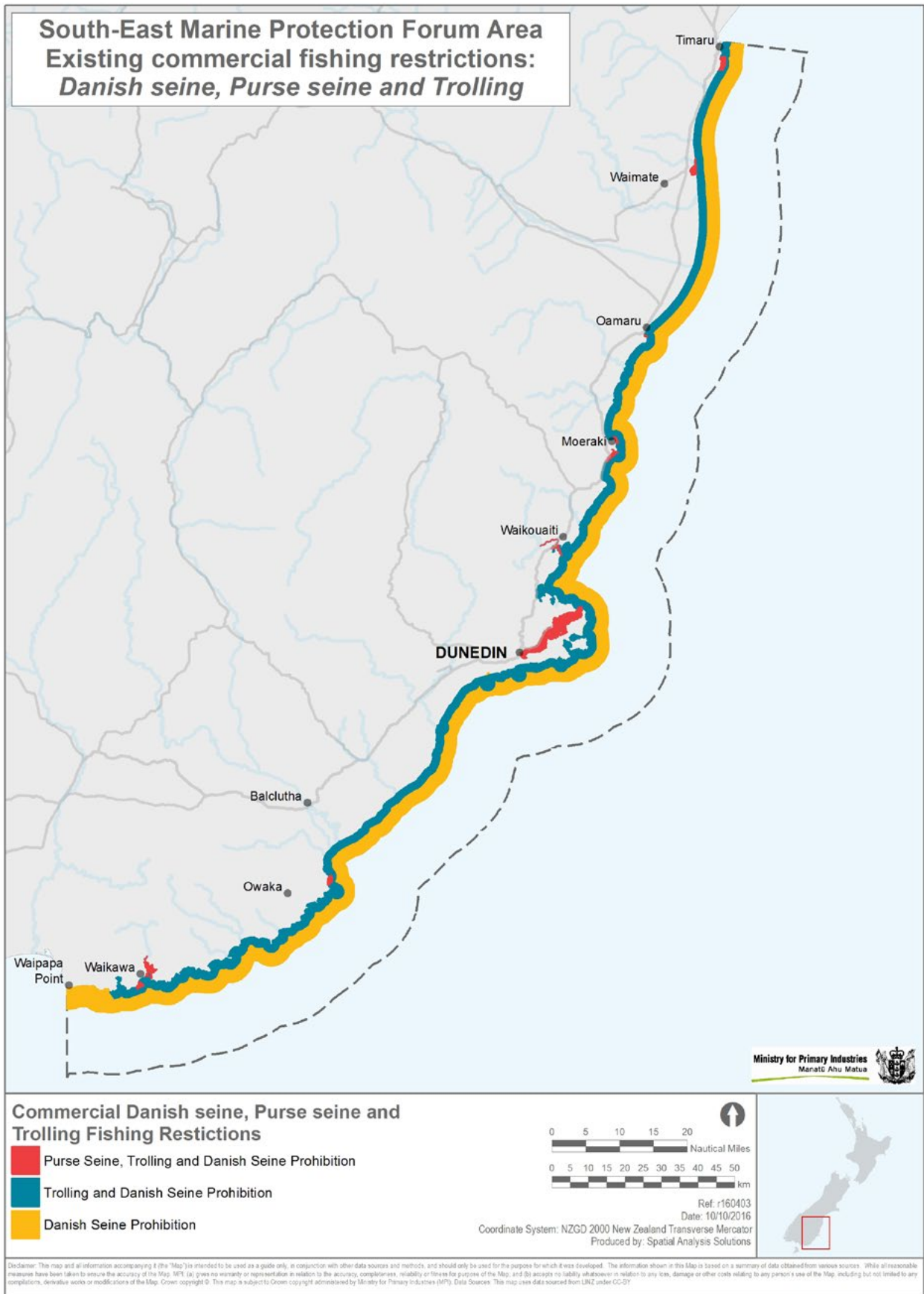


Figure 2-13: Commercial Danish seine, purse seine and trolling fishing restrictions

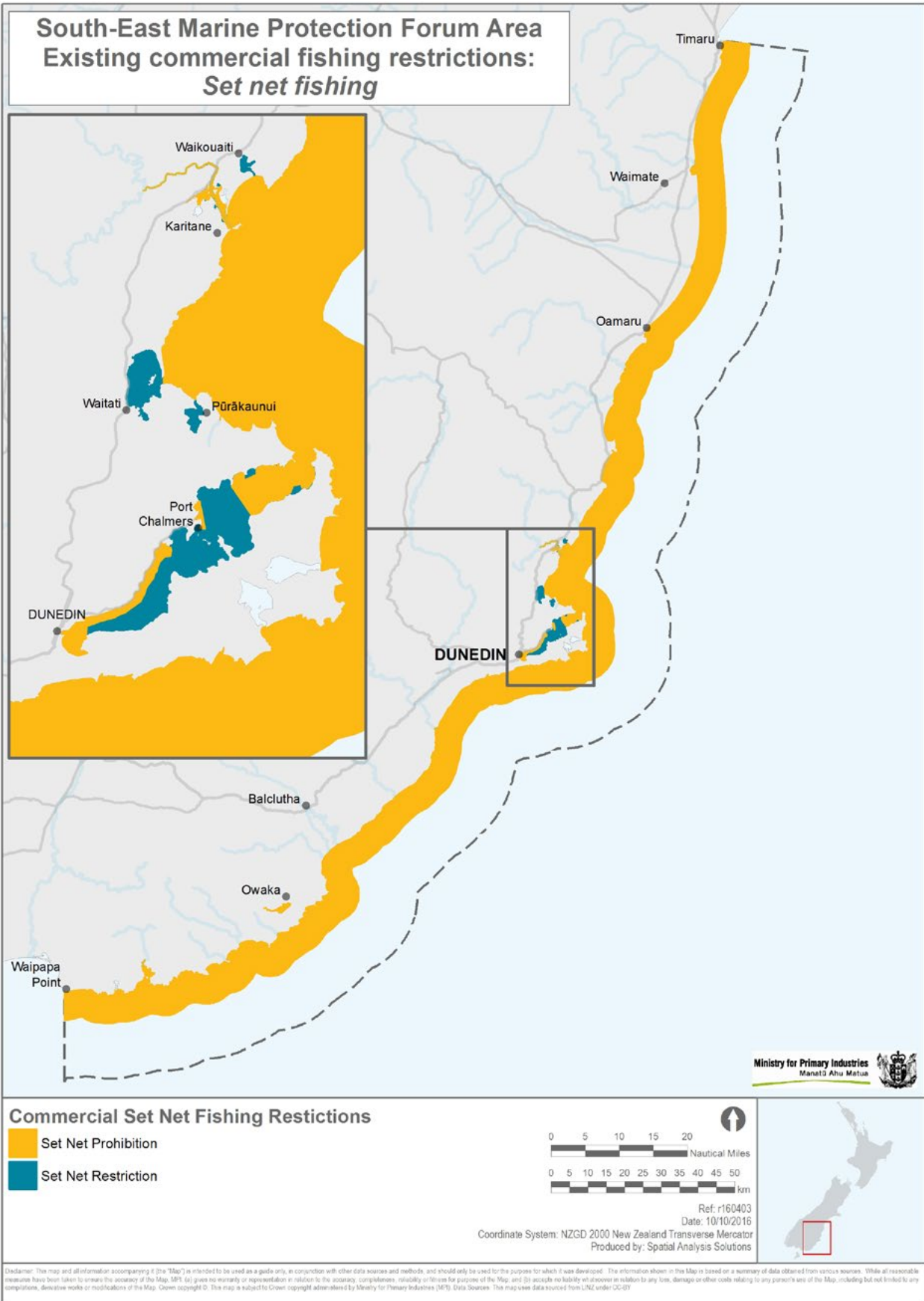


Figure 2-14: Commercial set net fishing restrictions

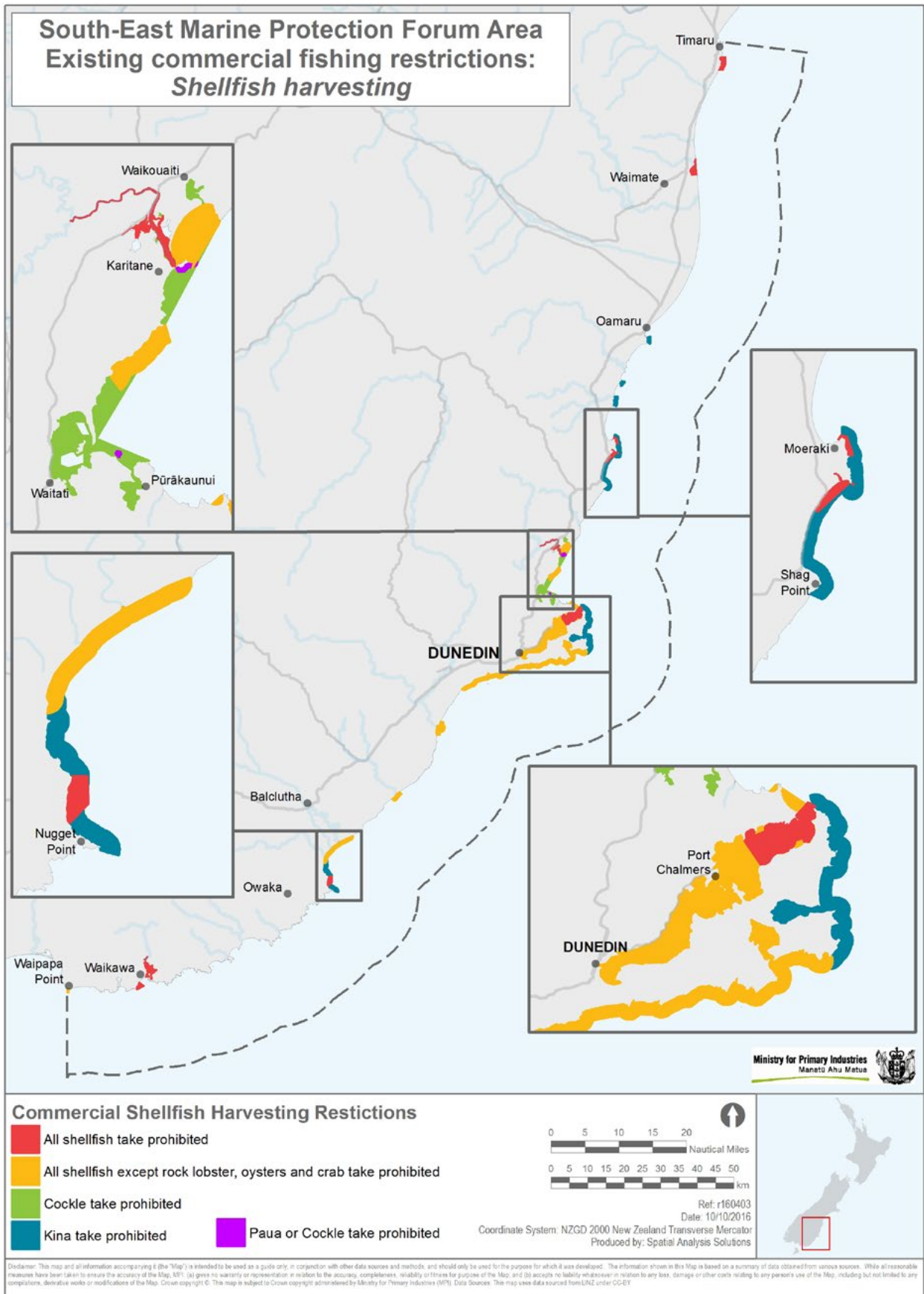


Figure 2-15: Commercial shellfish harvesting restrictions

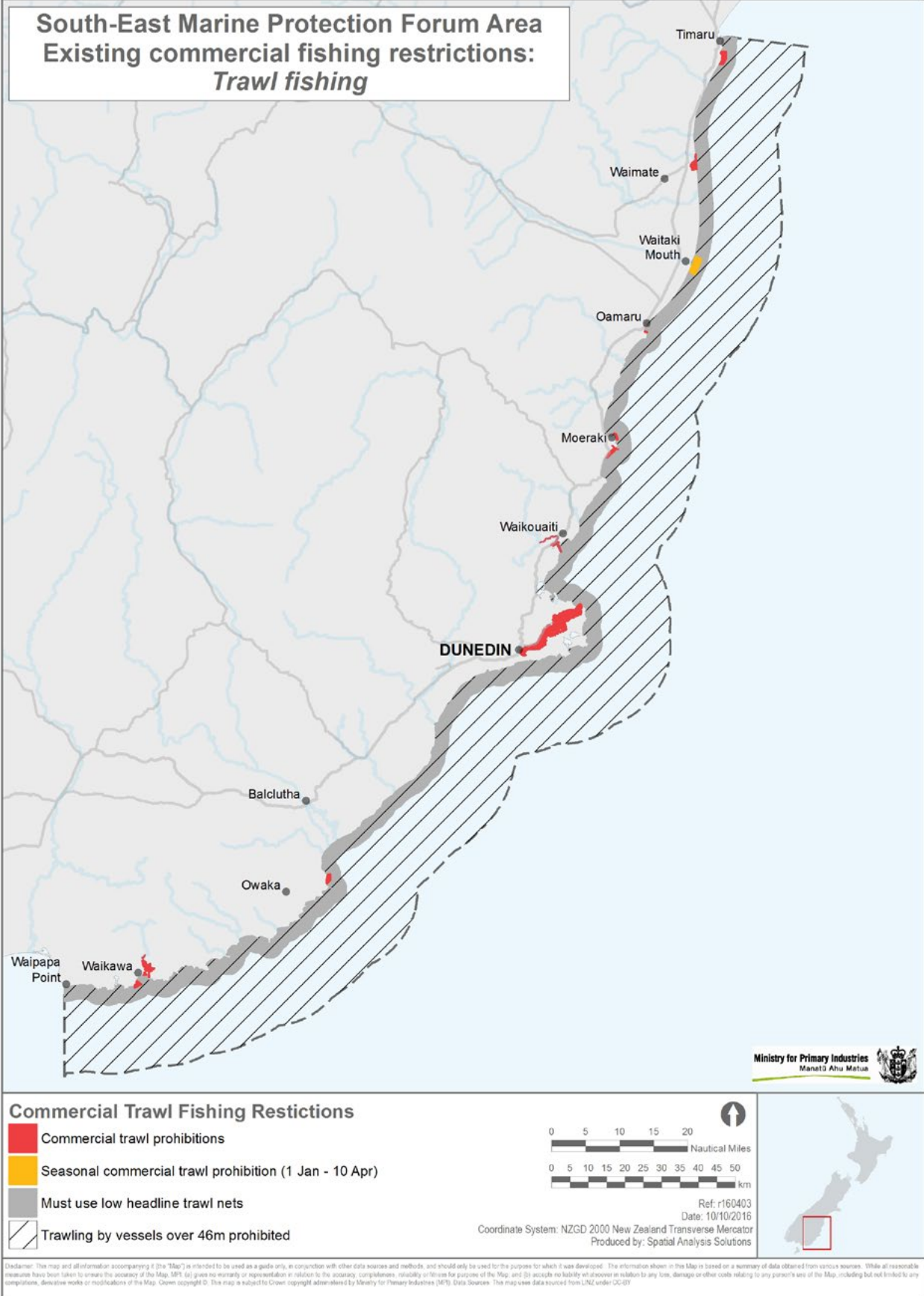


Figure 2-16: Commercial trawl fishing restrictions

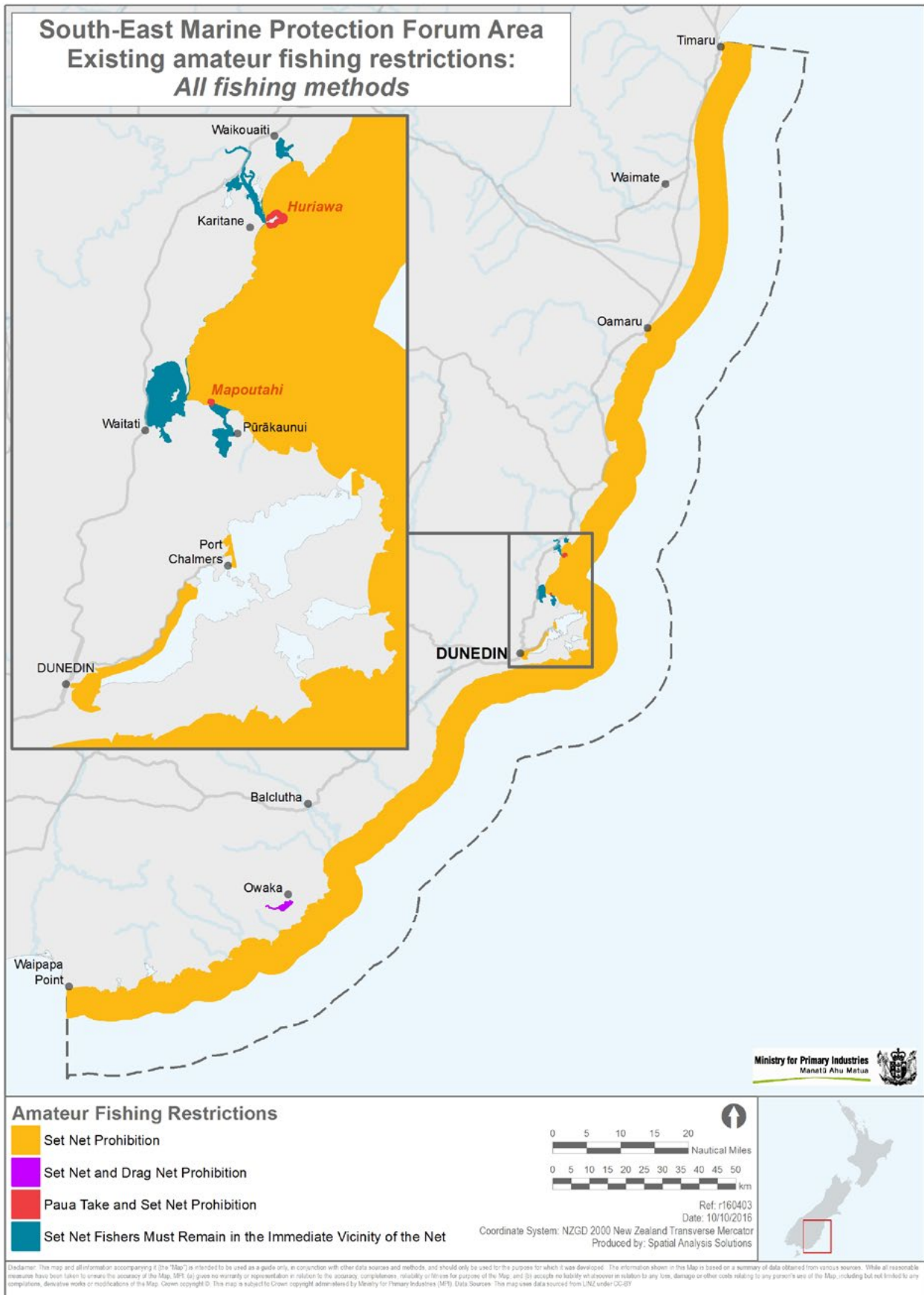


Figure 2-17: Amateur fishing restrictions

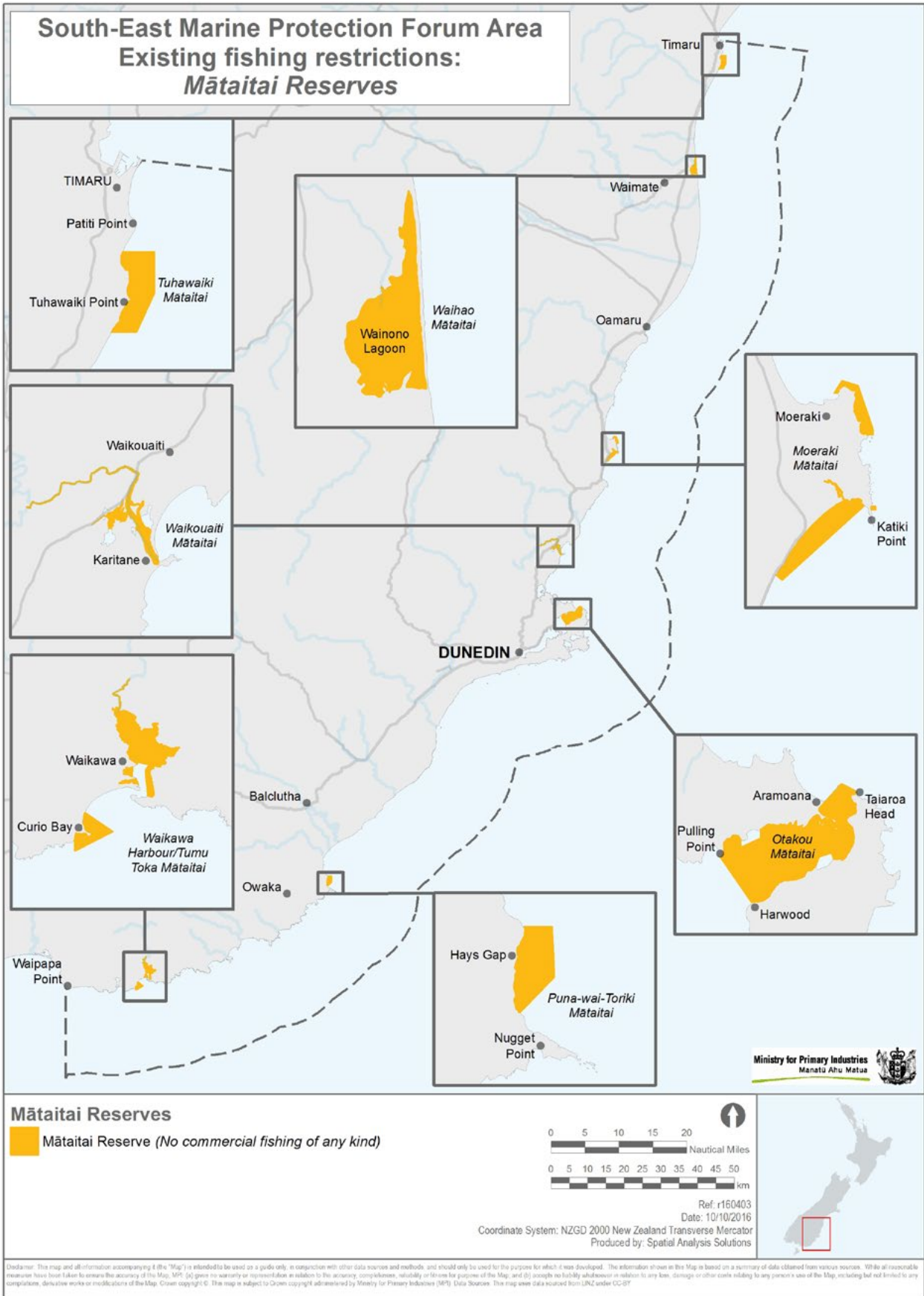


Figure 2-18: Mātaitai reserves

Table 2-10 shows the relative potential effect of displacement on commercial fisheries in the proposed sites within Network 2. Fishery displacement is shown as the percentage of the catch for a particular fishery that was presumed to have been caught within these sites (2007–2015). Therefore, it does not demonstrate an actual impact on the fishery, as multiple additional factors would need to be considered including movement of the target species, seasonal variation in catchability and the number of fishers that have access to the annual catch entitlement (which can vary by region and quota ownership).

MPI has expressed more confidence in data mapped for bottom longlining, bottom trawling, dahn lining, Danish seining, midwater trawling, purse seining, jigging and set netting, as these methods are reported and mapped using coordinates. By contrast, MPI has less confidence in data mapped for other methods (dredging, hand gathering, hand lining, potting and trolling), which are mapped by statistical area.

Table 2-10: Commercial fishery displacement for Network 2

Displacement relates to the amount of effort/catch that has occurred at the sites within each network during the fishing years 2007/08 to 2015/16 that would be displaced by the proposals. Percentages represent the proportion of displacement based on the Forum region (as opposed to the Quota Management Area). Source: Department of Conservation and Ministry for Primary Industries.

Fishery	Potential fishery displacement (%)
Danish seine	1.8
Dive – pāua	0.5
Jig – squid	2.1
Line (bottom longline and dahn line)	2.8
Net – elephant fish	0
Net – other	1.1
Net – rig	1.4
Net – school shark	0.8
Pot – blue cod	1.6
Pot – crayfish	5.8
Trawl – flatfish	0.2
Trawl – gurnard	0.9
Trawl – other	0.4
Trawl – red cod	0.4
Trawl – tarakihi	0.5

Catch intensity

The trawl and set net intensity maps generated in SeaSketch (see Figure 2-7 and Figure 2-8) do not fully reflect the importance of the spatial area (fishery) in which a species can be caught, as they combine the fishing intensity for multiple target fisheries. A better understanding can be gained by examining the species-specific setnet fishing intensity maps for mako (rig and school shark) and mako repe (elephant fish); and the species-specific trawl fishing intensity maps for hoka (red cod), kumukumu (gurnard *Chelidonichthys cuculus*) and pātiki (flatfish).

Note: The maps referred to in this section include potentially commercially sensitive information. They are not provided in the public version of this recommendations report, but are provided to the Ministers as supplementary information. The maps include:

- Commercial fishing intensity for the rig set net fishery
- Commercial fishing intensity for the school shark set net fishery
- Commercial fishing intensity for the elephant fish set net fishery
- Commercial fishing intensity for the red cod trawl fishery
- Commercial fishing intensity for the gurnard trawl fishery
- Commercial fishing intensity for the flatfish trawl fishery.

These maps show that the majority of the catch within each fishery is taken from very discrete areas. Therefore, reducing the catch through the exclusion of either set netting or trawling will have a significant impact on the fishers' ability to catch their target species in these localised areas and consequently displace those fishers to other areas. However, their ability to operate in other areas will depend on the costs associated with having to travel further, the ability to travel to a different area and whether they are able to transport their fish to another processor. Fishers rely on certain areas to target particular species, which vary depending on the target species and the method that is used to catch them, which in most cases is driven by the behaviour of the fish and the benthic habitat type.

As an example, Site G2 is an area of high-intensity effort for the mako (school shark) set net fishery and so the fishers who target this species are reliant on this area. Therefore, to retain access to this important fishery, it is proposed that Site G2 is made a Type 2 MPA, in which only bottom-impacting methods such as bottom trawling, Danish seining and dredging are restricted.

Similarly, the area located beyond the mātaimai reserve and south of Site A2 (outside the voluntary 1 NM closure) is an important pātiki (flatfish) fishery to the local Timaru fishers, in which the majority of the effort is located. Therefore, this area has been avoided by the proponents of Network 2.

2.3.4.3 CUMULATIVE EFFECTS

The proponents of Network 2 ask that the Ministers take into account existing closures when assessing the current levels of protection in the Forum region.

Consideration is rarely given to the cumulative impacts caused by spatial closures. Typically, spatial closures are assessed on a case-by-case basis (including the impacts on users) rather than considering the cumulative impacts in tandem with other closures on a broader scale. The current proposals for MPA closures are being assessed within a specific biogeographic region and do not consider the closures and restrictions that are already in place in adjacent biogeographic regions or fisheries management areas.

A number of fisheries restrictions are already in place within a number of quota management areas (Figure 2-13 to Figure 2-18). These closures have already had cumulative impacts through the displacement of fishing effort.

2.3.4.4 TOURISM

A small number of sea-based tourism opportunities have previously been trialled in the area south of the Otago Peninsula, but as yet very few of these have become established. There are limited launching facilities available in the area around Dunedin, particularly for vessels the size of those required for tourism ventures. Therefore, any such vessel that intends to access the offshore areas is likely to need to launch from either the Otago Harbour or Taieri Mouth (which will require crossing the difficult-to-navigate Taieri Mouth bar).

2.4 THE PROPOSED NETWORK SITES

2.4.1 Introduction

This section presents each site that has been included in one or both of the proposed networks. Where a site occurs in both networks, information common to both networks is presented in a single cell, information that differs is presented side by side for ease of comparison.

For each site, maps showing the general location and relation to consultation areas are given up front. In addition, at the end of each section, a map showing the habitats included, and another showing the detailed location of the site (including coordinates and distances) are provided.

The size, shape and boundaries of each site are mapped and included on an inset location map to aid understanding of where these sites are in relation to geographical landmarks. Additional maps show the habitat types that are protected within each MPA.

The narrative records why the site was chosen and, where applicable, why the boundaries have changed from those provided during the consultation phase. In addition, submitters' remarks concerning the site are summarised.

The analysis of each site describes:

- Physical parameters of the site
- Management tools – what is recommended and why
- How the site meets the protection standard
- Cultural importance of the site
- Adverse impacts on users
- Accessibility
- Benefits
- Social and economic impacts.

Appendix 1 provides more in-depth site data, including habitat and fisheries data, for each site.

2.4.1.1 CULTURAL SIGNIFICANCE

Te Rūnanga o Ngāi Tahu have the responsibility to administer and protect Treaty settlement rights and assets.

The Ngāi Tahu Claims Settlement Act created a Statutory Acknowledgement for the Otago coastal marine area known as Te Tai o Arai Te Uru (see Appendix 6.2). This area intersects with Sites B1 and B2 through to Site Q1, and also includes a large part of Site T1. The Te Tai-o-Arai-Te-Uru Statutory Acknowledgement recognises the ancestral traditions and places, tribal identity, continuity between generations, rich kaimoana and sea fishery, and tribal seafaring traditions.

Traditional fishing villages were located along this coast and are evident in the archaeological evidence that remains. The coastline supported numerous tauraka waka and this coast remains an important source of kaimoana and fishery for Kāi Tahu customary, recreational and commercial fishers.

The Waitaki River is a singularly important tribal taoka and an essential element of Kāi Tahu tribal identity. This river provided and continues to provide many forms of mahika kai, including migrating tuna (eel), yellow-eyed mullet (*Aldrichetta forsteri*) and black flounder (*Rhombosolea retiarii*). Similarly, the Mata-au (Clutha River) is an important tribal taoka that provides a diverse range of mahika kai, customary values and rich traditional associations at and near its delta. The Waitaki River and Mata-au (Clutha River) are recognised in the Ngāi Tahu Claims Settlement Act 1998 by Statutory Acknowledgement.¹²⁴

The loss of access to land and freshwater-based mahika kai transferred the reliance on customary resources to the fisheries lying adjacent to Māori lands, which were retained by manawhenua. The practice of customary use is an important function in the maintenance and transfer of mātauraka between generations. It is a source of identity and mana, physically sustaining whānau and hapū.

Modern means of accessing the fisheries have individualised the exercising of customary use, which is best recognised in the submissions of those who raise the issue of loss of customary rights and erosion of Treaty rights.

The custom of providing manaakitaka to visitors is embellished by the provision of traditional foods, embedding important cultural characteristics that are reliant on continued access to customary fisheries and resources. Therefore, any restriction of customary fishery resources should be counter-balanced by the customary right holders maintaining a role in the future governance of any reserves. This counter-balance may also be complemented by a generational review of each reserve.

Marine Reserves alienate Kāi Tahu from their traditional fisheries and this effect spans across generations.

It is worth noting that an application for recognition of customary marine title that extends along the entire coast covered by the Forum region has been lodged by Te Rūnanga o Ngāi Tahu under the Marine and Coastal Area (Takutai Moana) Act 2011.

The iwi authority Te Rūnanga o Ngāi Tahu has the responsibility to administer and ensure that Treaty settlement rights and responsibilities are maintained and adhered to.

2.4.1.2 COMMERCIAL FISHING INFORMATION

The commercial fishing information that is included in this recommendations report is based on information provided by MPI. When considering this information, it is important to note that there is uncertainty about the actual impacts (positive or negative) that the proposed MPAs will have on commercial fishing. Although the information presented is based on the best estimates available, the spatial extent over which the catches of many species are reported means that we cannot be sure how much catch is taken in a specific area or the extent of displacement of fishing effort. For each site, information is provided to highlight the main potential impacts on commercial fishing.

The commercial representatives on the Forum have raised concerns about the accuracy of some of the area-based information provided by MPI. For example, they suggest that MPI has overestimated the numbers of fishers using Sites A1 and A2, and also consider that the displacement figures for kōura papatea (rock lobster) fisheries, particularly at Site D1,

¹²⁴ Schedule 72, Statutory Acknowledgement for the Waitaki River, Ngāi Tahu Claims Settlement Act 1998; and Schedule 40, Statutory Acknowledgement for the Mata-au (Clutha River), Ngāi Tahu Claims Settlement Act 1998.

underestimate the amount of catch. MPI has acknowledged that there are limitations to the data because of the way in which catch is reported and the assumptions that are made when it is mapped. MPI has advised that the counts of fishers using each fishing method are totals over nine years of records. For fishing methods like potting that report based on statistical areas, the counts relate to the number of permit holders operating in the wider statistical area.

The number of individual events and all catch estimates are annual averages. Consequently, MPI has also noted that before any MPA is implemented, consultation with fishers will be important to understand the actual impacts.

Limited economic information is also provided as an indicator of the relative impacts of the different proposed sites in each of the networks. For consistency, this is expressed as an estimated export value. This is not intended as a full assessment of the economic value of displaced catch as, for example, it does not include the wider economic benefits of commercial fishing, such as the quota value, land-based processing infrastructure and retail marketing, vessel investment, and employment.

The export value should also not be read as a statement of the expected reduction in economic value, particularly since the displaced catch may or may not be able to be taken elsewhere, and the costs of doing so may change. Furthermore, this information is also subject to the same limitations as the catch data on which it is based.

Due to these limitations, the Forum is including the commercial fishing information in this recommendations report only as an indicator of the relative potential impacts of the proposed sites and networks. The information is not intended to show the absolute impacts.

For more detailed information, including how values were calculated, see Appendix 1.2.

2.4.1.3 CONCESSIONS AND RESOURCE CONSENTS

The Forum recognises that there are a number of active concessions, permits and resource consents on the south-east coast, which will be impacted by the implementation of a network of MPAs. The implications for these affected parties will need to be assessed and potentially redressed when the chosen network is implemented.

2.4.2 Tuhawaiki – Sites A1 & A2 (Type 2)

2.4.2.1 OVERVIEW

Site A is included in both networks, but there are differences in its size and proposed protection tools.

Site A1 contains two extensions to the original Site A that was included in the Consultation Document. An extension southward partially overlaps an area that is voluntarily closed to bottom trawling by the commercial sector to protect mako repe (elephant fish) egg cases and there is an approximately 6 km extension of the seaward boundary in the north.

Site A2 is identical to the site that was consulted on.

Site A2 adjoins the Tuhawaiki Mātaitai reserve while Site A1 surrounds it (as shown in Figure 2-19).

2.4.2.2 WHY THIS SITE HAS BEEN RECOMMENDED

The inshore areas of Site A currently have a voluntary trawl ban in recognition of the importance of the area as habitat for mako (school shark) pupping and mako repe (elephant fish) egg cases. The proposed restrictions would provide enhanced regulatory protection for the habitat supporting these resources and would also complement the mātaitai reserve, where commercial fishing is already prohibited.

Both Sites A1 and A2 are particularly significant for pahu (Hector’s dolphin), kororā (little penguin) and hoiho (yellow-eyed penguin, particularly juveniles in their pelagic phase), as well as a range of sessile invertebrates. However, regulatory protection measures have been in place since 2008 to restrict set net fishing out to 4 NM.

This site also potentially adds to the representation of four habitat types, which are shown in Figure 2-20 and Figure 2-21.

Site A2 was proposed to enhance the mātaitai reserve, and offer a buffer and extension along the coastline.

2.4.2.3 WHAT SUBMITTERS SAID

The majority of submitters supported Site A as contained in the Consultation Document. However, the offshore and southern extensions of Site A1 were not included in the Consultation Document and so indications of support for or opposition to these extensions are not available.

Several science submitters called for an extension to the site as they saw it as being too small, and also supported the prohibition of ‘kontiki’ rigs and lines with more than five hooks within the proposed area.

Table 2-11 shows the positions of pro forma and individual submitters in relation to Site A.

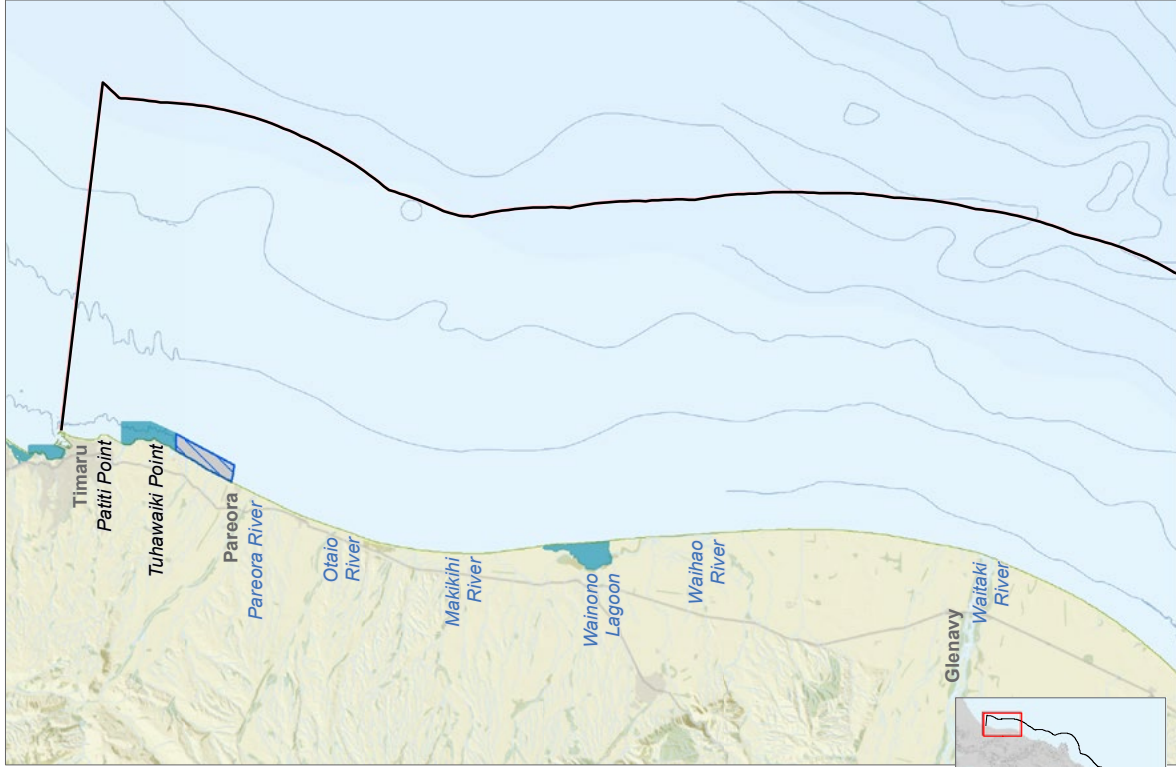
Table 2-11: Summary of submissions for Site A

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

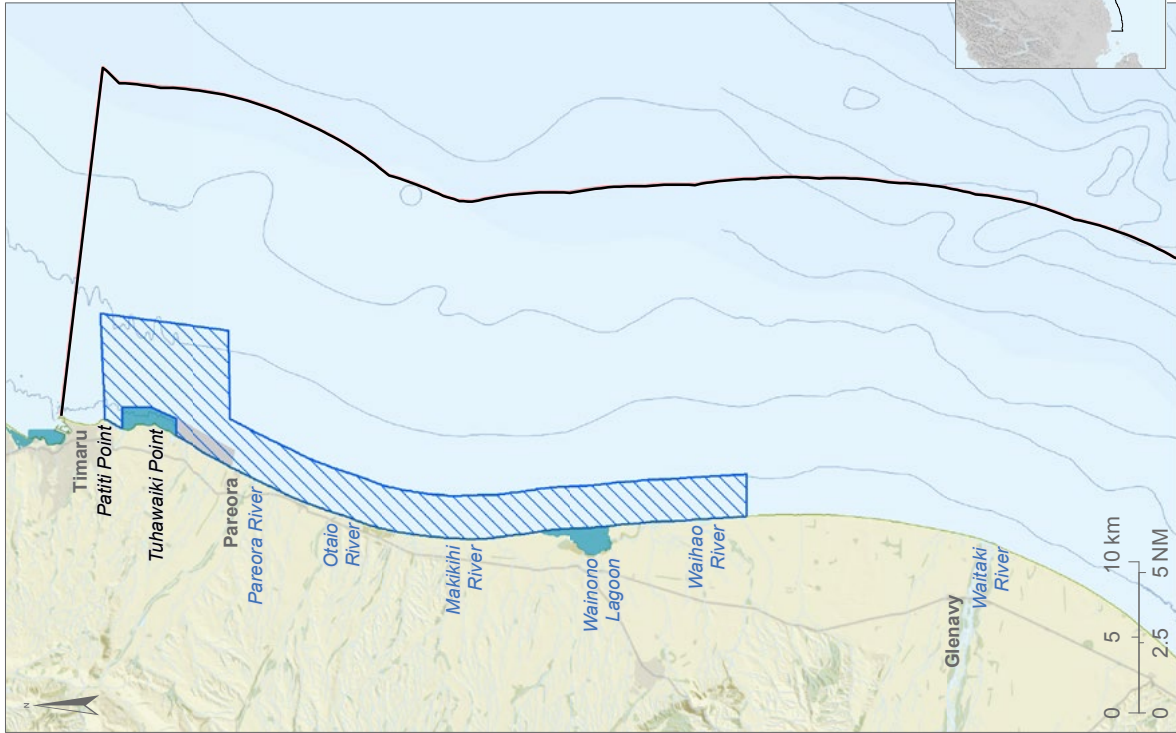
Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1961	0	0
Individual	280	20	23
Total	2241	20	23

Figure 2-19:
Site A - Tuhawaiki
overview map
 Two variations of this site are shown: Network 1, Site A1; and Network 2, Site A2.






Network 2, Site A2



Network 1, Site A1



Management areas

-  Marine Reserve
-  Type 2 MPA
-  Consultation area
-  Mātaaitai
-  Forum region

2.4.2.4 ANALYSIS OF SITES A1 & A2

Table 2-12: Site A1 and A2 analysis – meeting the Policy requirements

	Site A1 Tuhawaiki – Network 1	Site A2 Tuhawaiki – Network 2
Description	<p>The proposed Type 2 MPA extends 40 km alongshore and up to approximately 7 km offshore (at the northern extension). The southward extension extends approximately 2.8 km (or 1.5 NM) offshore.</p> <p>Network 1 proponents considered that the original site proposed during the consultation process was too small to be viable and contribute to the network. It was therefore extended to increase its viability and contribute to the MPA Policy objective.</p>	<p>The proposed Type 2 MPA extends 4.4 km (2.4 NM) alongshore and up to 1.1 km (0.59 NM) offshore, encompassing approximately 4.4 km².</p> <p>Network 2 proponents contend that the combined area covered by the mātaimitai reserve and Site A2 is reasonably viable and provides additional habitats within the network.</p>
Relationship to Consultation Document	<p>This option was not consulted on, but is derived from consultation on Site A (shown in grey shade in Figure 2-19). It was extended offshore and to the south in partial fulfilment of what was requested by science submitters.</p>	<p>This option has the same boundaries that were consulted on. The majority of submitters agreed with the current size and extent of this area.</p>
Recommended management tool(s) / protection standard	<p>A Type 2 MPA that includes the following prohibitions:</p> <ul style="list-style-type: none"> • Bottom trawling • Dredging • Danish seining and set netting (these are already restricted under specific fisheries regulations) • Commercial long lining • Mid-water trawling • Five hook limit for line fishing • Bottom disturbance and seismic testing associated with any activity. <p>The fisheries restrictions would not restrict potting or recreational fishing, with the recommended exception of recreational fishing with lines (including kontiki) of more than five hooks.</p> <p>See Section 2.2.3.4 (viability heading) for details on the recommended protection tools.</p> <p>Network 1 proponents consider that an extension to the originally proposed site is necessary because the small size of the original proposal makes it unviable in terms of meeting the protection standard.</p> <p>The offshore extension means that the MPA is more likely to be viable and meet the protection standard in terms of providing ‘... for the maintenance and recovery at the site of: ... (b) ecological systems, natural species composition (including all life-history stages), and trophic linkages ...’.</p>	<p>A Type 2 MPA that includes the following prohibitions:</p> <ul style="list-style-type: none"> • Bottom trawling • Dredging • Danish seining and set netting (these are already restricted under specific fisheries regulations) • Commercial long lining • Five hook limit for line fishing • Bottom disturbance and seismic testing associated with any activity. <p>Set netting is already restricted by the 4 NM set net closure. There is no mid-water trawling in this area.</p> <p>Network 2 proponents contend that when considering the size of some other proposed sites in Network 1, Site A2 is comparable (and in some instances larger) in size and therefore both justifiable and viable.</p> <p>Network 2 proponents note that there is a voluntary closure to all bottom trawling down to the Waitaki River and out to 1 NM offshore that has been imposed by commercial fishers to protect the egg cases of mako repe (elephant fish), which are an important resource in the south-east region.</p>

	Site A1 Tuhawaiki – Network 1	Site A2 Tuhawaiki – Network 2
Representative (sufficient extent and quality to meet the protection standard) ¹²⁵	<p>Network 1 proponents consider that Site A1 includes four habitat types that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Gravel Beach: 57.4% of this habitat type within the region. Representative of this habitat type. • Moderate Shallow Mud: 33.4% of this habitat type within the region. Represents the biodiversity of the nearshore component of this habitat type. • Moderate Shallow Sand: 9.8% of this habitat type within the region. Represents the northern extent of this habitat type. • Moderate Shallow Gravel: 3.6% of this habitat type within the region. Represents the shallow component of this habitat type. <p>Site A1 also contains two further habitat types that, while present, are unlikely to contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Shallow Reef: 2.3% of this habitat type within the region. Does not contribute to representation as the proposed restrictions are unlikely to provide adequate protection for reef habitats. • Moderate Intertidal Reef: 0.1% of this habitat type within the region. Does not contribute to representation of this habitat type. 	<p>Network 2 proponents consider that Site A2 includes four habitat types that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Gravel Beach: 3.8% of this habitat type within the region. • Moderate Shallow Gravel: 0.01% of this habitat type within the region. • Moderate Shallow Reef: 0.5% of this habitat type within the region. • Moderate Shallow Sand: 0.5% of this habitat type within the region.
Kāi Tahu cultural assessment ¹²⁶	<p>A significant localised fishery exists at Tuhawaiki Point, which is centred on two reefs in that area and is incorporated by the mātaítai reserve at Tuhawaiki Point.</p> <p>Two traditional pā once stood to the north of Sites A1 and A2 at Patiti Point. Tuhawaiki Point was named after the southern Chief Tuhawaiki who drowned there in 1844.</p> <p>The southern end of Site A1 extends past Wainono Lagoon and to the Waihao Māori Reserve, which includes areas of strong traditional freshwater customary values including migratory fish species.</p> <p>Kaitiakitaka</p> <p>The kaitiaki for the customary rights located in the coastal area covered by Sites A1 and A2 is undertaken by the whānau and hapū of Kāti Huirapa and Kāi Hateatea. Administration of the kaitiaki interest is undertaken by Te Rūnaka o Arowhenua for Site A2 and the northern section of Site A1, and Te Rūnanga o Waihao for the southern section of Site A1.</p> <p>Customary fisheries</p> <p>Customary fisheries are principally localised around the reefs that are included in the Tuhawaiki Mātaítai reserve.</p> <p>Māori Reserve lands and Fenton Reserves are located in the vicinity of Site A1 in proximity to the Waihao River mouth (The Box) and south of Wainono Lagoon, i.e. towards the southern end of Site A1.</p> <p>Whānau, hapū and fishers</p> <p>Te Rūnanga o Arowhenua administers a mātaítai at Tuhawaiki Point, which was established in 2016. Sites A1 and A2 surround or border this mātaítai reserve.</p>	

¹²⁵ See Appendix A1.1 for complete habitat data.

¹²⁶ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

	Site A1 Tuhawaiki – Network 1	Site A2 Tuhawaiki – Network 2
Adverse impacts on existing users	<p>Commercial fishing¹²⁷</p> <p>Set netting and Danish seining are already prohibited across most of Site A1. There is also a voluntary trawl ban in the area, which aims to protect mako repe (elephant fish) eggs and mako (school shark) pupping areas.</p> <p>Based on SeaSketch reporting, the top three fisheries that will be displaced by Site A1 are:</p> <ul style="list-style-type: none"> • Trawl – kumukumu (red gurnard): 11.2% • Trawl – hoka (red cod): 5.5% • Trawl – other: 4.3%. <p>Noting the limitations set out in Section 2.4.1, MPI estimates:</p> <ul style="list-style-type: none"> • The estimated export value of potentially displaced fisheries at \$436,000, based on a volume of 98,000 kg of fish. • Of this, the main displacement could occur in the trawl fisheries for: <ul style="list-style-type: none"> ◦ Pātiki (flatfish) – 20,000 kg, with an estimated export value of \$141,000 ◦ Mako repe (elephant fish) – 21,000 kg, with an estimated export value of \$109,000 ◦ Kumukumu (red gurnard) – 14,000 kg, with an estimated export value of \$98,000. • Thirty-one fishers may trawl within Site A1, with an average total of up to 643 trawl events at this site per year. However, MPI notes that the trawl fishing estimates for this site are likely overestimates due to the way in which inshore trawl fishing events have been mapped. • A total of 51 commercial fishers are thought to fish in this area or in the wider statistical area within which Site A1 is located. • Of the other commercial methods that would be restricted at Site A1: <ul style="list-style-type: none"> ◦ Seven fishers use bottom longlines or dahn lines ◦ Seven fishers use set nets ◦ Very few fishers use Danish seines, but there are an average of 117 Danish seine events per year that include Site A1 ◦ There is little or no dredging. 	<p>Commercial fishing</p> <p>Site A2 is not expected to have significant adverse effects on commercial fishing given its size. However, should it be extended offshore or to the south, it will have an impact on the mixed trawl fishery for kumukumu (red gurnard), pātiki (flatfish) and hoka (red cod) fish stocks; and the southerly extension will also impact on the bottom longlining area.</p> <p>A concession was proposed to restrict bottom longlining in Site A2 only but not in any extension to this site.</p> <p>Set netting and Danish seining are already prohibited in most of Site A2. There is also a voluntary trawl ban in the area, which aims to protect mako repe (elephant fish) eggs and mako (school shark) pupping areas.</p> <p>Based on SeaSketch reporting, the top three fisheries that will be displaced by Site A2 are:</p> <ul style="list-style-type: none"> • Trawl – kumukumu (red gurnard): 0.9% • Line¹²⁸ – 0.5% • Trawl – hoka (red cod): 0.4%. <p>Noting the limitations set out in Section 2.4.1, MPI estimates:</p> <ul style="list-style-type: none"> • The estimated export value of potentially displaced fisheries at \$32,000, based on a volume of 6,600 kg of fish. • Of this, the main displacement could occur in the trawl fisheries for: <ul style="list-style-type: none"> ◦ Pātiki (flatfish) – 1,300 kg, with an estimated export value of \$9,000 ◦ Mako repe (elephant fish) – 1,600 kg, with an estimated export value of \$8,500 ◦ Kumukumu (red gurnard) – 1,000 kg, with an estimated export value of \$7,000. • Nineteen fishers may trawl within Site A2, with an average total of up to 148 trawl events at this site per year. However, MPI notes that the trawl fishing estimates for this site are likely overestimates due to the way in which inshore trawl fishing events have been mapped. • A total of 30 commercial fishers are thought to fish in this area or in the wider statistical area within which Site A2 is located. • Of the other commercial fishing methods that would be restricted at Site A2: <ul style="list-style-type: none"> ◦ Six fishers use bottom longlines or dahn lines ◦ No fishers use Danish seines ◦ There is little or no dredging.

¹²⁷ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹²⁸ Bottom longline and dahn line.

	Site A1 Tuhawaiki – Network 1	Site A2 Tuhawaiki – Network 2
<i>Adverse impacts on existing users continued</i>	<p>Recreational fishing</p> <ul style="list-style-type: none"> • Most recreational fishing could continue under the proposed management of the area. 	<p>Recreational fishing</p> <ul style="list-style-type: none"> • The effect on recreational fishers will depend on restrictions to the use of kontiki and the number of hooks per line, as well as potential catch limit restrictions proposed in the future under a fisheries management process (given a small area has been proposed and most recreational fishing methods are still allowed for).
	<p>Resource consents</p> <p>A number of consents are currently active, including gravel extraction and discharges to the environment. The Forum has not assessed the adequacy of the conditions in these discharge consents.</p>	
Other impacts	<p>Accessibility</p> <p>Both Sites A1 and A2 are highly accessible and visible from both shore and boat.</p> <p>Benefits</p> <ul style="list-style-type: none"> • Educational opportunities • Potential to enhance mātaītai reserve • Potential incentive for scientific study • Potential for indirect tourism benefits • Intrinsic community benefits – civic pride, amenity enhancement • Synergy with current walkway development • Proximity to Timaru will encourage locals and visitors to access the MPA via the Jack’s Point walkway at the northern (city) end. 	

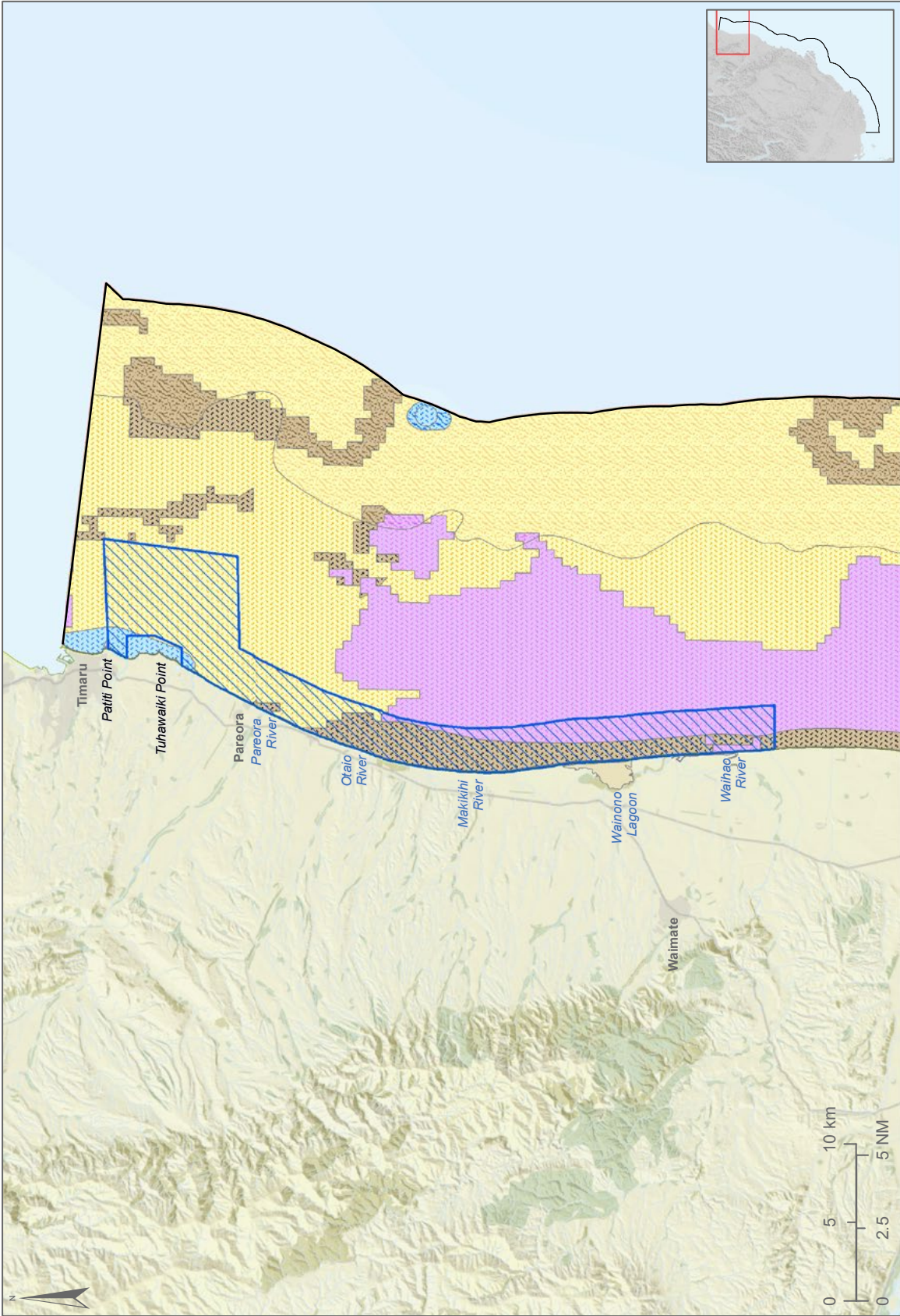


Figure 2-20: Broad-scale habitat map for Site A1 – Tuhawaiki

** For legend, see inside back cover.*

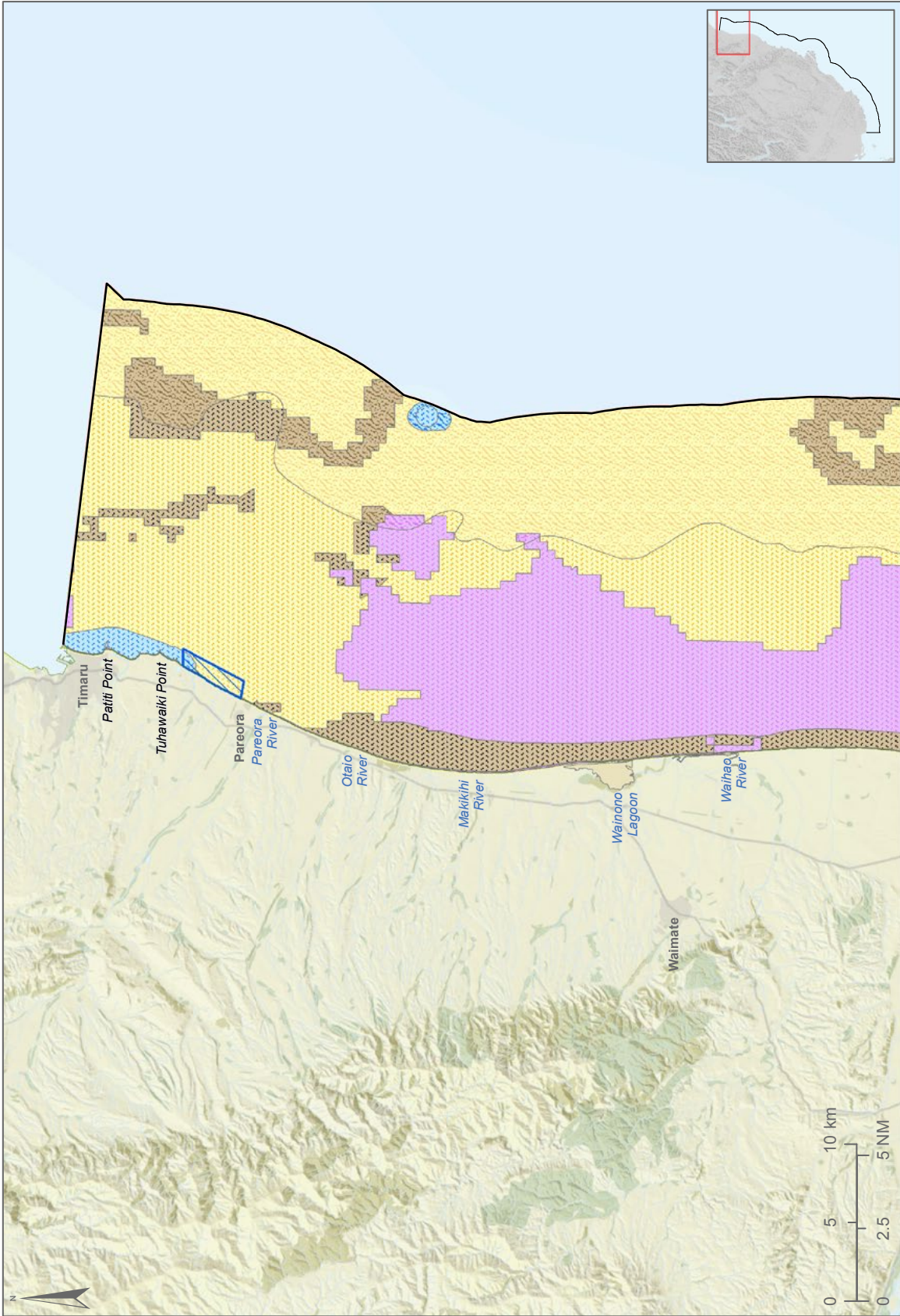
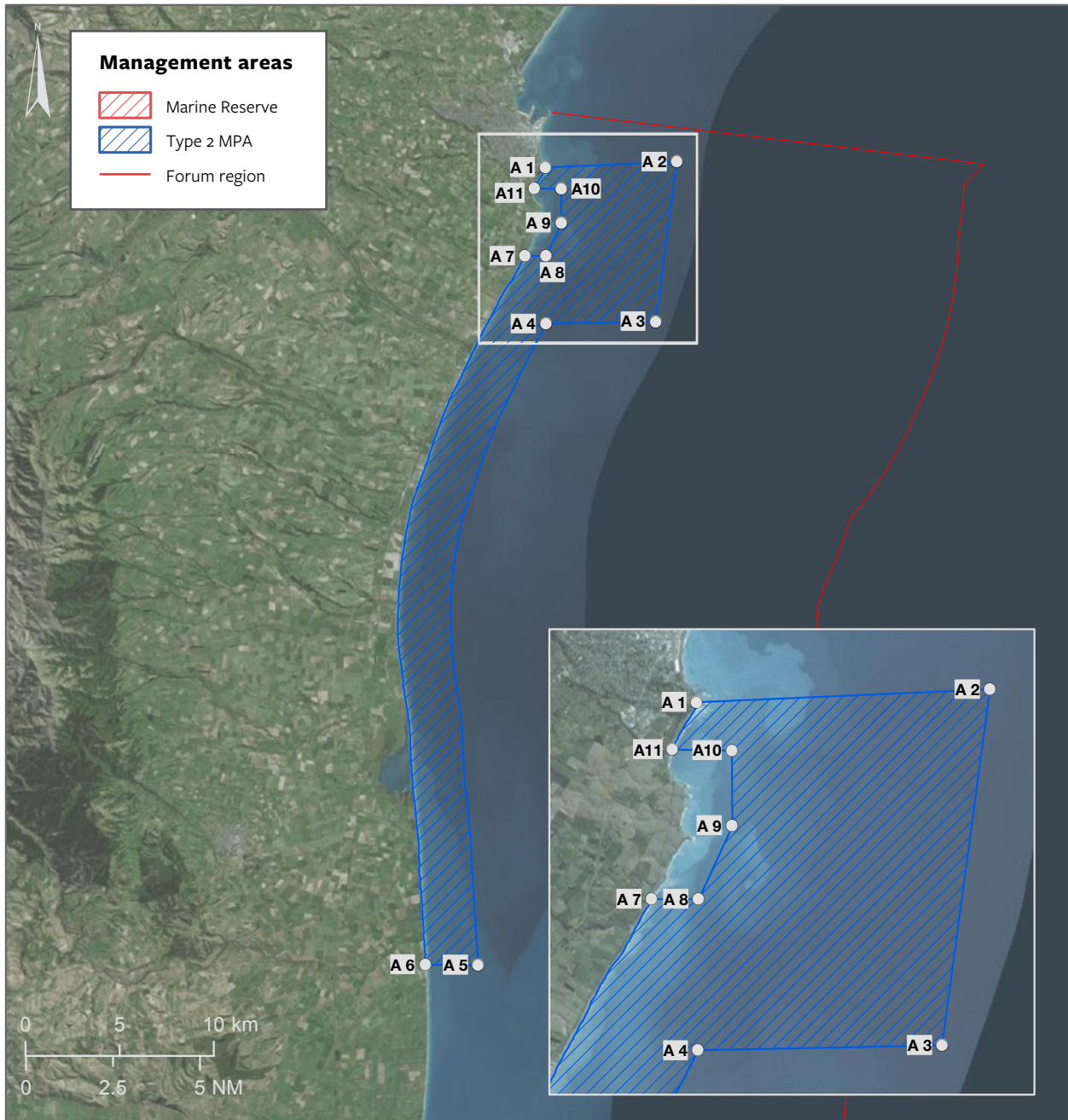


Figure 2-21: Broad-scale habitat map for Site A2 - Tuhawaiki

** For legend, see inside back cover.*

Figure 2-22: Location map for Site A1 – Tuhawaiki



Index to Boundary Points		
Vertices	Latitude	Longitude
A 1	44° 24.839' S	171° 15.907' E
A 2	44° 24.753' S	171° 21.186' E
A 3	44° 29.329' S	171° 20.197' E
A 4	44° 29.329' S	171° 15.800' E
A 5	44° 47.692' S	171° 12.514' E
A 6	44° 47.646' S	171° 10.387' E
A 7	44° 27.367' S	171° 15.017' E
A 8	44° 27.380' S	171° 15.860' E
A 9	44° 26.440' S	171° 16.490' E
A 10	44° 25.470' S	171° 16.520' E
A 11	44° 25.442' S	171° 15.452' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
A1-A2	7008	3.784
A2-A3	8574	4.630
A3-A4	5829	3.147
A4-A5	34282	18.511
A5-A6	2806	1.515
A7-A8	1119	0.604
A8-A9	1931	1.043
A9-A10	1797	0.970
A10-A11	1418	0.766

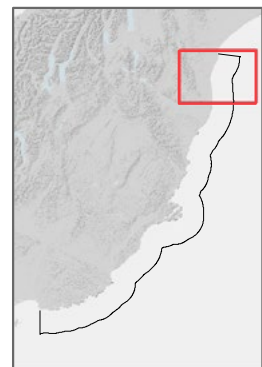


Figure 2-23: Location map for Site A2 - Tuhawaiki



Index to Boundary Points		
Vertices	Latitude	Longitude
A1	171° 15.017' E	44° 27.367' S
A2	171° 15.860' E	44° 27.380' S
A3	171° 14.235' E	44° 29.437' S
A4	171° 13.404' E	44° 29.312' S

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
A1 - A2	1119	0.604
A2 - A3	4376	2.363
A3 - A4	1126	0.608
A4 - A1	4203	2.269



2.4.3 Waitaki Coastal – Sites B1 & B2 (Marine Reserve)

2.4.3.1 OVERVIEW

Site B is included in both networks.

Network 1 incorporates an area that was not included during the consultation process, with the intention of improving the design by aligning the northern boundary with the southern boundary. In Network 1, Site B1 is adjacent to Site C1 – Waitaki Offshore, as shown in Figure 2-24 and Figure 2-29 (see Section 2.4.4).

Site B2 is the same size as was consulted on, excluding the extension (Figure 2-24b).

2.4.3.2 WHY THIS SITE HAS BEEN RECOMMENDED

The Waitaki River has a strong influence on the North Otago and South Canterbury coast, both in terms of freshwater inputs to the marine environment and the transportation of sediment from the land to the sea.

Reports from commercial fishers suggest that this area contains kelp beds on cobble habitats that are important for juvenile fish species and are regionally unique habitats (due, in part, to the influence of the Waitaki River mouth).

The unstudied macroalgal communities to the south of the river are likely unique in the region, and this MPA has been proposed to afford protection to these important biogenic habitats.

The Marine Reserve would represent gravel habitats of the North Otago / South Canterbury region that are not represented in any other proposed Marine Reserve.

Rhodolith beds (hard, calcified red algae), which are associated with high biodiversity value, are likely to be found in the cobble habitat in this area. In addition, some of the highest densities of squat lobsters have historically been found around the Waitaki River mouth, which represent an important food source for fish, marine mammals and birds. However, squat lobsters are now at a very low abundance compared with historic levels, which has an impact on trophic linkages.

The use of the area by seabirds indicates that it is likely to have important biodiversity values, though it is unknown which habitat types are there to support them. Neither option for a proposed Marine Reserve at this site is expected to have a significant adverse impact on existing users. The extension area will likely have some impact on the Danish seine fishery, so Network 2 does not include it in B2, however Network 1 does incorporate the extension within the proposed Type 2 MPA at C1 – Waitaki offshore.

The foraging range of kororā (little penguins) indicates that the area around the Waitaki River mouth is an important habitat, as the foraging behaviour of the penguins is an indicator for habitat and biodiversity in general. This proposal includes some of the habitats that are used by kororā (little penguins).

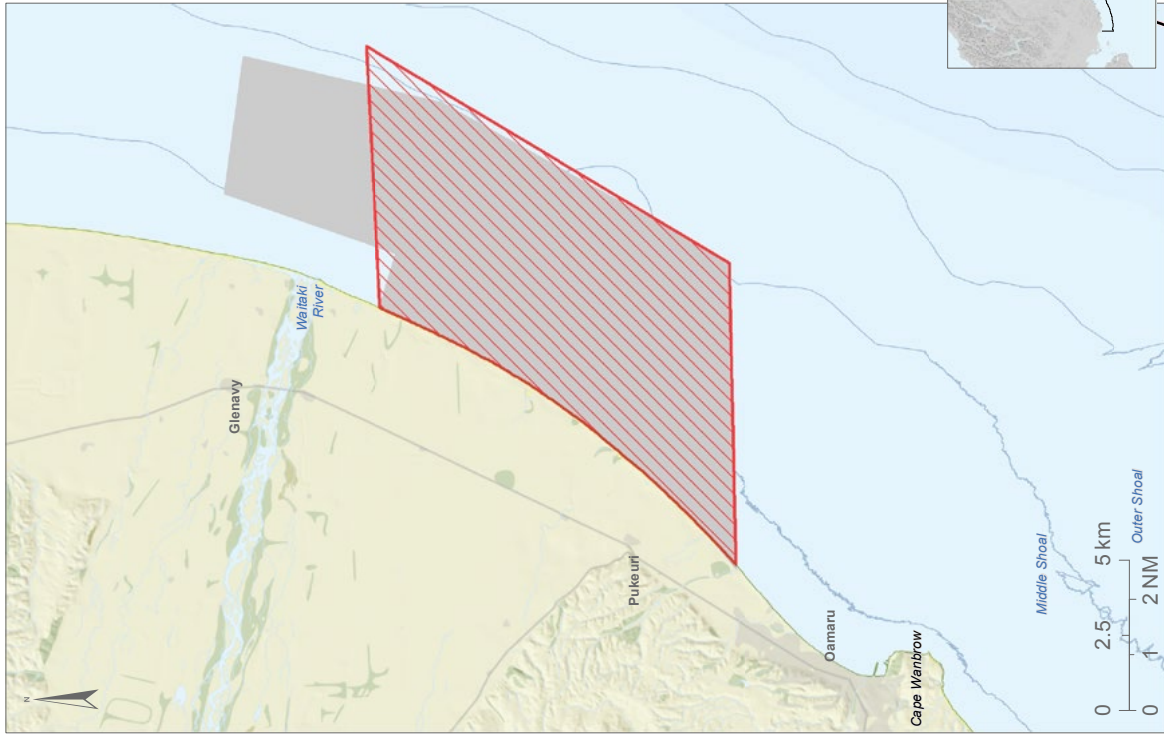
The proposed Marine Reserve at Site B along with the Type 2 MPA at Site C1 – Waitaki Offshore provide protection for pahu (Hector's dolphins) and the area that supports the highest measured foraging density for kororā (little penguins).¹²⁹ It also includes a large area

¹²⁹ A map of the penguin foraging range in the Forum region can be viewed at <http://seasket.ch/2wbl5J0hF2> or in the following thesis: Agnew, P. 2015: Demographic parameters, foraging and responses to environmental variation of kororā (little penguins) (*Eudyptula minor*). Unpublished PhD thesis, University of Otago, Dunedin.

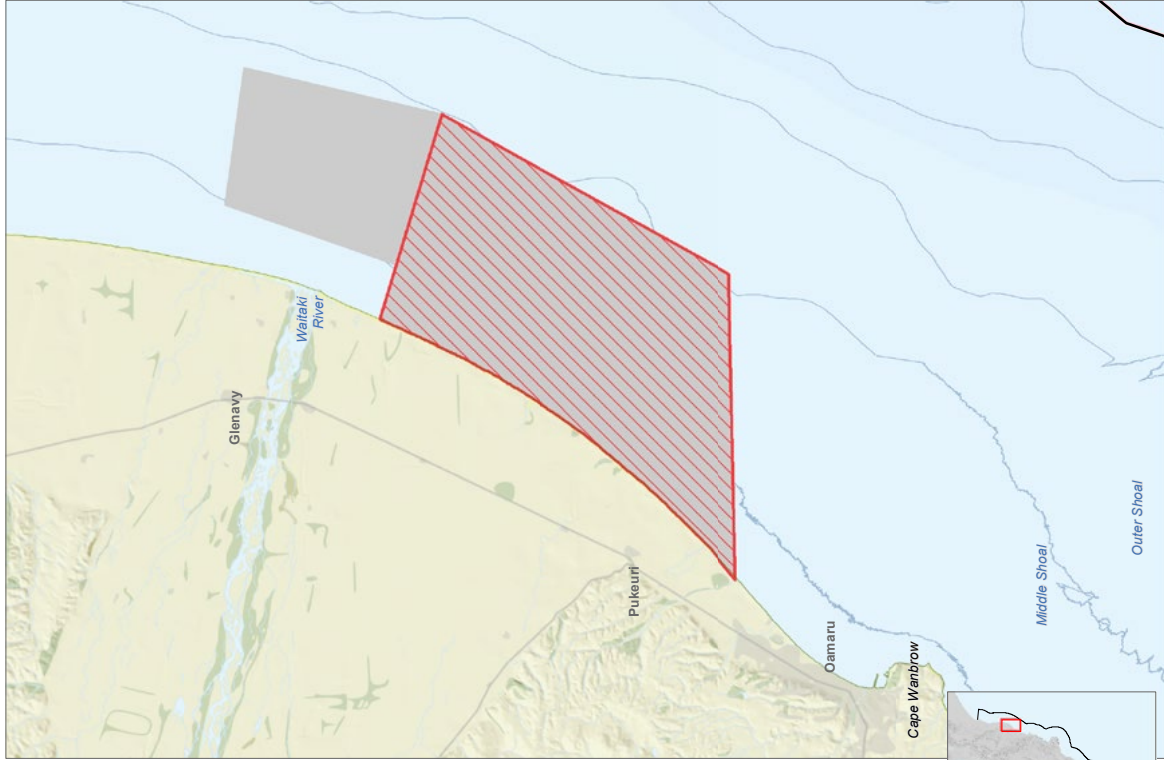
Figure 2-24:
Site B - Waitaki coastal
overview map

Two variations of this site are shown: *Network 1, Site B1;* and *Network 2, Site B2.*

Network 1, Site B1



Network 2, Site B2



Management areas

-  Marine Reserve
-  Type 2 MPA
-  Consultation area
-  Forum region

of nutrient-rich, northern-flowing water from the Waitaki River. The Marine Reserve would protect important habitat for these species, reduce the potential for incidental fisheries captures and help maintain the rich diversity of large animals that utilise the area. The majority of this site is already subject to a 4 NM offshore closed area for set netting, a 3 NM closed area for Danish seining and a 1 NM closed area for trawling with a headline height greater than 1 m.

Both Sites B1 and B2 provide a link in the network of MPAs along the Forum region’s coastline, as well as replication of some habitat types that are present in the Type 2 MPA at Sites A1 and A2 – Tuhawaiki.

What submitters said

Overall, the majority of submitters supported Site B as outlined in the Consultation Document.

All of the science submitters supported this site as detailed in the Consultation Document (67 supported; 11 supported with changes) and most (65) also supported an extension (1 requested no extension), with 27 requesting an extension to the 12 NM limit to the territorial sea.

The majority of commercial submitters supported Site B without the extension and maintained that it should have Marine Reserve status. These contributors believed that any extension north or seaward would impact on existing users for trawling and set netting since they have already been pushed 4 NM offshore for set netting and have restrictions on the bottom trawl headline height within this area.

Submitters in support of this site highlighted its importance for foraging habitats for pahu (Hector’s dolphins) and penguins, as well as the unique gravel habitat and rhodolith beds it contains. Many of the submitters also supported the extension proposed in the Consultation Document to protect a wider area of dolphin and penguin foraging areas, and the marine processes associated with the Waitaki River mouth. Most of those who supported this site without the extension did so because there would be less impact on fishing.

Many submitters proposed extending the area out to 12 NM.

The few opposing submitters did not consider that protection was needed as they wished to continue fishing, or considered that the weather and tides already protect the area and that the greatest threat is silt and water pollution.

Since the exact boundary of Site B1 was not included in the Consultation Document, no indications of support for, or opposition to, the amended boundary are available.

Table 2-13 shows the positions of pro forma and individual submitters in relation to Site B as consulted on.

Table 2-13: Summary of submissions for Site B

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1961	0	1
Individual	293	27	56
Total	2254	27	57

2.4.3.3 ANALYSIS OF SITE B1 & B2

Table 2-14: Site B1 and B2 analysis – Meeting the Policy requirements

	Site B1 Waitaki Coastal – Network 1	Site B2 Waitaki Coastal – Network 2
Description	The proposed Marine Reserve extends south of the Waitaki River mouth for 14.8 km (8 NM) and offshore 8 km (4.3 NM), encompassing 101.3 km ² . It accounts for 1.1% of the total area of the Forum region and 1.9% of the coastline.	The proposed Marine Reserve extends south of the river mouth 14.8 km (8 NM) and offshore 8 km (4.3 NM), encompassing 88.4 km ² . It accounts for 1.0% of the total area of the Forum region and 1.9% of the coastline.
Relationship to Consultation Document	The boundary differs from the option consulted on as its north-east corner is further north. However, the remaining boundary is unchanged. It includes part of an extension that was consulted on and two additional smaller areas to provide a simple boundary for the whole site. The total additional size is smaller than the main area and extension that were consulted on.	This option has the same boundaries that were consulted on. The majority of submitters agreed with the current size and extent of this area.
Recommended management tool(s) ¹³⁰ / protection standard	<ul style="list-style-type: none"> • Marine Reserve 	<ul style="list-style-type: none"> • Marine Reserve • It is recommend that under the Resource Management Act 1991¹³¹ the health of the Marine Reserve be maintained through optimal water quality outflow from the Waitaki River.
Representative (sufficient extent and quality to meet the protection standard) ¹³²	<p>Network 1 proponents consider that Site B1 includes three habitat types that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Gravel Beach: 13.2% of this habitat type within the region. Representative of this habitat type and the only proposal that includes this habitat in a Marine Reserve. • Moderate Shallow Gravel: 9.6% of this habitat type within the region. Representative of this habitat type. • Moderate Shallow Mud: 10.4% of this habitat type within the region. This area likely represents the inshore biodiversity of this broad-scale habitat relatively well, but is unlikely to represent the biodiversity associated with the offshore components (20–30 m depth). 	<p>Network 2 proponents consider that Site B2 includes three habitat types that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Gravel Beach: 13.2% of this habitat type within the region. Representative of this habitat type and the only proposal that includes this habitat in a Marine Reserve. • Moderate Shallow Gravel: 8.2% of this habitat type within the region. Representative of this habitat type. • Moderate Shallow Mud: 10.2% of this habitat type within the region. This area likely represents the inshore biodiversity of this broad-scale habitat relatively well, but is unlikely to represent the biodiversity associated with the offshore components (20–30 m depth).

¹³⁰ For further details on existing management tools in the Forum region, see Section 2.3.

¹³¹ See Section 4.1 Land-Based Impacts on the Coastal Environment.

¹³² See Appendix A1.1 for complete habitat data.

	Site B1 Waitaki Coastal – Network 1	Site B2 Waitaki Coastal – Network 2
Kāi Tahu cultural assessment ¹³³	<p>The Waitaki River is a singularly important tribal taonga and an essential element of Kāi Tahu tribal identity, commencing from its headwaters at Aoraki and descending to the sea. The historic settlement Korotuaheka and associated burial ground are located on the south side of the Waitaki River mouth, an area that is noted for its archaeological values. Historically, the river provided, and continues to provide, many forms of mahika kai, including migrating tuna (eel), and yellow-eyed mullet and black flounder at its mouth. The exclusion of the river mouth and its immediate area extending 2 km south of the mouth from Sites B1 and B2 is to recognise and provide for customary fisheries interests. These interests include Te Awakokomuka (fishing easement) and the area around the traditional settlement of Korotuaheka.</p> <p>Three rūnaka share mana-moana / manawhenua for Sites B1 and B2 – Moeraki, Arowhenua and Waihao. However, Arowhenua and Waihao interests south of the Waitaki River mouth are centred around the historic Korotuaheka pā site. The area south of the Waitaki River mouth is otherwise the takiwā of Te Rūnanga o Moeraki, while the area north of the Waitaki River mouth is the takiwā of Te Rūnanga o Arowhenua and Te Rūnanga o Waihao.</p> <p>The marine area within the proposed sites is fished by Kāi Tahu commercial fishers, some of whom submitted and were supportive of Sites B1 and B2 (but opposed to Site C1).</p> <p>The site excludes the Waitaki River mouth (including points immediately north and south of the mouth) to recognise and provide for customary fisheries activity interests.</p>	
Adverse impacts on existing users	<p>Commercial fishing¹³⁴</p> <p>Danish seining is already prohibited out to 3 NM throughout the South Island coastal area¹³⁵ and no commercial dredging, potting or pāua diving is thought to occur in the area. The outer edge of the site would have minor impacts on set netting, dredging and longlining, but the site generally avoids important trawling and longlining areas for commercial quota species.</p> <p>The economic impact of the proposed Marine Reserve is not expected to be high, but it will still have some effect on existing users. All catches are in relatively low amounts (650 kg or less for each stock) in the proposed Marine Reserve.</p> <p>The proposed Marine Reserve would protect juvenile fish habitat.</p> <p>Based on SeaSketch reporting, the top three fisheries that will be displaced by Site B1 are:</p> <ul style="list-style-type: none"> • Danish seine: 2.4% • Line¹³⁶: 0.5% • Trawl – tarakihi: 0.3%. 	<p>Commercial fishing</p> <p>Danish seining is already prohibited out to 3 NM throughout the South Island coastal area and no commercial dredging, potting or pāua diving is thought to occur in the area. The outer edge of the site would have minor impacts on set netting, dredging and longlining, but the site generally avoids important trawling and longlining areas for commercial quota species.</p> <p>The economic impact of the proposed Marine Reserve is not expected to be high, but it will still have some effect on existing users. All catches are in relatively low amounts (500 kg or less for each stock) in the proposed Marine Reserve.</p> <p>The proposed Marine Reserve would protect juvenile fish habitat.</p> <p>Based on SeaSketch reporting, the top three fisheries that will be displaced by Site B2 are:</p> <ul style="list-style-type: none"> • Danish seine: 1.8% • Line: 0.5% • Trawl – Tarakihi: 0.3%.

¹³³ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

¹³⁴ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹³⁵ Danish seining is prohibited within 3 NM of the coast under reg 70 of the Fisheries (Commercial Fishing) Regulations 2001, and set netting is prohibited within 4 NM of the coast under reg 5AAC of the Fisheries (South-East Area Commercial fishing) Regulations 1986.

¹³⁶ Bottom longline and dahn line.

	Site B1 Waitaki Coastal – Network 1	Site B2 Waitaki Coastal – Network 2
<p><i>Adverse impacts on existing users continued</i></p>	<p>Noting the limitations set out in Section 2.4.1.2, MPI estimates:</p> <ul style="list-style-type: none"> • The export value of potentially displaced fisheries at \$21,000, based on a volume of 4,579 kg of fish. • Of this, the main displacement would occur in the Danish seine and trawl fisheries for: <ul style="list-style-type: none"> ◦ Kumukumu (red gurnard) – 570 kg, with an export value of \$4,000 ◦ Mako repe (elephant fish) – 580 kg, with an export value of \$3,000 ◦ Tarakihi – 475 kg, with an export value of \$2,500 ◦ Mako (rig) – 405 kg, with an export value of \$2,500 ◦ Hoka (red cod) – 645 kg, with an export value of \$1,000. • Less than three fishers Danish seine in this area, with an average total of 117 Danish seine events that include Site B1 per year. • Fifteen fishers trawl in this area, with an average total of ten trawl events in Site B1 per year. • A total of 31 commercial fishers are thought to fish in this area or in the wider statistical area within which Site B1 is located, among whom: <ul style="list-style-type: none"> ◦ Four fishers have catches of 300 kg or more which could be displaced, affecting between <0.1% and 0.4% of the individual fishers' catch within the relevant quota management areas ◦ The individual fishers with the top three maximum displacements of catch by volume could be: <ul style="list-style-type: none"> - 2,499 kg (0.1% of the fisher's catch) - 459 kg (0.3% of the fisher's catch) - 359 kg (0.4% of the fisher's catch). • Twenty-nine fishers would have 1% or less of their catch within the relevant quota management areas displaced. 	<p>Noting the limitations set out in Section 2.4.1.2, MPI estimates:</p> <ul style="list-style-type: none"> • The export value of potentially displaced fisheries at \$17,000, based on a volume of 3,600 kg of fish. • Of this, the main displacement would occur in the Danish seine and trawl fisheries for: <ul style="list-style-type: none"> ◦ Kumukumu (red gurnard) – 410 kg, with an export value of \$2,800 ◦ Mako repe (elephant fish) – 470 kg, with an export value of \$2,500 ◦ Mako (rig) – 340 kg, with an export value of \$2,000 ◦ Tarakihi – 370 kg, with an export value of \$2,000. • Less than three fishers Danish seine in this area, with an average total of 117 Danish seine events that include Site B2 per year. • Fifteen fishers trawl in this area, with an average total of ten trawl events in Site B2 per year. • A total of 31 commercial fishers are thought to fish in this area or in the wider statistical area within which Site B2 is located, among whom: <ul style="list-style-type: none"> ◦ Three fishers have catches of 300 kg or more which could be displaced, affecting between <0.1% and 0.4% of the individual fishers' catch within the relevant quota management areas ◦ These three fishers could experience displacements by volume of catch of: <ul style="list-style-type: none"> - 1,736 kg (<0.1% of the fisher's catch) - 379 kg (0.2% of the fisher's catch) - 368 kg (0.4% of the fisher's catch). ◦ Twenty-nine fishers would have 1% or less of their catch within the relevant quota management areas displaced.

	Site B1 Waitaki Coastal – Network 1	Site B2 Waitaki Coastal – Network 2
Adverse impacts on existing users continued	<p>Recreational fishing</p> <p>The majority of recreational fishing within this site (particularly for salmon, inaka (whitebait) and kahawai) occurs directly around the mouth of the Waitaki River, which is excluded from the Marine Reserve proposal. This proposed Marine Reserve is not known to be a high-value recreational fishing area.</p> <p>Salmon fishing could benefit from the restriction of trawling nearby, as part of this MPA and the associated Type 2 MPA at Site C1 – Waitaki Offshore.</p> <p>It is expected that there will be no impact on recreational salmon fishing and kohikohi inaka (whitebaiting) at the river mouth, and minimal overall impact across the site as little recreational fishing takes place here. Furthermore, the Marine Reserve should enhance recreational mako repe (elephant fish) and mako (rig) fishing by protecting the nursery grounds of these species.</p>	<p>Recreational fishing</p> <p>The majority of recreational fishing within this site (particularly for salmon, inaka (whitebait) and kahawai) occurs directly around the mouth of the Waitaki river, which is excluded from the Marine Reserve proposal. This proposed Marine Reserve is not known to be a high-value recreational fishing area.</p> <p>It is expected that there will be no impact on recreational salmon fishing and kohikohi inaka (whitebaiting) at the river mouth, and minimal overall impact across the site as little recreational fishing takes place here. Furthermore, the Marine Reserve should enhance recreational mako repe (elephant fish) and mako (rig) fishing by protecting the nursery grounds of these species.</p>
	<p>Resource consents</p> <ul style="list-style-type: none"> • Oamaru town contaminants such as stormwater. • Alliance Pukeuri freezing works discharge treated effluent and storm water into an irrigation race, flows from which go to a 225-ha disposal field. Consents for direct discharge into the ocean at high tide – Otago Regional Council consent number 98521.V1 (2000-2034). 	
Other impacts	<p>Accessibility</p> <ul style="list-style-type: none"> • Clay cliffs characterise much of the coastline and a gravel beach extends the entire length of the site. • The proximity of Sites B1 and B2 to Oamaru is noted (less than 4 NM and within half an hour’s drive to the coastline). • The closest approach by land is via the end of McEneaney Road at a site known locally as Craig’s Beach. • Road access is limited. • Boats under 15 m with a draft of less than approximately 1.7 m can launch from a ramp at Oamaru Harbour or from a wharf or mooring. • For air surveillance, Oamaru Airport at Hildethorpe, off State Highway 1 (SH1), is about a 15 minute drive from the centre of Oamaru. • Public access to the shoreline boundary is limited. Visitors would need to walk from the end of Kaik Road south of the Waitaki River mouth along the gravel beach to reach the boundary. • Fisheries Road on the north bank via Glenavy is commonly used by recreational fishers. • Both Sites B1 and B2 exclude the Te Awakokomuka fishing easement. • The river mouth moves north or south by up to 1 km approximately every 15 years through natural processes. The coast boundary of this site takes such movement into account. • There is limited access on foot to the landward boundary. <p>Benefits</p> <ul style="list-style-type: none"> • Kelp is an important habitat and could provide future scientific interest. There has been little scientific study of the area to date but observations of juvenile fish and undescribed kelp habitats would provide obvious opportunities for research. • Adds to Oamaru’s marine natural and recreational assets. • Indirect economic benefits through enhancing protection for Oamaru’s kororā (little penguins) and its associated tourism operation. 	

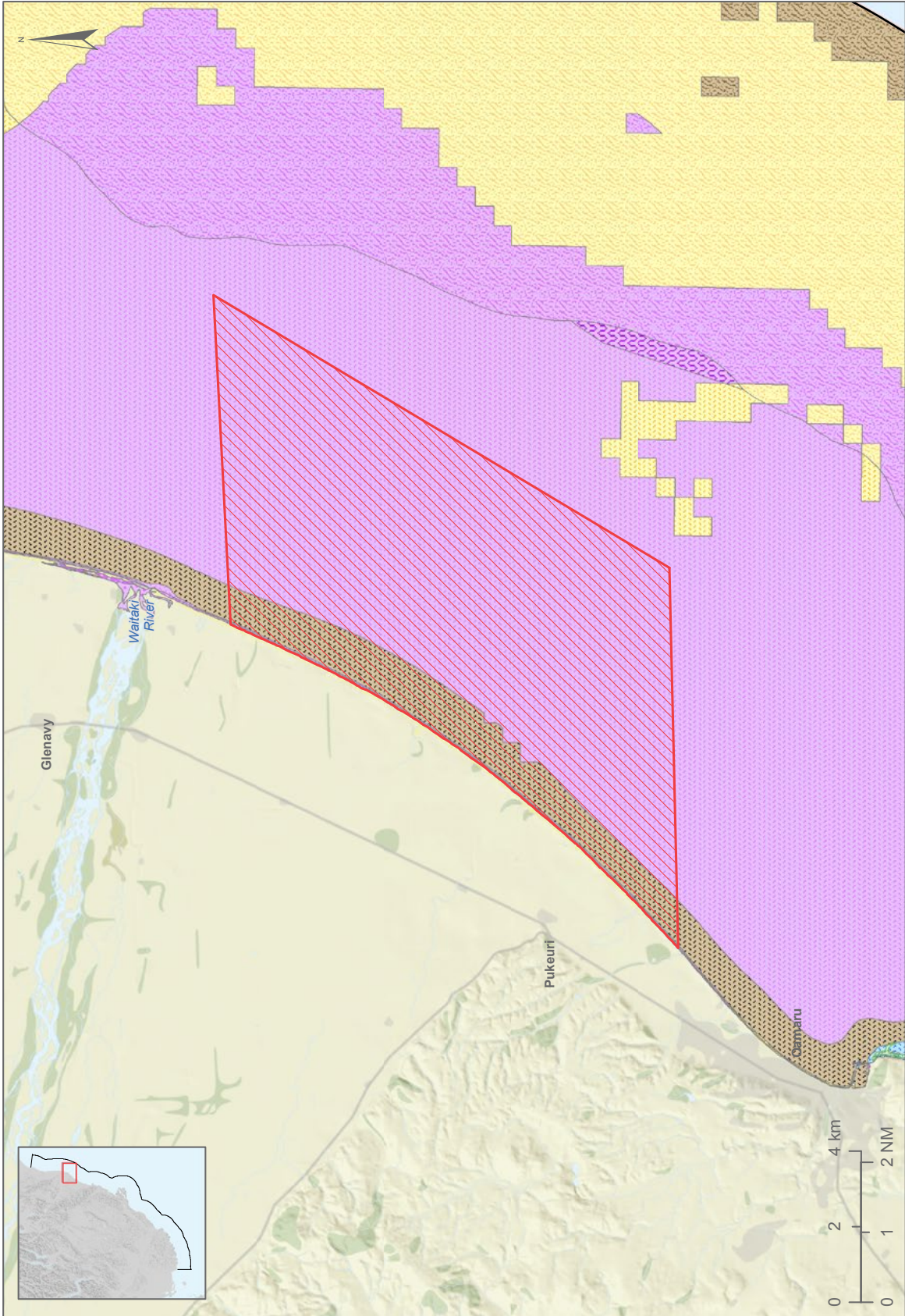


Figure 2-25: Broad-scale habitat map for Site B1 - Waitaki coastal

** For legend, see inside back cover.*

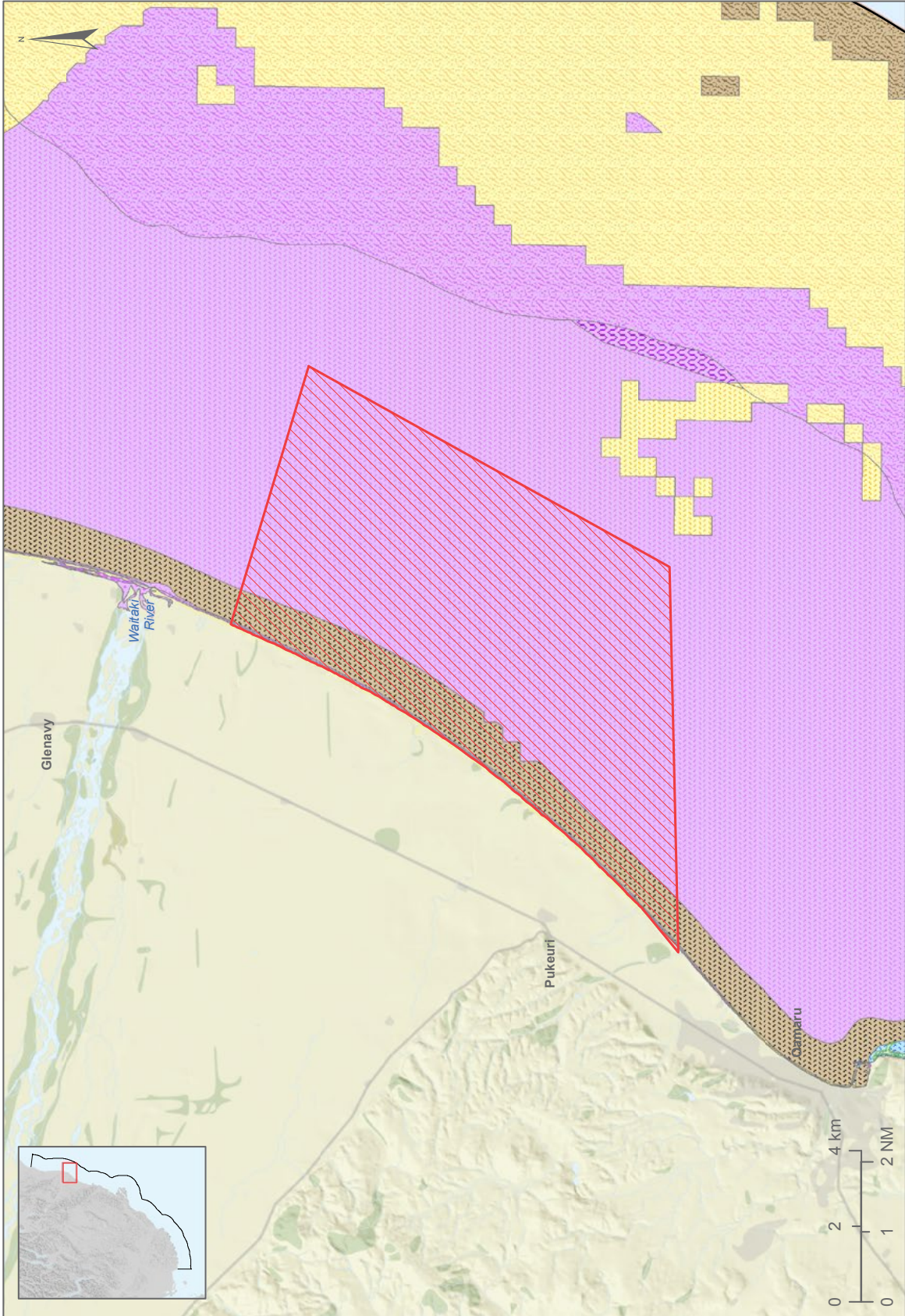
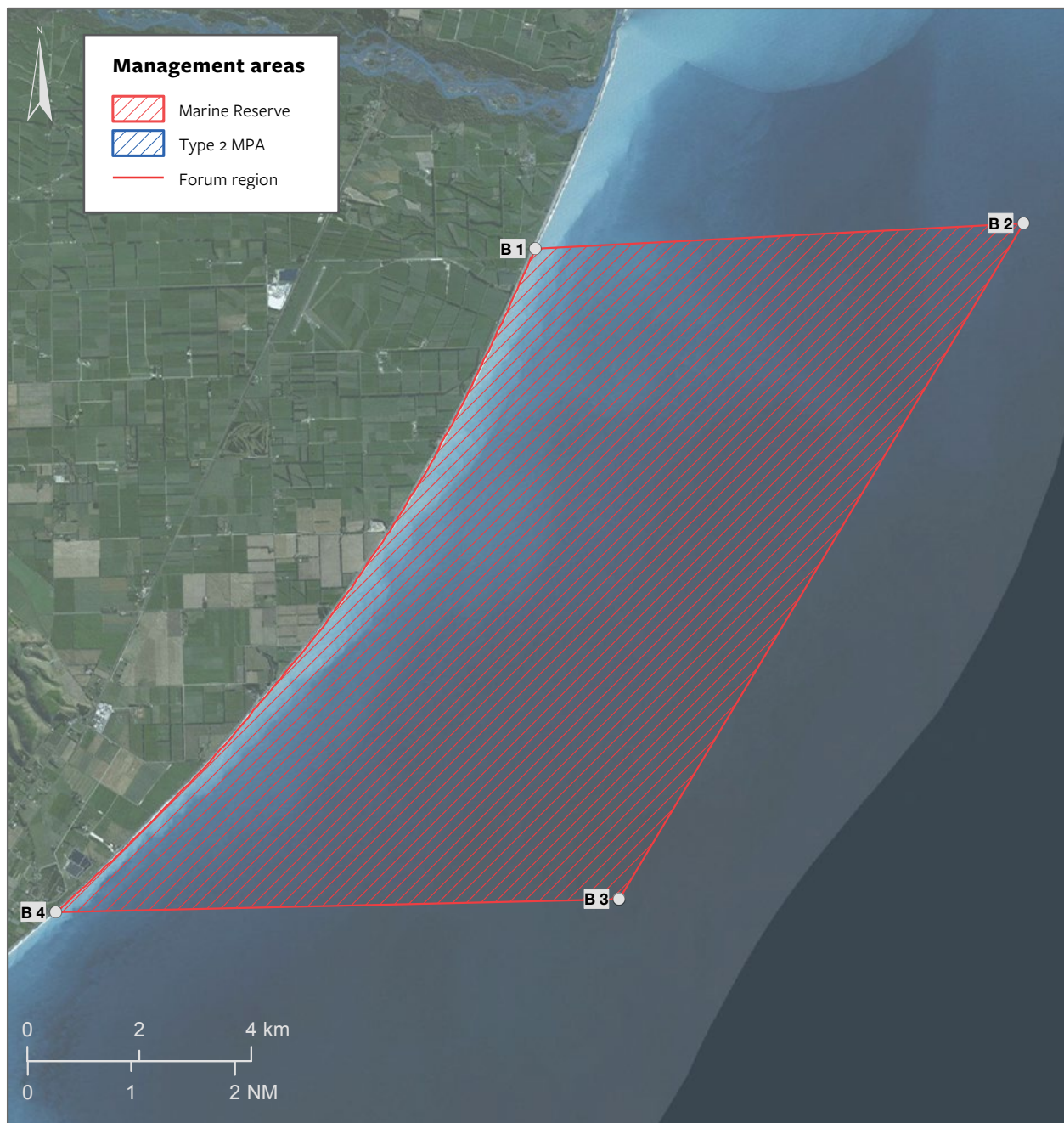


Figure 2-26: Broad-scale habitat map for Site B2 - Waitaki coastal

** For legend, see inside back cover.*

Figure 2-27: Location map for Site B1 – Waitaki coastal



Index to Boundary Points		
Vertices	Latitude	Longitude
B 1	44° 57.579' S	171° 07.983' E
B 2	44° 57.438' S	171° 14.623' E
B 3	45° 03.871' S	171° 08.921' E
B 4	45° 03.865' S	171° 01.251' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
B1-B2	8734	4.716
B2-B3	14072	7.598
B3-B4	10067	5.436

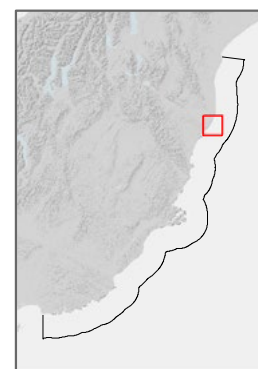
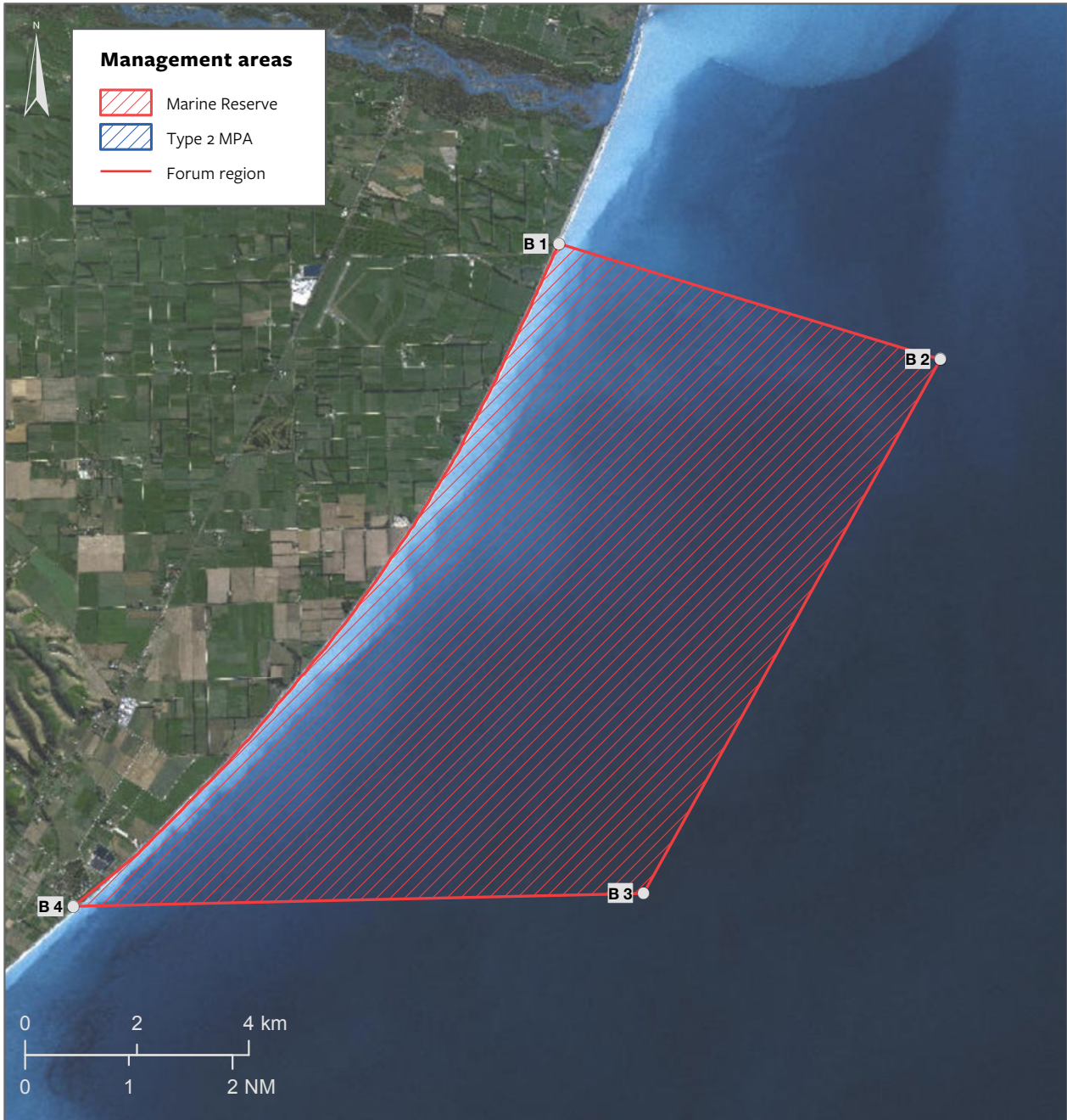
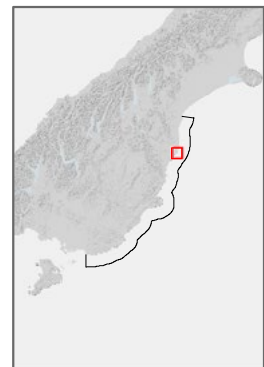


Figure 2-28: Location map for Site B2 – Waitaki coastal



Index to Boundary Points		
Vertices	Latitude	Longitude
B1	171° 7.980' E	44° 57.580' S
B2	171° 13.137' E	44° 58.777' S
B3	171° 8.928' E	45° 3.871' S
B4	171° 1.156' E	45° 3.866' S

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
B1 - B2	7134	3.852
B2 - B3	10934	5.904
B3 - B4	10201	5.508
B4 - B1	14873	8.031



2.4.4 Waitaki Offshore Site – C1 (Type 2)

2.4.4.1 OVERVIEW

Site C is only included in Network 1.

The proposed Site C1 includes minor boundary changes from what was consulted on (see Figure 2-21). Site C1 adjoins Site B1 as shown in Figure 2-29 and Figure 2-24.

Network 1 proponents contend that Site C1 contributes significantly to the network representation for three habitat types.

2.4.4.2 WHY THIS SITE IS RECOMMENDED

The Waitaki River has a strong influence on the North Otago and South Canterbury coasts, both in terms of freshwater inputs to the marine environment and the transportation of sediment from the land to the sea.

This site complements the protection afforded by Site B1 without requiring a full no-take Marine Reserve. The proposed restrictions for Site C1 would allow for the protection of physical features and ecological systems in a way that is consistent with the MPA Policy protection standard.

The use of the area by seabirds and mammals is an indicator of its high biodiversity values and associated habitats. The proposed MPA would assist in the maintenance and recovery of biodiversity values by prohibiting impacts on the seafloor, reducing fishing pressure, and decreasing risks to seabirds and mammals.

The site covers an area that is known to be important for kororā (little penguins) and pahu (Hector's dolphins). The known foraging range of kororā (little penguins) from the Oamaru colony includes the area around and to the north of the Waitaki River mouth. The presence of pahu (Hector's dolphins), penguins and other seabirds suggests that prey species and important habitats occur in the area. This site also includes a large area of nutrient-rich northern-flowing water from the Waitaki River.¹³⁷ The proposed restrictions would protect important habitat for these species, reduce the potential for incidental fisheries captures and help maintain the rich diversity of large animals that utilise the area.

It should be noted that there are currently mitigation measures on commercial vessels, which are reducing the negative impacts on seabirds and dolphins. The proposed MPA will further reduce bycatch of seabirds in the vicinity, which are still being recorded. The seaward boundary of the site was drawn at 10 km (5.4 NM) to avoid displacing trawl fishery effort. However, this decision is likely to reduce the site's effectiveness in protecting the habitat of seabirds and dolphins. The site establishes a link in the MPA network along the Forum region's coastline and provides replication of some habitat types that are present at Site A1.

The proposal of a Type 2 MPA (rather than a Marine Reserve) for the Waitaki River mouth is to ensure that there is no impact on the customary and recreational fishing associated with the river mouth. In particular, salmon fishing and kohikohi inaka (whitebaiting) around the Waitaki River mouth will remain unaffected by the proposed restrictions for this site.

¹³⁷ A map of the penguin foraging range in the Forum region can be viewed at <http://seasket.ch/2wbL5J0hF2> or in the following thesis: Agnew, P. 2015: Demographic parameters, foraging and responses to environmental variation of kororā (little penguins) *Eudyptula minor*. Unpublished PhD thesis, University of Otago, Dunedin.

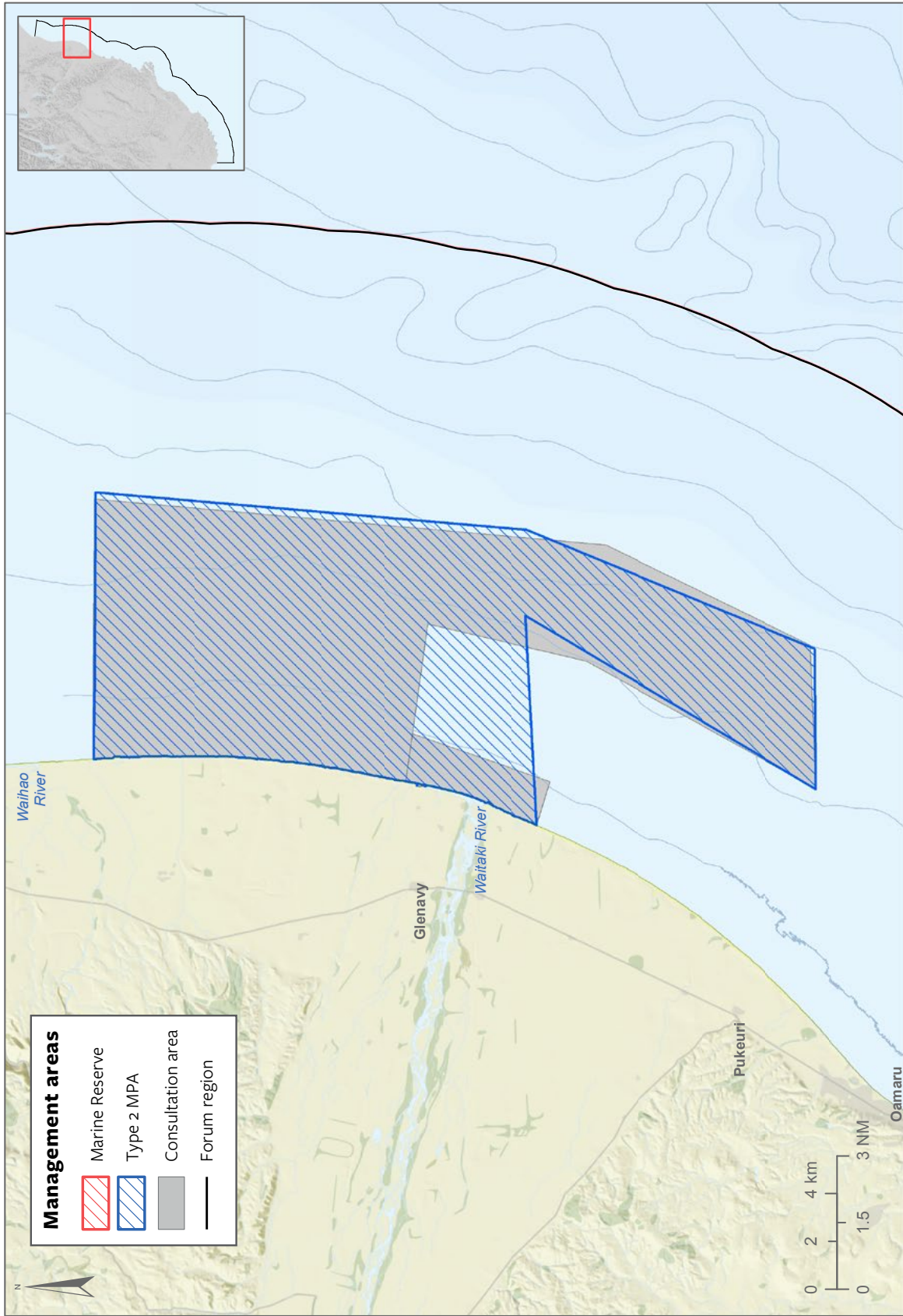


Figure 2-29: Site C1 – Waitaki Type 2 MPA overview map

The public may access this area at the Waitaki River mouth. The natural value of the area around the river mouth and 3 km north is highlighted by the fact Environment Canterbury has designated it an area of significant natural value.

2.4.4.3 WHAT SUBMITTERS SAID

The majority of submitters supported the site as included in the Consultation Document.

Science submitters requested consideration of an MPA with simplified alongshore boundaries that include the Waitaki River mouth and extend to the 12 NM limit, with the outer portion restricting commercial take, particularly using ground-impacting methods and set nets, and bounding a larger core no-take area (Site B1).

Commercial submitters opposed this site and suggested that the existing set net closure to 4 NM should be considered sufficient protection (highlighting the impacts of this proposed MPA on commercial fishing, particularly when sites B1 and C1 are combined).

Submitters supporting this site noted the importance of the location for pahu (Hector’s dolphins), penguins, seabirds, kelp forest, gravel bed habitat and rhodolith beds, and highlighted the influence of productivity associated with the Waitaki River. Many supporters also recommended extending the area out to 12 NM to better protect foraging habitats, and to include more deep gravels and deep mud habitats, which are poorly represented. Some submitters also supported banning set nets.

Submitters who opposed this site contended that it disadvantaged recreational fishers, and that the weather and tides already protect the area.

Table 2-15 shows the positions of pro forma and individual submitters in relation to Site C.

Table 2-15: Summary of submissions for Site C

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1083	737	140
Individual	144	96	43
Total	1227	833	183

2.4.4.4 ANALYSIS OF SITE C1

Table 2–16: Site C1 analysis – Meeting the Policy requirements

Site C1 Waitaki Offshore – Network 1	
Description	This site is contiguous with Site B1 – Waitaki Coastal, wrapping around to the north to reach the shoreline. It spans approximately 19 km of coastline and encompasses 254 km ² .
Relationship to Consultation Document	Site C1 has been modified to a minor extent compared with the site that was consulted on. The main change is that some of the area that had been considered as an extension to the proposed Site B Marine Reserve as consulted on has instead been incorporated into Site C1 as a Type 2 MPA.
Recommended management tool(s) / protection standard	<p>A Type 2 MPA that includes the following prohibitions:</p> <ul style="list-style-type: none"> • Trawling • Dredging • Danish seining • Set netting • Bottom disturbance and seismic testing associated with any activity. <p>This site complements the protection afforded by Site B1 without requiring a full no-take Marine Reserve. The proposed restrictions would allow for protection of the physical features and ecological systems in a way that is consistent with the MPA Policy protection standard.</p> <p>See Appendix A2.2 for further details on the recommended protection tools.</p>
Representative (sufficient extent and quality to meet the protection standard) ¹³⁸	<p>Network 1 proponents consider that Site C1 includes three habitats that likely contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Gravel Beach: 20.4% of this habitat type within the region. Represents this habitat type well. • Moderate Shallow Gravel: 16.9% of this habitat type within the region. Represents this habitat type well. • Moderate Shallow Mud: 14.8% of this habitat type within the region. This area represents the biodiversity of this broad-scale habitat type well in the shallow nearshore, but does not adequately represent the offshore components of the habitat (20–30 m depth). <p>A further two habitat types are thought to occur at this site but are considered unlikely to significantly contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Shallow Sand: 2.7% of this habitat type within the region. Poorly represents this widespread, broad-scale habitat type. • Deep Gravel: 1.5% of this habitat type within the region. Poorly represents this widespread, broad-scale habitat type. <p>One additional habitat type in the classification appears to occur at this site but is considered an artefact of the classification and unlikely to be a distinct habitat:</p> <ul style="list-style-type: none"> • Exposed Shallow Gravel: A very small amount of this habitat type exists in the region and this is most likely an artefact of the classification process.

¹³⁸ See Appendix A1.1 for complete habitat data.

Site C1 Waitaki Offshore – Network 1

Kāi Tahu cultural assessment¹³⁹

There are high customary fisheries interests immediately in and around the Waitaki River mouth (outside the Site C1 proposal). The Waihao marae and Māori Reserve lands are located just to the north of Site C1, and the site also includes an old settlement, burial ground and wāhi taōka (treasured place). Access to the marae and Māori land (Fenton Reserves) is via Māori Road. This area and the waterways, including the lower Waihao River and Wainono Lagoon, are of high cultural importance to Kāi Tahu hapū associated with this area (represented by traditional settlements and rich mahika kai resources).

There is a freshwater mātaimai reserve over waterways associated with the Waihao River, Wainono Lagoon and their tributaries located to the east of SH1, gazetted 13 September 2012.

The kaitiaki of the customary rights located in the coastal area covered by Site C1 is undertaken by the whānau and hapū of the Te Rūnaka o Waihao (to the north of the Waitaki River mouth) and Te Rūnaka o Moeraki (to the south of the Waitaki River mouth), while Te Rūnaka o Arowhenua shares an interest.

The area is fished by Kāi Tahu commercial fishers, some of whom were opposed to Site C1.

¹³⁹ Refer to Section 2.4.1 – Cultural Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

Site C1 Waitaki Offshore – Network 1

Adverse impacts on existing users

Commercial fishing¹⁴⁰

Existing prohibitions on Danish seining and set netting apply to some of the proposed MPA.¹⁴¹ Based on SeaSketch reporting, the top three fisheries that will be displaced by Site C1 are:

- Danish seine: 12.3%
- Net – mako (school shark): 5%
- Net – mako (rig): 2.6%.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$145,000, based on a volume of 32,695 kg of fish.
- Of this, the main impacts could be on the:
 - Kumukumu (red gurnard) Danish seine and trawl fisheries – 3,860 kg, with an export value of \$26,400
 - Mako (school shark) set net fishery – 4,600 kg, with an export value of \$22,300
 - Mako (rig) Danish seine and setnet fisheries – 3,190 kg, with an export value of \$19,200
 - Mako repe (elephant fish) Danish seine, trawl and set net fisheries – 3,640 kg, with an export value of \$19,000
 - Tarakihi Danish seine fishery – 1,925 kg, with an export value of \$9,900.
- Thirty-three fishers trawl within Site C1, with an average total of 23 trawl events at this site per year.
- Twelve fishers set net within Site C1, with an average total of 11 set net events at this site per year.
- Very few fishers Danish seine within Site C1, but there are an average of 117 Danish seine events per year that include this site.
- A total of 45 commercial fishers are thought to fish in this area or in the wider statistical area within which Site C1 is located, including one who dredges and would be affected by the proposed MPA, albeit in only a minor way.

Recreational fishing

The majority of recreational fishing occurs directly around the mouth of the Waitaki River, including salmon fishing and kohikohi inaka (whitebaiting). Under the proposed fishing restrictions, recreational fishing could continue.

Salmon fishing could potentially benefit from the restriction of trawling nearby, as part of this Type 2 MPA and the associated Marine Reserve at Site B1 – Waitaki Coastal. However, trawling is already prohibited within 1 NM of the Waitaki River mouth between 1 January and 30 April, inclusive.¹⁴²

¹⁴⁰ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁴¹ Danish seining is prohibited within 3 NM of the coast under reg 70 of the Fisheries (Commercial Fishing) Regulations 2001, and set netting is prohibited within 4 NM of the coast under reg 5AAC of the Fisheries (South-East Area Commercial fishing) Regulations 1986.

¹⁴² Regulation 5(1)(i) of the Fisheries (South-East Area Commercial Fishing) Regulations 1986

Site C1 Waitaki Offshore – Network 1

Other impacts

Accessibility

- The main land access points are Kaik Road (which is approximately 500 m south of the Waitaki River mouth), Fisheries Road (which reaches the northern lagoons associated with the Waitaki River mouth) and Morven Beach Road (located near the northern boundary of the site).
- There is boat access from Oamaru Harbour.
- Oamaru Airport at Hilderthorpe is a 15-minute drive north of the town centre.
- The Waitaki River mouth is popular with recreational fishers, boaties and beachcombers. There is good road access to both the north and south sides of the mouth.

Benefits

- Indirect benefit for wildlife tourism through better protection of key species (including pahu (Hector's dolphins), penguins and other seabirds for Oamaru and the region).
 - Increases the profile of marine protection in the Waitaki region and the area's commitment to enhancing marine biodiversity.
-

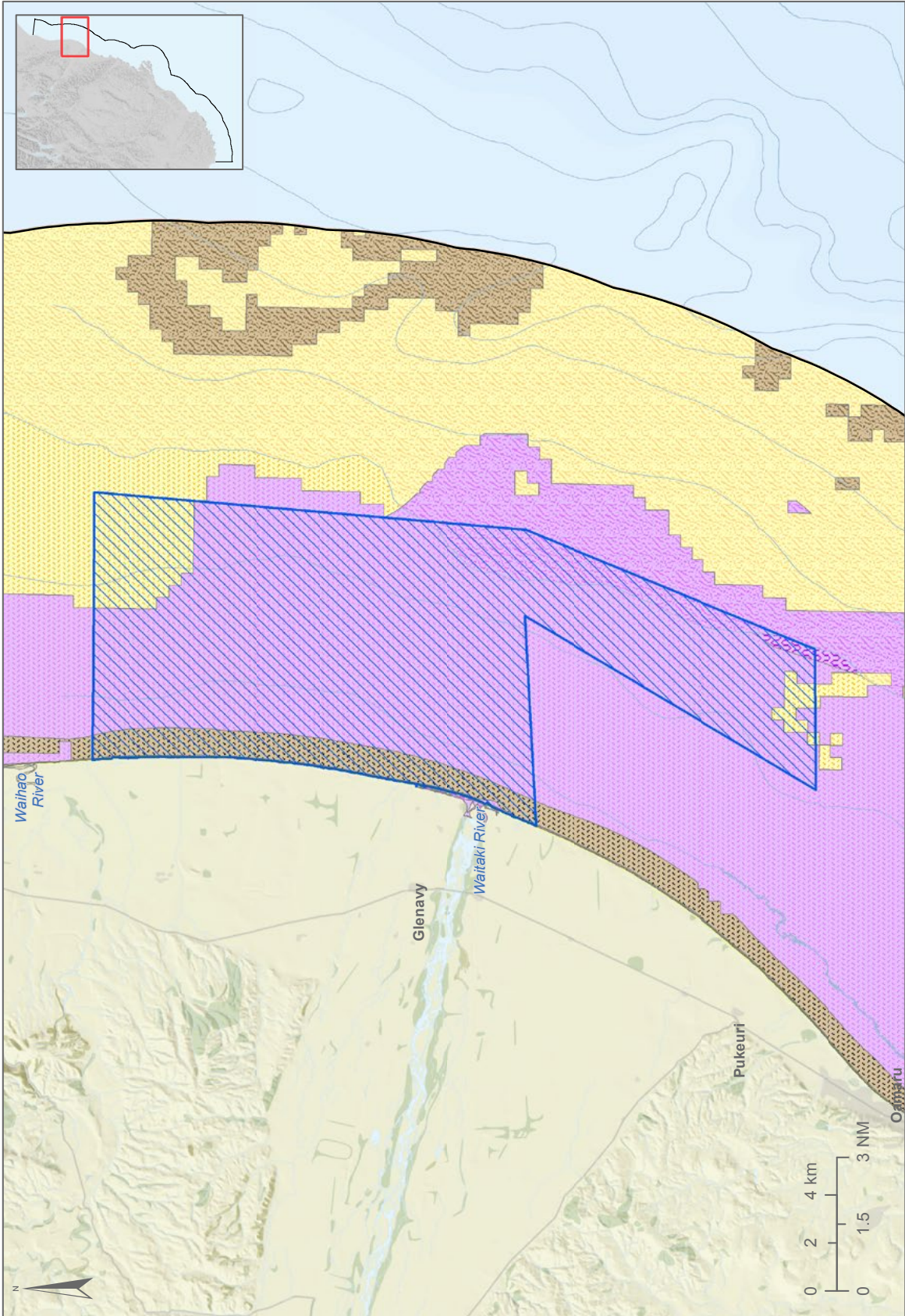
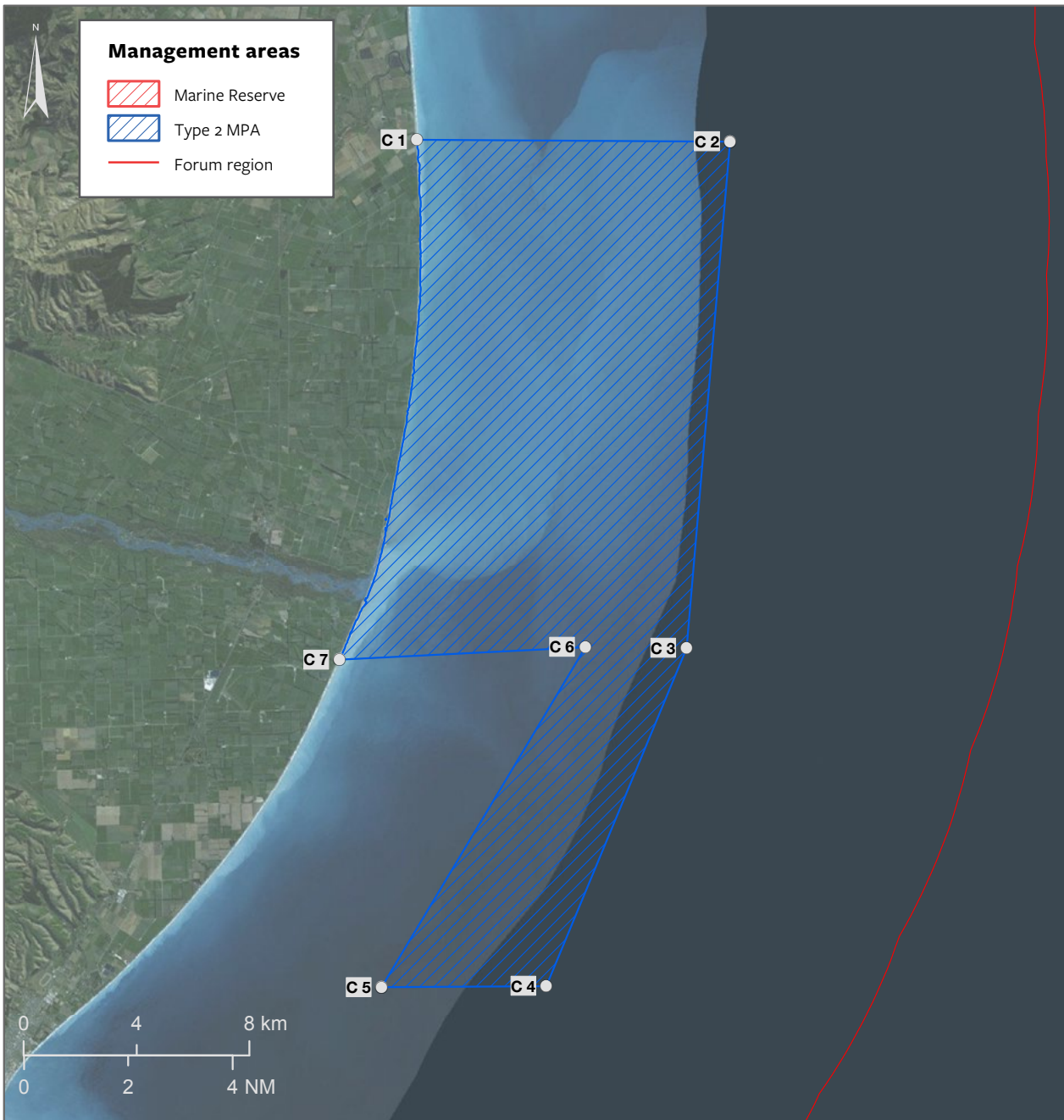


Figure 2-30: Broad-scale habitat map for Site C1 - Waitaki Type 2 MPA

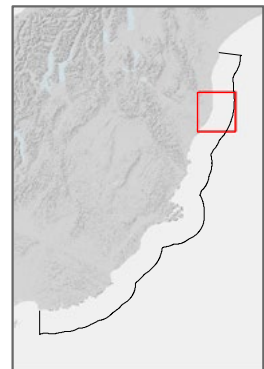
** For legend, see inside back cover.*

Figure 2-31: Location map for Site C1 – Waitaki Type 2 MPA



Index to Boundary Points		
Vertices	Latitude	Longitude
C 1	44° 47.646' S	171° 10.387' E
C 2	44° 47.816' S	171° 18.812' E
C 3	44° 57.502' S	171° 17.349' E
C 4	45° 3.916' S	171° 13.374' E
C 5	45° 3.871' S	171° 8.921' E
C 6	44° 57.438' S	171° 14.623' E
C 7	44° 57.579' S	171° 7.983' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
C1-C2	11113	6.000
C2-C3	18039	9.740
C3-C4	12977	7.007
C4-C5	5845	3.156
C5-C6	14072	7.598
C6-C7	8734	4.716



2.4.5 Pleasant River to Stony Creek – Sites D1 & D2 (Marine Reserve)

2.4.5.1 OVERVIEW

Two options for Site D were included in the Consultation Document, one extending approximately 2 km offshore and another extending approximately 6 km offshore (Figure 2-32).

Network 1 incorporates the second option but extends it further (to approximately 10 km offshore) and also includes a boundary extension to the north (which was not consulted on).

Network 2 incorporates the first option (out to 2 km offshore) but does not include the estuaries.

2.4.5.2 WHY THIS SITE HAS BEEN RECOMMENDED

This area encompasses a large range of habitats in close proximity to each other, providing an opportunity to protect several habitats in one MPA (including rare examples of volcanic rock reefs, estuaries, kelp forests, exposed reef shelves, sea caves and seaweed gardens).

The general area of the site encompasses spectacular inshore habitats and, in particular, a number of kelp forest patch reefs.

The extent to which Sites D1 and D2 incorporate the full range of habitats in the general area described above differs.

The area also has sound potential for tourism development and provides a good opportunity for scientific research.

The proponents of Network 1 recommend that Site D, as consulted on, is extended to represent deep reef habitat, and to ensure connectivity between deep reef and deep sand habitats. Network 1 also protects the estuaries, making it the only site that includes estuaries in a Marine Reserve.

The commercial representatives on the Forum were of the opinion that the inshore area could be protected as a Marine Reserve to preserve the kelp forests that support juvenile kōura papatea (rock lobster) settlement.

2.4.5.3 WHAT SUBMITTERS SAID

The majority of submitters supported Site D in some form, as included in the Consultation Document. However, submitters in support of this site were not clear in many instances about whether they were in favour of the proposed site area extending to 2 km or 6 km offshore.

Since the extension to Site D1 as proposed in Network 1 was not included in the Consultation Document, indications of support for or opposition to the extension are limited to generalisations about the size of the Marine Reserve proposal.

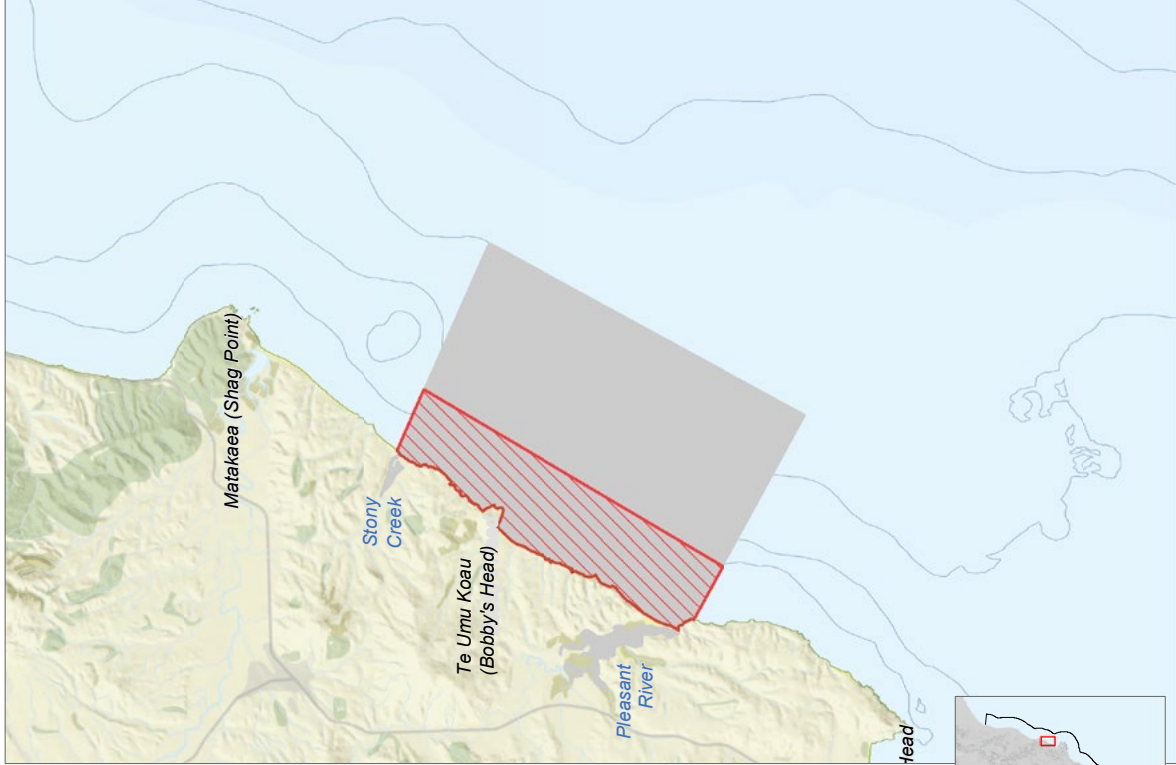
The Science Submissions generally supported the extended option or recommended changes to extend the boundaries even further. The Summary of Science Submissions stated:

Thirty-six explicitly requested extension, 0 requested no extension, and the remaining 46 offered no specific statement about the proposed extension, but may have considered it implicit in

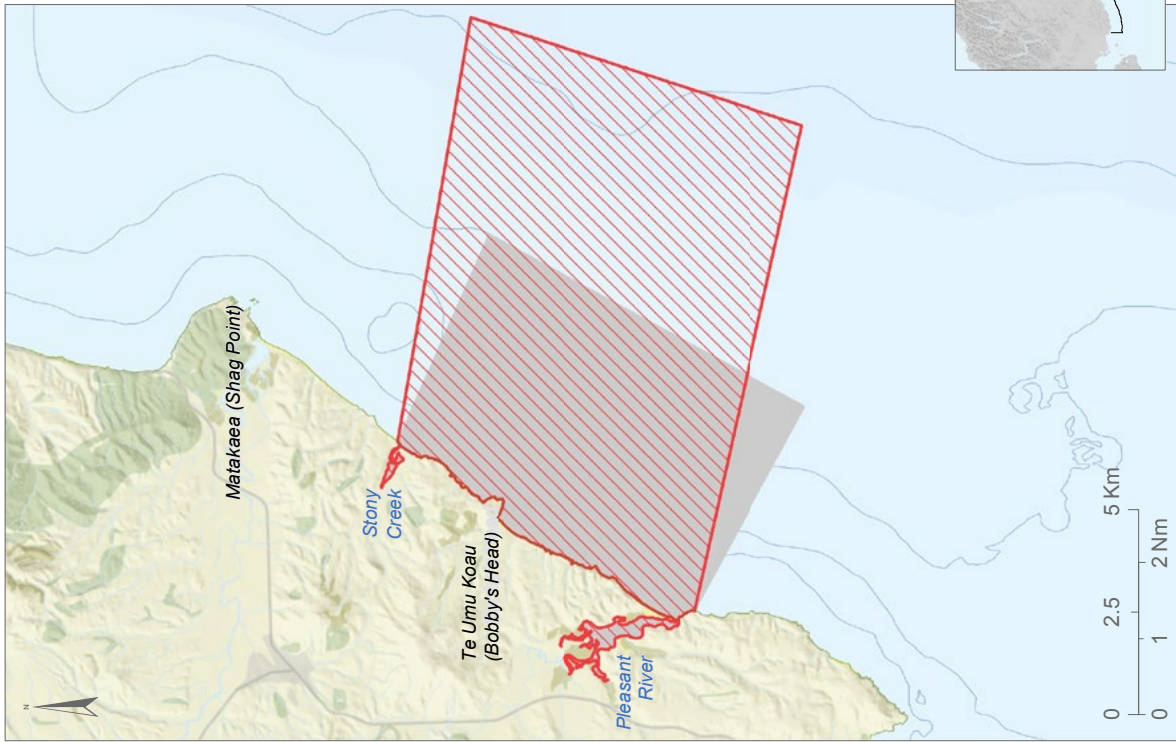
Figure 2-32:
Site D – Bobby's Head
overview map

Two variations of this site are shown: Network 1, Site D1; and Network 2, Site D2.





Network 2, Site D2



Network 1, Site D1



Management areas

-  Marine Reserve
-  Type 2 MPA
-  Consultation area
-  Forum region

comments about enlarging it in general (9 submissions) as 23 requested offshore extension (beyond the proposed boundary), eight of which specified the 12 NM limit to encompass deeper habitats.

The commercial and recreational submitters supported the inshore extent of Site D2 only because of the negative impact that going further offshore would have on the kōura papatea (rock lobster) industry.

Those in support of this site considered the location important for biodiversity, including *Macrocystis* kelp forests and subtidal reef habitat. A significant number of these submitters recommended that the area in question be extended (up to 12 NM) in order to include more deep reef and deep mud habitats. Conversely, recreational fishing submissions largely supported the smaller reserve and sought that the Pleasant River Estuary be excluded.

Table 2-17 shows the positions of pro forma and individual submitters in relation to Site D.

Table 2-17: Summary of submissions for Site D

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1781	0	181
Individual	258	44	99
Total	2039	44	280

2.4.5.4 ANALYSIS OF SITES D1 & D2

Table 2-18: Site D1 and D2 analysis – Meeting the Policy requirements

	Site D1 Pleasant River to Stony Creek – Network 1	Site D2 Pleasant River to Stony Creek – Network 2
Description	<p>A coastal Marine Reserve that extends beyond the outer edge of the deep reef, incorporating the giant bladder kelp (<i>Macrocystis</i>) forest. The reserve extends from mean high water springs to a straight-line outer boundary that ranges between 10 km and 12 km offshore. It covers approximately 96 km² and includes 1.1% of the Forum region.</p> <p>Network 1 includes both the Stony Creek and Pleasant River Estuaries.</p>	<p>A coastal Marine Reserve that extends to the outer edge of the giant bladder kelp (<i>Macrocystis</i>) forest. The reserve extends from mean high water springs to a straight-line outer boundary that ranges between 1.5 km and 2 km offshore. It covers approximately 15.3 km² and includes 0.2% of the Forum region.</p> <p>Network 2 does not include the Stony Creek and Pleasant River Estuaries.</p>
Relationship to Consultation Document	<p>Network 1 includes an approximately 4 km extension from the initial consultation area. It also alters the angle of the offshore boundaries, shifting the reserve slightly north.</p>	<p>Network 2 includes the same coastal boundaries that were consulted on but excludes the estuaries.</p>
Recommended management tool(s) ¹⁴³ / protection standard	<p>Marine Reserve</p> <p>Network 1 proponents consider that an extension is necessary as:</p> <ul style="list-style-type: none"> • The original Site D location only partly met the protection standard because the reserve boundary cut the reef, meaning that only lower trophic levels, sedentary or less mobile species were protected. • The offshore extension allows for the MPA to be more likely to meet the protection standard in terms of providing for the maintenance and recovery of ecological systems, natural species compositions (including all life-history stages) and trophic linkages at the site. 	<p>Marine Reserve</p>

¹⁴³ For further details on existing management tools in the Forum region, see Section 2.3.

	Site D1 Pleasant River to Stony Creek – Network 1	Site D2 Pleasant River to Stony Creek – Network 2
<p>Representative (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data</p>	<p>Network 1 proponents consider that Site D1 includes seven coastal habitat types that contribute to the network’s representativeness, and one habitat type (Moderate Shallow Sand) that while present is unlikely to contribute.</p> <ul style="list-style-type: none"> • Deep Reef: 4.5% of this habitat type within the region. Represents the deep reef north of the Otago Peninsula. This is the only proposal that includes this habitat type in a Marine Reserve. • Moderate Intertidal Reef: 3.6% of this habitat type within the region. Represents the habitat to the north of the region. This is the only site that Network 1 proponents consider contributes to representation of this habitat type. • Moderate Sandy Beach: 3.2% of this habitat type within the region. Represents the biodiversity of this broad-scale habitat type north of the Otago Peninsula. This is the only proposal that includes this habitat type and so there are no replicates. • Moderate Shallow Mud: 7.6% of this habitat type within the region. Represents the biodiversity of this broad-scale habitat type well in deeper parts of the region (>20 m depth), but not the shallow parts (<10 m depth). • Moderate Shallow Reef: 24.8% of this habitat type within the region. Represents this broad-scale habitat type well to the north of the Otago Peninsula. This is the only site that Network 1 proponents consider contributes to representation of this habitat type. • Deep Mud: 7.4% of this habitat type within the region. Represents this habitat type inshore, but not the offshore extent. • Deep Sand: 0.8% of this habitat type within the region. A small but important contribution to representation. Will not represent the biodiversity associated with this broad-scale habitat type on its own. • Moderate Shallow Sand: 0.1% of this habitat type within the region. Will not represent the biodiversity associated with this broad-scale habitat type. This is the only proposal that includes this habitat type within a Marine Reserve. <p>Network 1 proponents also consider that the estuaries that are included provide suitable representation of estuaries in the network. The two estuaries that are recommended constitute 5.8% of the estuarine habitat in the region.</p>	<p>Network 2 proponents consider that Site D2 includes three habitats that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Moderate Shallow Reef: 12.5% of this habitat type within in the region. This is the only proposal that includes this habitat type in a Marine Reserve. • Moderate Intertidal Reef: 3.6% of this habitat type within the region. This is the only proposal that includes this habitat type and so there are no replicates. • Moderate Sandy Beach: 3.2% of this habitat type within the region. This is the only proposal that includes this habitat type in a Marine Reserve.

	Site D1 Pleasant River to Stony Creek – Network 1	Site D2 Pleasant River to Stony Creek – Network 2
Kāi Tahu cultural assessment ¹⁴⁴	<p>There are no Māori lands adjacent to Sites D1 or D2, although there is a significant pā site at the Huriawa Peninsula (Karitāne). Māori land and Puketeraki Marae are located just to the south of Karitāne, while a fisheries landing reserve in Hawkesbury Lagoon is located adjacent to the northern end of Waikouaiti Beach (south of Sites D1 and D2).</p> <p>To the north of Sites D1 and D2, there is a prominent reef and fishery off the mouth of the Waihemo (Shag River) known as Arai-te-uru (Danger Reef). This is an area that is steeped in tradition and associated with the wreck of the Arai-te-uru waka.</p> <p>A significant archaeological (moa hunter) site is also located north of Sites D1 and D2 at the mouth of the Waihemo (Shag River).</p> <p>There are high customary fisheries interests to the north of Sites D1 and D2 (Waihemo (Shag River) Estuary and Matakaea (Shag Point)) and to the south of the proposed area (Matainaka, Waikouaiti Estuary). There are also known to be good fishery and kaimoana resources within the proposed Marine Reserve.</p> <p>Whānau, hapū and fishers</p> <p>The local rūnaka have an established (20-year-old) taiāpure over fishery areas of critical interest to them. However, this does not define the extent of such interest and the rūnaka seek to maintain an active management role over any reserve located in their rohe moana. This taiāpure is located to the south of Sites D1 and D2, commencing at Matainaka Point and extending south to Potato Point. The taiāpure is administered under the mana of Kāti Huirapa Rūnanga ki Puketeraki. Kāti Huirapa Rūnanga ki Puketeraki can point to nearly two decades of successful, modern, inclusive fisheries and habitat management within the East Otago Taiāpure.</p> <p>Customary use, mātauraka, manaakitaka and commercial fishers</p> <p>The Site D area is fished by Kāi Tahu commercial fishers. None of these fishers were opposed to Site D2, but opposition was expressed to the larger version of Site D that was consulted on.</p> <p>Te Rūnanga o Ngāi Tahu stated that this site would have a significant impact on the customary commercial and non-commercial fisheries. However, in principle, Te Rūnanga o Ngāi Tahu support the establishment of a Marine Reserve at Site D2.</p> <p>Manawhenua seek an active role should Sites D1 or D2 proceed. This desire is likely to be the most significant issue for Kāi Tahu in the Kāti Huirapa rohe moana. From Onewhenua (where the canoe Araiteuru rests) through to Purehurehu, this part of the coastline of Kāti Huirapa (including its associated estuaries, rivers and streams) has always sustained the manawhenua. In principle, Kāti Huirapa Rūnanga ki Puketeraki are not opposed to MPAs in their rohe.</p> <p>If such an area was to be established, the following should be considered:</p> <ul style="list-style-type: none"> • Kāti Huirapa Rūnanga ki Puketeraki will not relinquish their sovereignty over their rohe moana, and therefore would continue to manage any Marine Reserve placed within their area (potentially in conjunction with stakeholders and using the taiāpure model). • Kāti Huirapa Rūnanga ki Puketeraki are of the view that relevant legislation needs to be changed to allow the taiāpure to respond more quickly to increased pressure caused displacement from any area that has previously been accessed by recreational fishers. 	

¹⁴⁴ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

	Site D1 Pleasant River to Stony Creek – Network 1	Site D2 Pleasant River to Stony Creek – Network 2
Adverse impacts on existing users	<p>Commercial fishing¹⁴⁵</p> <ul style="list-style-type: none"> Major commercial fishing in the area includes kōura papatea (rock lobster) potting, line fishing and rawaru (blue cod) potting. SeaSketch reporting estimates that 15.5% of the kōura papatea (rock lobster) fishery will be displaced as a result of Site D1. This includes 22.4% of high-intensity fishing grounds. Because of the high value of kōura papatea (rock lobster), there is the potential that the proposed Marine Reserve will have relatively high economic impacts. The proposal intentionally avoids encompassing all reef areas, allowing kōura papatea (rock lobster) fishing to still occur within the greater reef system. In addition, the majority of kōura papatea (rock lobsters) caught within this area are migratory and therefore likely to be available at some other stage of their life when they move outside the reserve. Impacts to the kōura papatea (rock lobster) fishery will include a displacement of effort and reduced access to specific size classes. <p>Based on SeaSketch reporting, the top four fisheries that will be displaced by Site D1 are:</p> <ul style="list-style-type: none"> Pot – kōura papatea (rock lobster): 15.5% Line¹⁴⁶: 2% Pot – rawaru (blue cod): 1.5% Trawl – kumukumu (red gurnard): 1.5%. <p>Noting the limitations set out in Section 2.4.1, MPI estimates:</p> <ul style="list-style-type: none"> The export value of potentially displaced fisheries at \$2.4 million, based on a volume of 40,539 kg of fish. Of this, the main displacement would occur in the: <ul style="list-style-type: none"> Kōura papatea (rock lobster) potting fishery – 18,975 kg, with an export value of \$2.2 million Rawaru (blue cod) potting fishery – 2,550 kg, with an export value of \$42,800 Pātiki (flatfish) trawl fishery – 2,600 kg, with an export value of \$19,000 Kumukumu (red gurnard) trawl fishery – 2,282 kg, with an export value of \$15,600 Blue moki set net fishery – 2,050 kg, with an export value of \$12,700 Moko repe (elephant fish) trawl fishery – 1,800 kg, with an export value of \$9,600. 	<p>Commercial fishing</p> <ul style="list-style-type: none"> Major commercial fishing in the area includes kōura papatea (rock lobster) potting, pāua diving and rawaru (blue cod) potting. The extension that is included in Site D1 will have a significantly higher impact than that of D2. SeaSketch reporting estimates that 5.8% of the kōura papatea (rock lobster) fishery will be displaced as a result of Site D2. This includes 8.4% of high-intensity fishing grounds. Because of the high value of kōura papatea (rock lobster), there is the potential that the proposed Marine Reserve will have relatively high economic impacts. Impacts to the kōura papatea (rock lobster) fishery will include a displacement of effort and reduced access to specific size classes. Commercial fishers have observed over many years that kōura papatea (rock lobster) can be tracked when they move and therefore closing an extensive area for an offshore Marine Reserve will affect the fishers' capability to follow movement and annual migrations. <p>Based on SeaSketch reporting, the top four fisheries that will be displaced by Site D2 are:</p> <ul style="list-style-type: none"> Pot – kōura papatea (rock lobster): 5.8% Line: 0.8% Dive – pāua: 0.5% Pot – rawaru (blue cod): 0.2%. <p>Noting the limitations set out in Section 2.4.1, MPI estimates:</p> <ul style="list-style-type: none"> The export value of potentially displaced fisheries at \$1.1 million, based on a volume of 11,503 kg of fish Of this, the main displacement would occur in the potting fisheries for: <ul style="list-style-type: none"> Kōura papatea (rock lobster) – 9,020 kg, with an export value of \$1.1 million Rawaru (blue cod) – 531 kg, with an export value of \$8,800.

¹⁴⁵ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁴⁶ Bottom longline and dahn line.

	Site D1 Pleasant River to Stony Creek – Network 1	Site D2 Pleasant River to Stony Creek – Network 2
Adverse impacts on existing users continued	<p>Commercial fishing continued</p> <ul style="list-style-type: none"> • Fifty-six fishers pot in this area, or the statistical area within which Site D1 is located, with an average total of 1,319 potting events in this area per year. • Thirty-one fishers trawl in this area, with an average total of 115 trawl events at Site D1 per year. • A total of 86 commercial fishers are thought to fish in this area or in the wider statistical area within which Site D1 is located, among whom: <ul style="list-style-type: none"> ◦ Six fishers have catches of 2,000 kg or more which could be displaced, affecting between 2.1% and 11.3% of the individual fishers' catch within the relevant quota management areas. ◦ The individual fishers with the top three maximum displacements of catch by volume could be: <ul style="list-style-type: none"> - 7,086 kg (7.7% of the fishers' catch) - 5,698 kg (4% of the fishers' catch) - 4,198 kg (11.3% of the fishers' catch). ◦ Sixty-one fishers would have 1% or less of their catch within the relevant quota management areas displaced. • MPI does not have sufficient information from which to estimate displacement for the eel fishery. However, the tuna (eel) fishing industry submission¹⁴⁷ stated that the maximum annual catch for Site D1 would be 4.5 tonnes, with a median of 1.5 tonnes annually. This amounts to 5.2% displacement of the total allowable catch for the relevant tuna (short fin eel) quota management area based on the median. 	<p>Commercial fishing continued</p> <ul style="list-style-type: none"> • Fifty-six fishers pot in this area, or the statistical area within which Site D2 is located, with an average total of 1,319 potting events in this area per year. • A total of 73 commercial fishers are thought to fish in this area or in the wider statistical area within which Site D2 is located, among whom: <ul style="list-style-type: none"> ◦ One fisher has a catch of 2,000 kg or more which could be displaced. ◦ This fisher could have a displacement by volume of: <ul style="list-style-type: none"> - 2,416 kg (1.7% of the fisher's catch within the relevant quota management areas) ◦ Sixty-six fishers would have 1% or less of their catch within the relevant quota management areas displaced. • Since the estuaries are not included in Site D2, there is no impact on tuna (eel) fisheries.
	<p>Recreational fishing</p> <p>Sports fishing and game bird shooting will be prohibited in the estuaries.</p>	<p>Recreational fishing</p> <p>D2 will have minimal adverse impact on the recreational sector. Any extensions to the proposed area will increase the cumulative impacts from closures and restrictions (for both the recreational and commercial sectors).</p> <p>Some recreational fishers do not agree with the closure of the estuaries, observing that any exclusion from the estuaries will impact on sports fishing and game bird shooting.</p>

¹⁴⁷ Commercial Eel Fishing Industry Submission #1957.

	Site D1 Pleasant River to Stony Creek – Network 1	Site D2 Pleasant River to Stony Creek – Network 2
Other impacts	<p>Accessibility</p> <p>There are four main attractions in this area, all of which offer different experiences of the coastline scenery and geomorphology:</p> <ul style="list-style-type: none"> • Te Umu Koau (Bobbys Head)/Tavora is accessible from Goodwood Road, and features a hoiho (yellow-eyed penguin) reserve and koau (Otago shag) nesting sites. There is also a short walk through a revegetated area to the sandy beach where a stream discharges. • Stony Creek’s sandy beach and small estuary, off Bushy Hill Road and Anderson Road, can be accessed via a short walk through a private covenanted wetland. • Cliffs at various points along the coast disrupt walking the length of Site D1’s shoreline. • Pleasant River Estuary is an impressive maze of channels and mudflats, and much of it is exposed at low tide. <p>Land owned by the Yellow-Eyed Penguin Trust can be accessed at Tavora – although continuous year-round access is not guaranteed (at times it is closed in the summer for seasonal management purposes).</p>	<p>Accessibility</p> <p>There are three main attractions in this area, all of which offer different experiences of the coastline scenery and geomorphology:</p> <ul style="list-style-type: none"> • Te Umu Koau (Bobbys Head)/Tavora is accessible from Goodwood Road, and features a hoiho (yellow-eyed penguin) reserve and koau (Otago shag) nesting sites. There is also a short walk through a revegetated area to the sandy beach where a stream discharges. • Stony Creek’s sandy beach, off Bushy Hill Road and Anderson Road, can be accessed via a short walk through a private covenanted wetland. • Cliffs at various points along the coast disrupt walking the length of Site D2’s shoreline.
	<p>Benefits</p> <ul style="list-style-type: none"> • Potential benefits for high school / university education groups – less so for younger children as the location is too remote and not easily accessible for children. • Direct benefits for wildlife tourism (particularly regarding the protection of hoiho (yellow-eyed penguins)), with good potential for on-site interpretation, diving and coastal walks based at Tavora, which is close to Dunedin. • Indirect benefits for wildlife tourism (pahu (Hector’s dolphins), penguins and other seabirds) in Tavora and the surrounding region. • Increased recreational and amenity values, with Te Umu Koau (Bobbys Head) and Stony Creek providing walking access through revegetated protected areas to scenic cliffs and beaches. • Tourism, from land or water, has the potential to bring more visitors to the area. 	<p>Benefits</p> <ul style="list-style-type: none"> • Potential benefits for high school / university education groups – less so for younger children as the location is too remote and not easily accessible for children. • Direct benefit potential for on-site interpretation, diving and coastal walks based at Tavora, which is close to Dunedin. • Increased recreational and amenity values, with Te Umu Koau (Bobbys Head) and Stony Creek providing walking access through revegetated protected areas to scenic cliffs and beaches. • Tourism, from land or water, has the potential to bring more visitors to the area.
Adverse effects	<ul style="list-style-type: none"> • Increasing visitor numbers might impact on the hoiho (yellow-eyed penguin) colony. • Duck shooters may be affected. • Trout fishers will be affected. 	<ul style="list-style-type: none"> • Increased tourism may cause damage from excessive anchoring and unintentional damage caused by dive fins and handling specimens. • Increasing visitor numbers might impact on the hoiho (yellow-eyed penguin) colony.

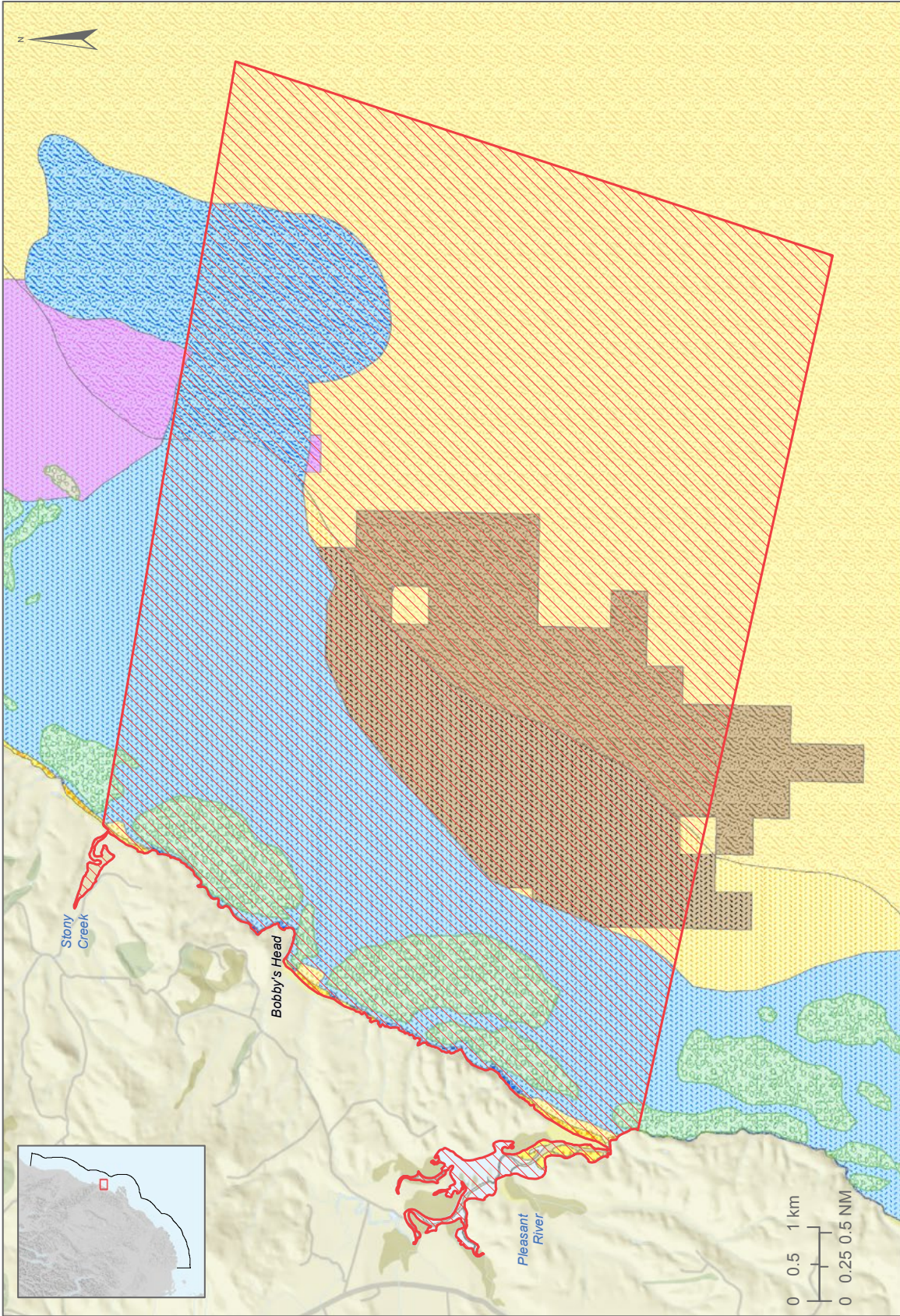


Figure 2-33: Broad-scale habitat map for Site D1 - Bobby's Head

** For legend, see inside back cover.*

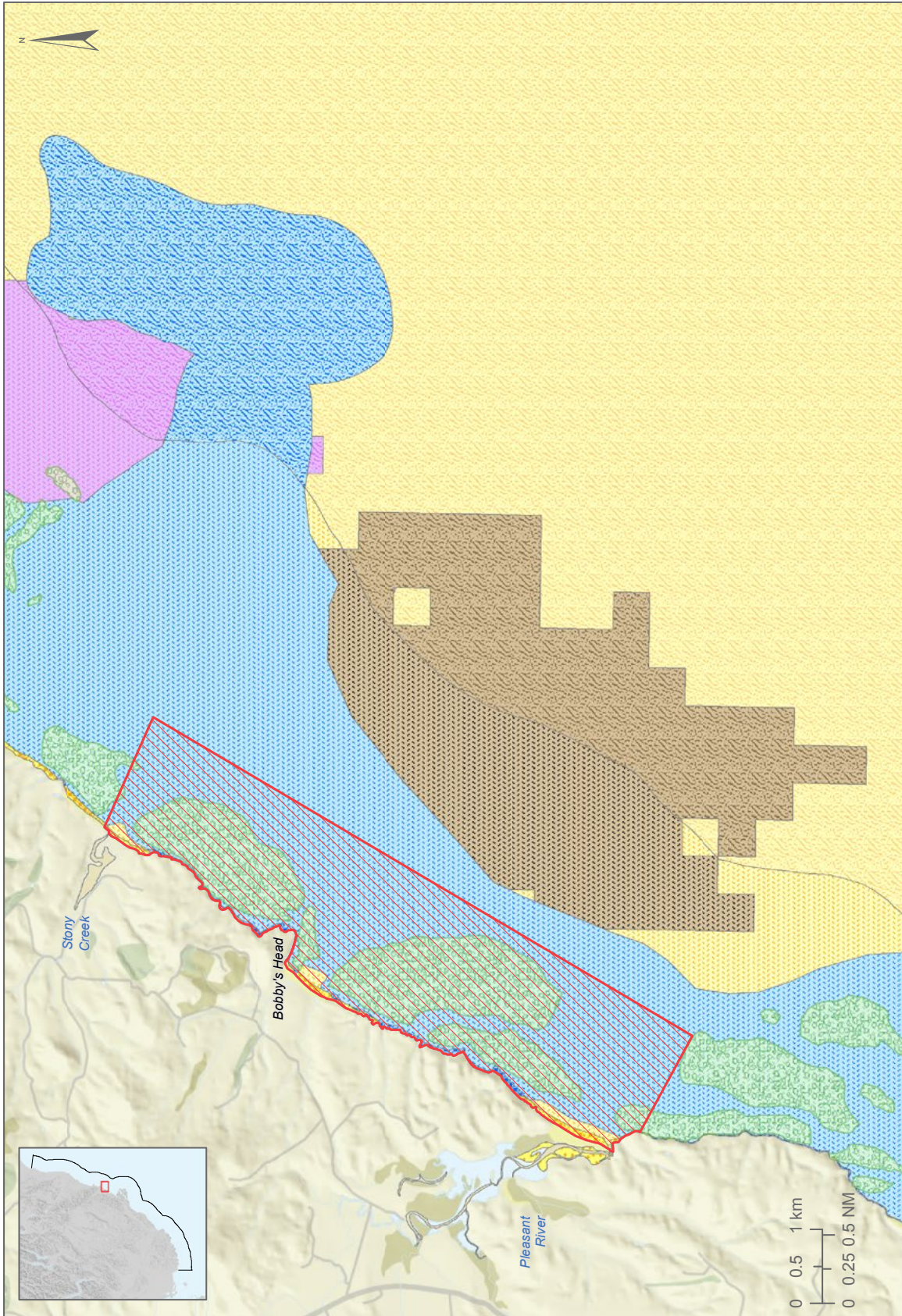
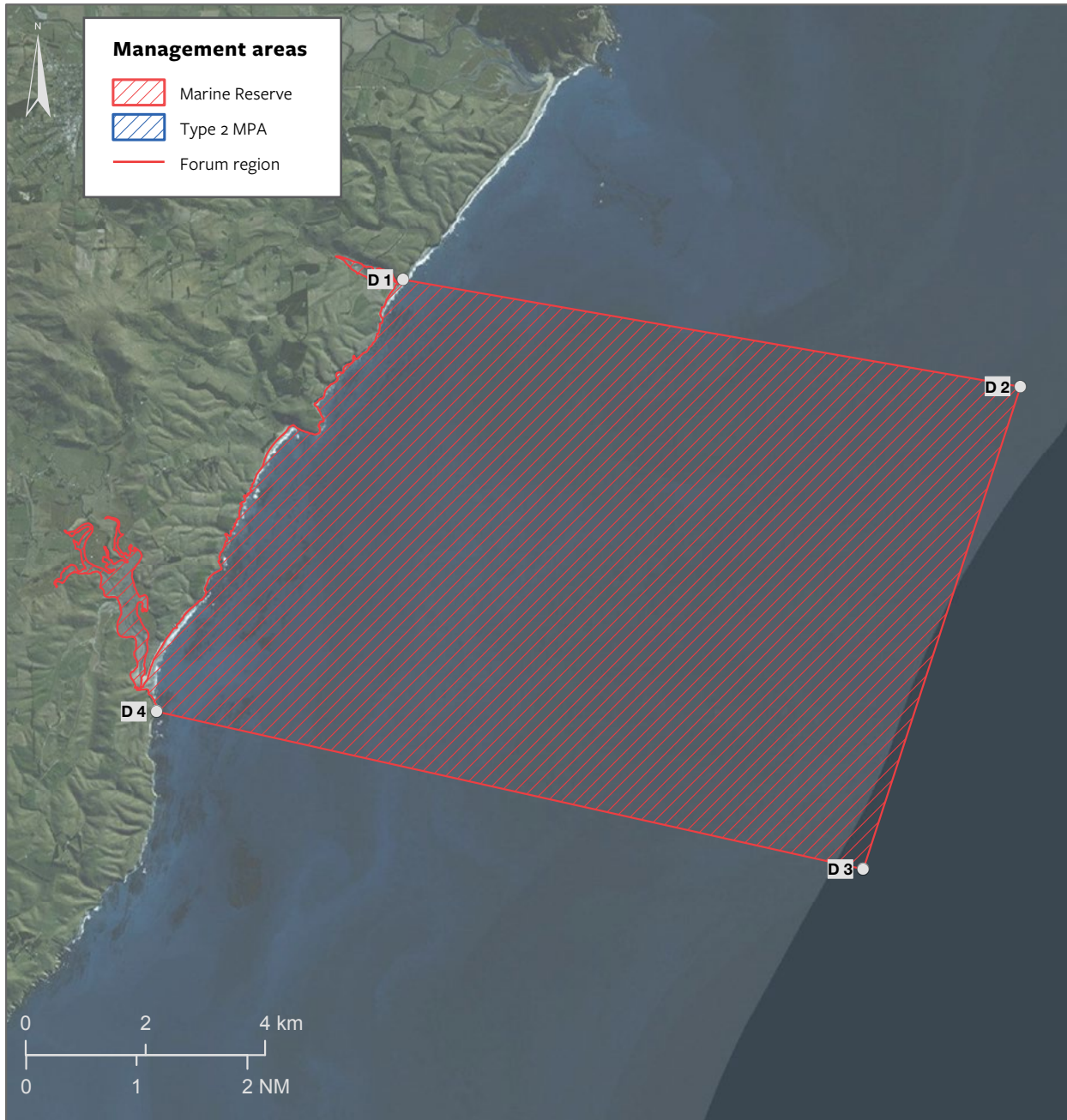


Figure 2-34: Broad-scale habitat map for Site D2 – Bobby's Head

** For legend, see inside back cover.*

Figure 2-35: Location map for Site D1 – Bobby’s Head



Index to Boundary Points		
Vertices	Latitude	Longitude
D 1	45° 30.550' S	170° 47.114' E
D 2	45° 31.668' S	170° 55.012' E
D 3	45° 35.994' S	170° 52.829' E
D 4	45° 34.395' S	170° 43.787' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
D1-D2	10491	5.665
D2-D3	8527	4.604
D3-D4	12127	6.548

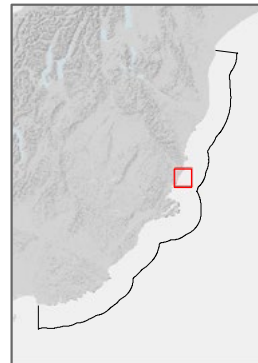
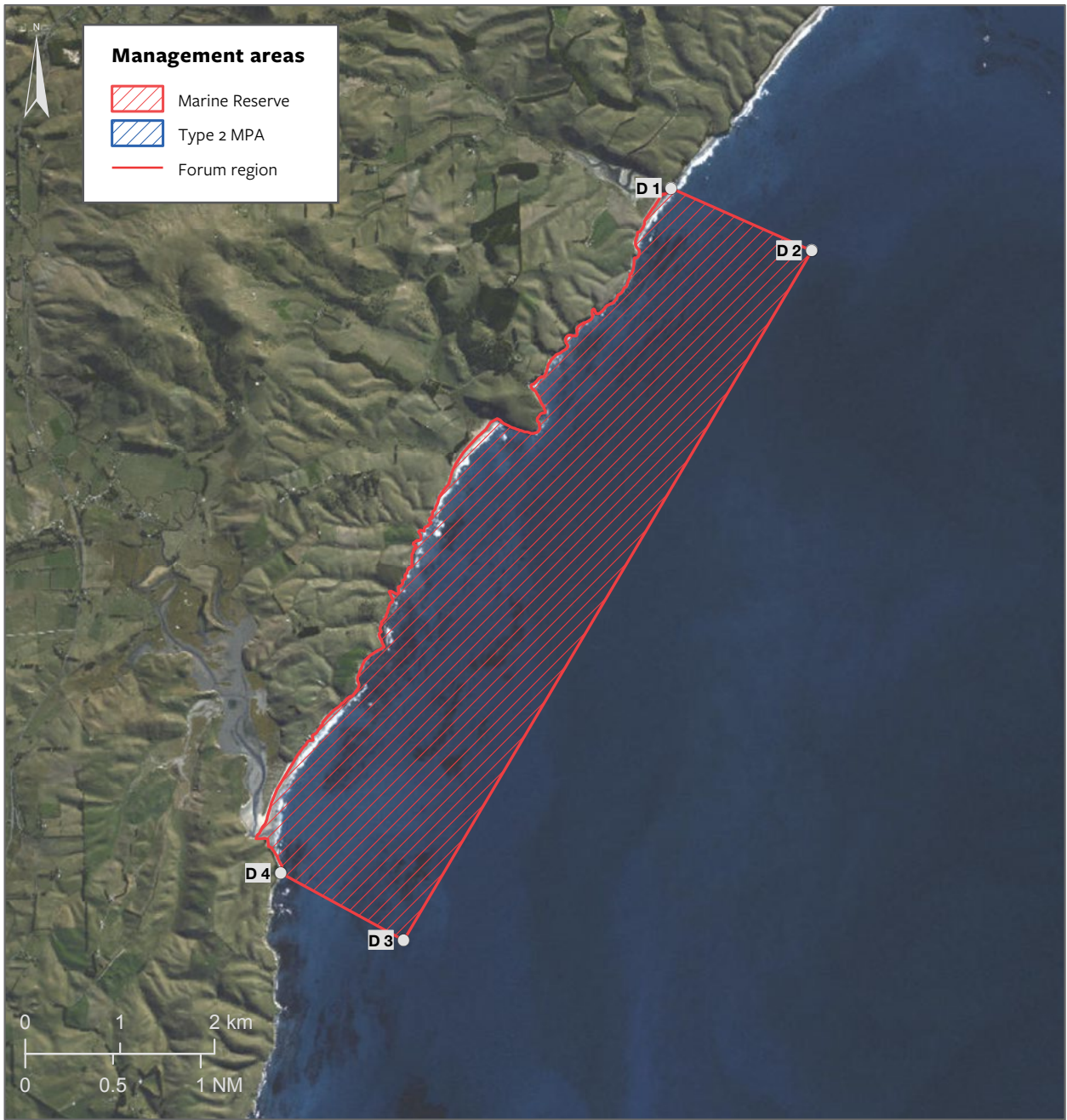


Figure 2-36: Location map for Site D2 - Bobby's Head



Index to Boundary Points		
Vertices	Latitude	Longitude
D1	170° 47.111' E	45° 30.550' S
D2	170° 48.237' E	45° 30.927' S
D3	170° 44.770' E	45° 34.795' S
D4	170° 43.786' E	45° 34.392' S

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
D1 - D2	1625	0.877
D1 - D4	10327	5.576
D2 - D3	8468	4.572
D4 - D3	1482	0.800



2.4.6 Saunders Canyon & Surrounds and Papanui Canyon – Sites E1 (Type 2) & H1 (Marine Reserve)

2.4.6.1 OVERVIEW

Site E is only included in Network 1, whereas Site H is included in both networks but covers different-sized areas (note: Site H2 is discussed in Section 2.4.7).

Network 1 proponents recommend the establishment of a Type 2 MPA at Site E1 in conjunction with a Marine Reserve at Site H1. Site E1 includes Saunders Canyon, the plateau between Saunders and Papanui Canyons, and bryozoan thickets, while Site H1 includes bryozoan thickets and Papanui Canyon (Figure 2–37).

Both Sites E1 and H1 were included in the Consultation Document. However, the size of the Marine Reserve over Papanui Canyon (Site H in the Consultation Document) has been enlarged, making it more comparable in size to the Marine Reserve that was previously consulted on over Saunders Canyon.

2.4.6.2 WHY THESE SITES HAVE BEEN RECOMMENDED

The biodiversity around the Otago Peninsula is strongly influenced by the Southland Current being ‘squeezed’ between the peninsula and canyons, creating a diverse oceanographic environment. The Forum recognises the special biodiversity values associated with the continental shelf and canyons found off the Otago Peninsula.

Canyons

The Forum considers that the Saunders and Papanui canyons are unique features of the region and warrant protection.

Some Forum members consider that protecting Saunders Canyon in a Marine Reserve will provide more biodiversity benefits than protecting Papanui Canyon. This is largely because the head of Saunders Canyon extends further into the territorial sea, and so a greater area, range of depths and number of habitat types associated with this greater topographic complexity would be protected. However, Papanui Canyon has been put forward as a compromise recommendation due to commercial, recreational and Kāi Tahu fishing interests. The establishment of a Type 2 MPA at Site E1 allows the habitats that occur at Site H1 to be replicated and provides a level of protection of Saunders Canyon.

This area contains the canyon walls and head, and deep-water reef and soft-sediment habitats. It also contains bryozoan habitat, which is nationally and internationally important due to the high proportion of endemic species it supports.¹⁴⁸

Three water masses mix in this area (neritic, subtropical and subantarctic), making this a rare and internationally significant area in an oceanographic context and for the ecosystems that are reliant on this mixing.

The communities in this high-flow area, with mixing water masses and significant changes in benthic topography, are also nationally and internationally significant.

¹⁴⁸ Wood, A. and Probert, K. 2003. “Bryozoan-dominated benthos of Otago shelf, New Zealand: its associated fauna, environmental setting and anthropogenic threats,” *J. R. Soc. New Zeal.*, vol. 43, no. 4, p. 231–249.

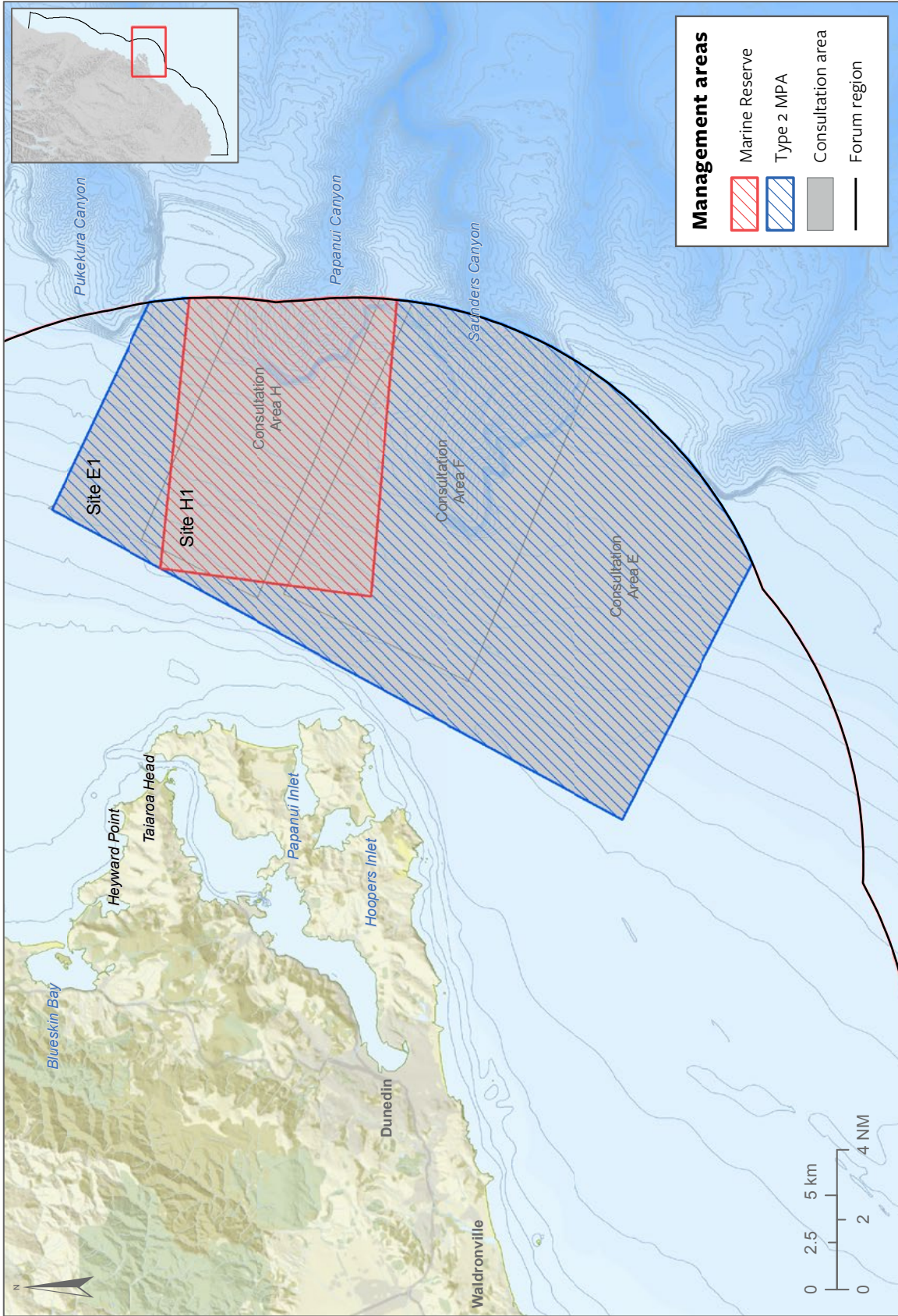


Figure 2-37: Network 1 Sites E1 & H1 Overview map
Saunders Canyon & Surrounds, Papanui Canyon and shelf plateau

Bryozoan

The bryozoan beds (shown in grey in Figure 2-38) represent an important biogenic habitat that has been identified off the Otago Peninsula. Biogenic habitats such as this create habitat for diverse invertebrate communities (e.g. sponges, anemones, worms, crabs, snails, sea stars and sea squirts) and juvenile fish. It is considered that the bryozoan thickets off the Otago Peninsula meet the definition of *'outstanding, rare, distinctive or internationally or nationally important marine habitats and ecosystems'* as mentioned in the MPA Policy.

The bryozoan species that create these beds tend to change with depth and sediment type across the continental shelf. Likewise, the many different invertebrate species that are associated with the bryozoan thickets also change as one moves from the shallower depths to deep water (i.e. there is longitudinal / cross-shelf variability).

The narrowing of the continental shelf off Otago Peninsula and the abundance of organisms that use the bryozoans as habitat also create feeding grounds for some larger vertebrates such as rāpoka (New Zealand sea lions) and hoiho (yellow-eyed penguins), which target the waters over the bryozoans.

All Forum members recognise the value of the bryozoan beds and agree that they should be protected in some way. There is an existing voluntary no-trawl area over some of the area where Bryozoan is known to be most abundant. The level and extent of protection is documented in this site description (associated with Network 1) and that for Site G2 (associated with Network 2) in Section 2.4.7.

Plateau

The plateau between the canyons is influenced by the Southland Current and the upwelling that likely occurs from deeper waters up through the canyons.

Little is currently known about what lives in the plateau area. However, based on the upwelling and the knowledge that this is one of the few areas within the Forum region where tupa (scallops) occur, this is expected to be a very productive area and potentially an area of high biodiversity.

Foraging area for iconic protected and high-trophic-level species

The areas included within this proposal are inhabited by rāpoka (New Zealand sea lions), hoiho (yellow-eyed penguins), kekeno (New Zealand fur seals), and more than 37 species of sharks and rays, including protected species such as mako taniwha (great white sharks) and mako (basking sharks). Some 53 species of seabirds are also known to forage here, including eight threatened species, three of which are classified as Nationally Critical. The restrictions would protect important habitat for these species and its associated biodiversity (which is the reason why these animals occur there), and reduce the potential for incidental fisheries captures, particularly by set nets, thus helping to maintain the rich diversity of large animals that utilise the area. In particular, hoiho (yellow-eyed penguins) and koau (Otago shags), both of which already have low population numbers, are considered to be at medium risk of capture in set nets. In addition, four species of toroa (albatross) have been assigned as being at very high risk of incidental catch in fisheries, while a further two species of toroa (albatross) are considered at high risk, and five species of shags and petrels are considered at medium risk.¹⁴⁹

¹⁴⁹ Richard, Y.; Abraham E.R. 2015: Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006-2007 to 2012-2013. <http://fs.fish.govt.nz/Doc/23979/AEBR-162-risk-assessment.pdf.ashx>

2.4.6.3 WHAT SUBMITTERS SAID

The majority of submitters supported Site E as contained in the Consultation Document and opposed Site H. The boundaries of Sites E1 and H1 have been altered in Network 1 as a consequence of the consensus for a Marine Reserve over Papanui Canyon rather than Saunders Canyon, and these changes have not been specifically consulted on. However, the areas covered by Site E and Papanui Canyon were consulted on separately.

Those who supported Site E noted its importance for protecting bryozoan and canyon habitats, and providing a buffer for a Marine Reserve at Saunders Canyon. More than 50 individual submissions also considered that the area should be a Marine Reserve, or extended inshore to connect with the coast or southwards to include the deep gravel foraging area for hoiho (yellow-eyed penguins).

Those who opposed Site E considered that there would be negative impacts on commercial fishing and that rebalancing would be required. Several commercial submissions were concerned that it would remove much of the queen scallop (*Aequipecten opercularis*) fishery and 7.2% of the region's line fishery. One submitter also stated that Site E could displace at least 50% of their mako (school shark and rig) catch.

The Summary of Science Submissions showed that a high intrinsic value was placed on the bryozoan communities (53 statements in the Site E response area and 29 in the Site F response area), and a high value was also associated with the research and education opportunities presented by enacting an MPA. The importance of the area to marine mammals and birds with public, no-take access for enjoyment was also prominent among submitter concerns. Recreational selective fishing methods with low bycatch potential and low bottom-disturbance risks (i.e. hook and line, potting) were generally supported, but there was an overall feeling that there should be increased restrictions on bulk methods and commercial take (26 submissions requested more restrictions than proposed). Marine Reserve protection of Saunders Canyon (29 statements in the Site E area and 34 in the Site F area) was requested over Papanui Canyon for reasons including its greater area, increased habitat heterogeneity, more complex bathymetry and the blending of protection areas (E and F) to increase network value.

Tables 2-19 and 2-20 show the positions of pro forma and individual submitters in relation to Sites E and H.

Table 2-19: Summary of submissions for Site E

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1225	735	1
Individual	174	111	32
Total	1399	846	33

Table 2-20: Summary of submissions for Site H

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	737	1224	0
Individual	224	90	29
Total	961	1314	29

2.4.6.4 ANALYSIS OF NETWORK 1 SITES E1 & H1

Table 2–21: Site E1 & H1 analysis – Meeting the Policy requirements

	Site E1 Saunders Canyon & Surrounds and Site H1 Papanui Canyon – Network 1
Description	<p>Site E1:</p> <ul style="list-style-type: none"> Starts approximately 2 km from the coast at Cape Saunders and extends to the 12 NM territorial sea limit. It extends 36 km north to south. A total of 450 km² is included in this site. The inshore boundary incorporates the known landward extent of the Bryozoans habitat type. Includes the entirety of Saunders Canyon, some adjacent plateau habitat and the majority of the habitat-forming bryozoans that are not incorporated into Site H1. <p>Site H1:</p> <ul style="list-style-type: none"> Starts approximately 6 km from the coast at Cape Saunders and extends to the 12 NM territorial sea limit. A total of 167 km² is included in this site.
Relationship to Consultation Document	<p>Site E1:</p> <ul style="list-style-type: none"> Site E1 is entirely encompassed by the original Site E that was contained in the Consultation Document. Boundary modifications around Papanui Canyon mean that it is slightly smaller than the area that was consulted on. <p>Site H1:</p> <ul style="list-style-type: none"> In recommending the protection of Papanui Canyon instead of Saunders Canyon as a Marine Reserve, it was considered necessary to alter the boundaries to include habitats that would otherwise be underrepresented in terms of replication in Network 1. Site H1 is larger than the original Site H that was consulted, but falls entirely within the original consultation sites of E, F and H.
Recommended management tool(s) / protection standard	<p>Site E1:</p> <ul style="list-style-type: none"> A Type 2 MPA that includes the following prohibitions: <ul style="list-style-type: none"> Dredging Set netting Trawling Purse seining Danish seining Bottom disturbance and seismic testing associated with any activity. <p>This site meets the protection standard with the recommended restrictions. It is recommended that set netting be prohibited from Site E1 due to the level of extraction of top predators, and the impacts it has on ecological systems, natural species composition and trophic linkages. The prohibition of set netting is likely to better enable the maintenance and recovery of Site E1’s biological diversity, and increase its resilience. See Section 2.2.3 for further details on recommended protection tools.</p> <p>Site H1:</p> <ul style="list-style-type: none"> Marine Reserve.

Site E1 Saunders Canyon & Surrounds and Site H1 Papanui Canyon – Network 1

Representativeness (sufficient extent and quality to meet the protection standard)¹⁵⁰

Site E1 includes two broad-scale habitat types that contribute to the network's representativeness:

- Deep Water Sand: 72% of this habitat type within the region. This habitat type is specific to the canyons. This site is representative of this habitat type.
- Deep Sand: 5.6% of this habitat type within the region. This area represents the deeper parts of this habitat type well (i.e. beyond 70 m depth), but not the shallower extent that predominates north of Karitāne.

One additional habitat type partially contributes to the network's representativeness:

- Deep Gravel: 0.81% of this habitat type within the region. A relatively small area of gravel between Saunders and Papanui Canyons is included in the site which, along with Site H1, may contribute to representing this part of this broad-scale habitat type.

This site also includes one habitat type that, while present, does not contribute to the network's representativeness:

- Deep Reef: 0.2% of this habitat type within the region. Unlikely to contribute due to its small size and protection type.

Site H1 includes two broad-scale habitat types that contribute to the network's representativeness:

- Deep Sand: 2.8% of this habitat type within the region. Represents the deeper parts of this habitat type (i.e. beyond 70 m depth), but not the shallower extent that predominates north of Karitāne.
- Deep Water Sand: 25% of this habitat type within the region. This habitat type is specific to the canyons. In this case, it relates to Papanui Canyon (with Saunders Canyon being covered by Site E1).

One additional habitat partially contributes to the network's representativeness:

- Deep Gravel: 1.9% of this habitat type within the region. Represents to some degree the deeper parts of this habitat type, but not the shallower extent that occurs to the north and south.

Together, Sites E1 and H1 represent:

- 97% of the Deep Water Sand (canyon) habitat
- 8.4% of the Deep Sand habitat
- 2.7% of the Deep Gravel habitat.

Rare, unique and nationally/international significant habitats

Site E1 includes 65% of the Bryozoans habitat type, while Site H1 includes an additional 30%.

Therefore, together these sites protect 95% of the recorded/known and potential extent of the distribution of habitat-forming bryozoans off the Otago Peninsula.

¹⁵⁰ See Appendix A1.1 for complete habitat data.

Site E1 Saunders Canyon & Surrounds and Site H1 Papanui Canyon – Network 1

Kāi Tahu cultural assessment¹⁵¹

Poatiri (fish hook) is the Māori name for Mount Charles, which is appropriate given the rich traditional fishing grounds that are associated with the place it overlooks, Cape Saunders. Traditional settlements in the Cape Saunders area utilised sheltered anchorages to access the rich fishery in this region. The Crown has returned land at Cape Saunders to the hapū who were the original owners.

Maintaining and enhancing marine ecosystems that contribute to the biodiversity of 'Te Tai o Araiteuru' is an important issue for Kāi Tahu. The fishery and associated ecosystems of the Cape Saunders area are of high importance to Kāi Tahu, local rūnaka, and their associated customary, commercial and recreational fishers.

Kaitiakitaka

The kaitiaki of the customary rights located in the coastal area covered by Sites E1 and H1 is undertaken by the whānau and hapū of Kāi Taoka, Kāti Moki and Kāi Te Pahī, and administered through Te Rūnaka o Ōtākou.

Customary fisheries

The shelf and canyons are similarly considered in terms of customary fisheries. The proximity of these significant canyons and nursery areas has traditionally ensured that the Cape Saunders area of the Otago Peninsula is one of the strongest and most coveted fisheries in the coastal area of Otago.

Traditions include disputes between Kāi Tahu and Kāti Māmoe over sea fishing boundaries, in retaliation to which the tohunga (priest) Putoki, from the northern tip of Cape Saunders, summoned a storm that dispersed the Pukekura fishing fleet of Kāi Tahu.

Significant villages were established on the northern and southern side of Cape Saunders, and at Papanui Inlet for the purpose of accessing the very rich Cape Saunders fishery.

Whānau, hapū and fishers

The local rūnaka have established a mātaītai reserve in the outer Otago Harbour (2016). However, this does not define the extent of such interest nor reduce interest in an active management role within any reserve that is located in their rohe moana.

Ōtākou whānau and hapū have maintained a continuous and active role in all facets of fishery activity, be it customary, commercial or recreational.

Access to and use of the canyon fishery has been a fundamental aspect for Ōtākou commercial and recreational / customary fishers.

¹⁵¹ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

Site E1 Saunders Canyon & Surrounds and Site H1 Papanui Canyon – Network 1

Adverse impacts on existing users

Commercial fishing¹⁵²

Site E1:

Tupa (queen scallops) are no longer harvested from this area. However, it is understood that commercial fishers wish to maintain access.

Existing prohibitions on Danish seining and set netting apply to some of the proposed MPA.¹⁵³

Based on SeaSketch reporting, the top three fisheries that will be displaced by Site E1 are:

- Net – mako (school shark): 8.9%
- Net – other: 2.9%
- Net – mako (rig): 2.1%.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$76,000, based on a volume of 16,377 kg of fish.
- Of this, the main displacement could occur in the:
 - Mako (school shark) set net fishery – 6,550 kg, with an export value of \$33,600
 - Mako (rig) set net fishery – 2,194 kg, with an export value of \$13,200
 - Pātiki (flatfish) trawl fishery – 3,640 kg, with an export value of \$2,100.
- Seven fishers set net within Site E1, with an average total of 240 set net events at this site per year.
- Twenty-seven fishers trawl within Site E1, with an average total of 17 trawl events at this site per year.
- A total of 91 commercial fishers are thought to fish in this area or in the wider statistical area within which Site E1 is located.
- No fishers undertake Danish seining or dredging at Site E1.

Site H1:

- One fisher takes up to 20 tonnes of rari (ling) by longlining in this area, but in his submission stated that he would concede to it being closed as a Marine Reserve if access to Saunders Canyon is maintained for longlining and potting.
- Site H1 will cause significant costs if a shift of effort is required. It is uncertain whether it is even possible for some species to be targeted cost-effectively elsewhere if fishers are not able to fish in Papanui Canyon.

Based on SeaSketch reporting, the top fisheries that will be displaced by Site H1 are:

- Line¹⁵⁴: 3.4%
- Jig – muheke (squid): 3.3%
- Pot – rawaru (blue cod): 2.4%.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$126,500, based on a volume of 21,701 kg of fish.
- Of this, the main displacement would occur in the:
 - Rawaru (blue cod) potting fishery – 2,250 kg, with an export value of \$54,300
 - Muheke (arrow squid *Nototodarus* spp.) jig fishery – 8,204 kg, with an export value of \$25,400

¹⁵² All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁵³ Danish seining is prohibited within 3 NM of the coast under reg 70 of the Fisheries (Commercial Fishing) Regulations 2001 and set netting is prohibited within 4 NM of the coast under reg 5AAC of the Fisheries (South-East Area Commercial fishing) Regulations 1986.

¹⁵⁴ Bottom longline and dahn line.

Site E1 Saunders Canyon & Surrounds and Site H1 Papanui Canyon – Network 1

Adverse impacts on existing users continued...

Commercial fishing continued

- Mako (rig) set net fishery – 1,671 kg, with an export value of \$10,100
- Mako (school shark) set net fishery – 1,745 kg, with an export value of \$9,000
- Rari (ling) bottom longline and potting fisheries – 1,273 kg, with an export value of \$5,700.

Forty-six fishers pot in this area, or in the statistical area within which Site H1 is located, with an average total of 587 potting events in this area per year.

- Three fishers jig in this area, or in the statistical area within which Site H1 is located, with an average total of 26 jigging events in this area per year.
- Four fishers set net in this area, with an average total of 99 set netting events at this site per year.
- A total of 64 commercial fishers are thought to fish in this area or in the wider statistical area within which Site H1 is located, among whom:
 - Four fishers have catches of 1000 kg or more that could be displaced, affecting between <0.1% and 4.1% of the individual fishers' catches within the quota management area
 - The individual fishers with the top three maximum displacements of catch by volume could be:
 - 6,078 kg (<0.1% of the fisher's catch)
 - 5,850 kg (4.1% of the fisher's catch)
 - 2,126 kg (0.6% of the fisher's catch)
 - Fifty-five fishers would have 1% or less of their catch within the relevant quota management areas displaced.

Recreational fishing

Site E1:

- This site is not likely to have adverse impacts on recreational users.

Site H1:

- This site will have considerably less impact on recreational fishers than the originally proposed Marine Reserve over Saunders Canyon.
- Impacts will affect a subset of the recreational sports fishing community – an important deep-water fishery that includes charter boat fishers targeting rawaru (blue cod) and bluenose, hapuku (groper), and sharks for tag and return.

Other impacts

Accessibility

- The public will rely on boats to experience this area, including private craft, charter boats and tour vessels. Most trips will originate from Otago Harbour.
- Access for smaller craft (vessels of approximately 5 m plus) will be possible from a variety of locations.
- Access will be very weather dependent.

Benefits

- Dunedin's international reputation for nature tourism would be bolstered as the sea off the Otago Peninsula is a hotspot for threatened marine fauna.
- Benthic ecosystems on the shelf and bryozoan beds are of high value scientifically and have been the subject of research for more than 50 years. The accessibility of different water masses on the shelf is likely unique in the world and provides significant opportunities for research on pelagic systems, pelagic benthic coupling, marine birds / mammals and climate change.

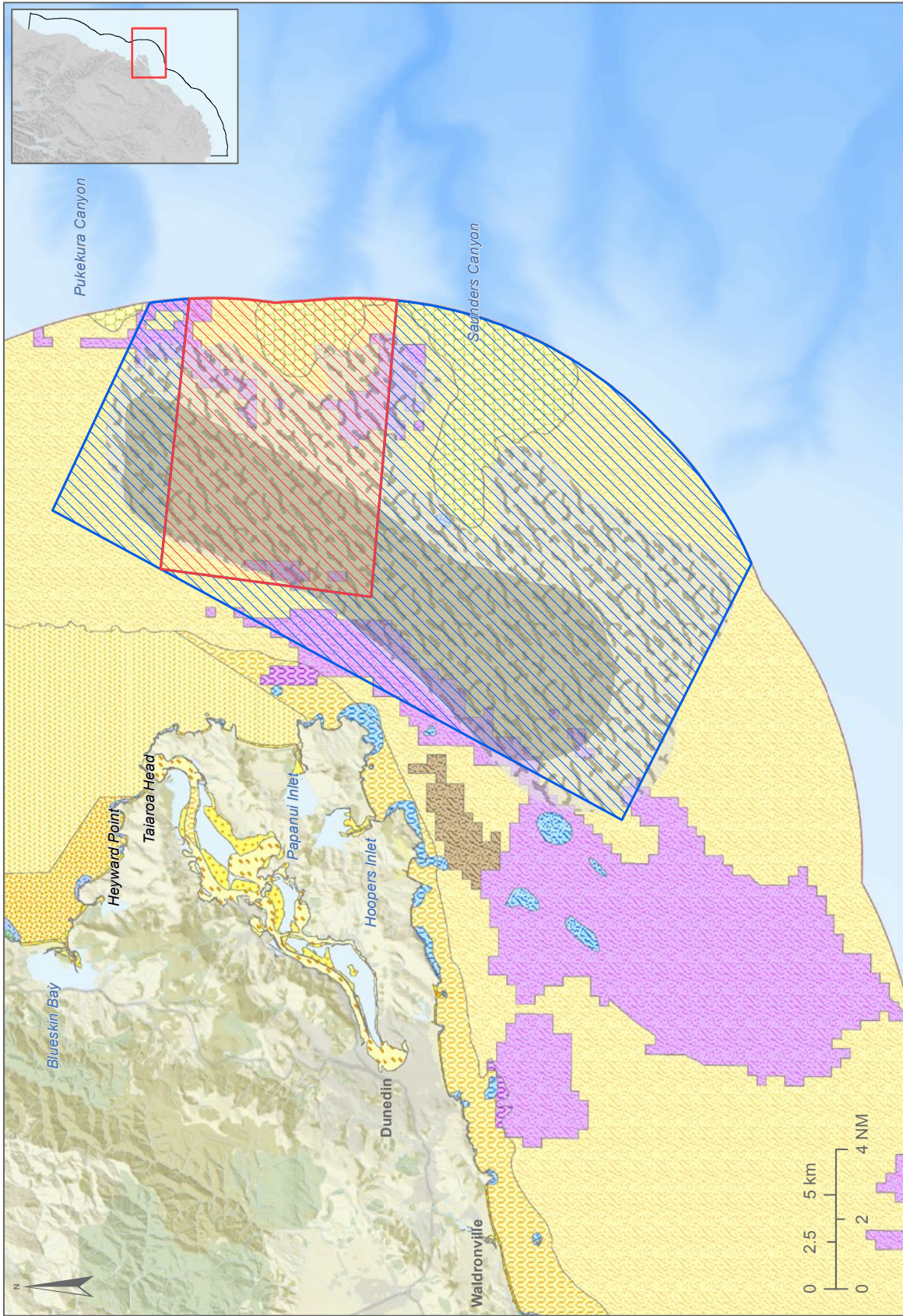
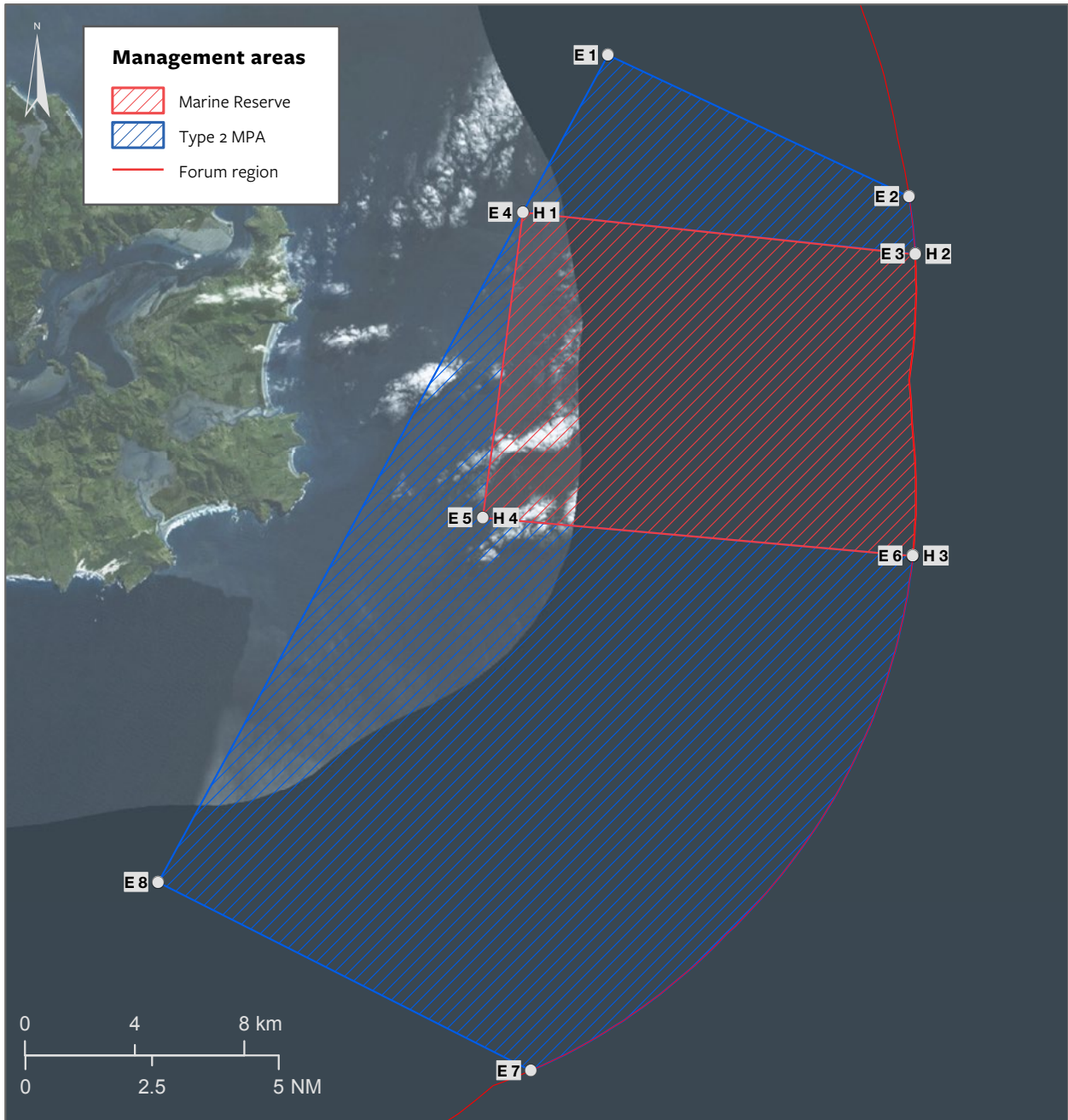


Figure 2-38: Broad-scale habitat map for E1 & H1

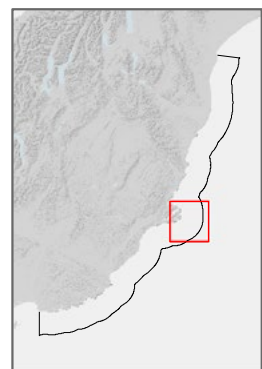
* For legend, see inside back cover.

Figure 2-39: Location map for E1 & H1



Index to Boundary Points		
Vertices	Latitude	Longitude
E 1	45° 43.870' S	170° 53.788' E
E 2	45° 46.809' S	171° 2.166' E
E 3	45° 47.946' S	171° 2.295' E
E 4	45° 46.921' S	170° 51.266' E
E 5	45° 52.928' S	170° 49.897' E
E 6	45° 53.898' S	171° 2.017' E
E 7	46° 3.856' S	170° 50.844' E
E 8	45° 59.938' S	170° 40.444' E
H 1	45° 46.921' S	170° 51.266' E
H 2	45° 47.948' S	171° 2.295' E
H 3	45° 53.898' S	171° 2.017' E
H 4	45° 52.928' S	170° 49.897' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
E1-E2	12150	6.561
E2-E3	2117	1.143
E4-E5	11267	6.084
E5-E6	15780	8.521
E6-E7	23419	12.645
E7-E8	15257	8.238
E1-E8	34412	18.581
H1-H2	14417	7.785
H2-H3	11112	6.000
H3-H4	15780	8.521
H1-H4	11267	6.084



2.4.7 Bryozoan Thickets & Papanui Canyon – Sites G2 (Type 2) & H2 (Marine Reserve)

2.4.7.1 OVERVIEW

Site G2 is only included in Network 2, whereas Site H is included in both networks but covers different sized areas (note: Site H1 is discussed in Section 2.4.6).

Sites G2 and H2 were proposed as a unit rather than as separate sites for consultation to enhance the protection of Papanui Canyon by establishing a Marine Reserve and the bryozoan habitat by establishing a Type 2 MPA (Figure 2-40).

Sites G2 and H2 were included in the Consultation Document as one of two alternatives to protect the canyons and bryozoan thickets in this region. Their boundaries have not been altered from the sites that were originally consulted on.

These sites include a Marine Reserve over the head of Papanui Canyon extending into the area where bryozoan habitat is most abundant (Site H2), and a Type 2 MPA covering the remaining area where bryozoan thicket is recorded as being most abundant. While the outer edge of the bryozoan thicket has not been confirmed, Site G2 spans the limits where it is recorded as “most abundant” to protect it. These two sites were proposed by the commercial sector as important areas for protection from trawling, dredging and Danish seining.

Site G2 overlaps with a current voluntary no-trawl area. The application of a Type 2 MPA to this area allows for regulatory protection from bottom-contact methods while still allowing methods such as set netting, long lining and potting, which have low impacts on the structure of the seafloor.

2.4.7.2 WHY THESE SITES HAVE BEEN RECOMMENDED

The biodiversity of the Otago Peninsula is strongly influenced by the Southland Current being ‘squeezed’ between the peninsula and the canyons, creating a diverse oceanographic environment. The Forum recognises the special biodiversity values associated with the continental shelf and canyons found off the Otago Peninsula.

Canyons

The Forum considers that the Saunders and Papanui canyons are unique features of the region and warrant protection.

The canyons extend some distance into deeper water with correspondingly different habitats, but the extent of the canyons beyond 12 NM is outside the Forum’s jurisdiction. Upokohue (long-finned pilot whales *Globicephala melas*), parāoa (sperm whales *Physeter macrocephalus*) and iheihe (shepherd beak whales *Tasmacetus shepherdi*) have been observed within the canyons.

Deep Reef and sponge beds have been reported in H2 by fishers trawling in the area.

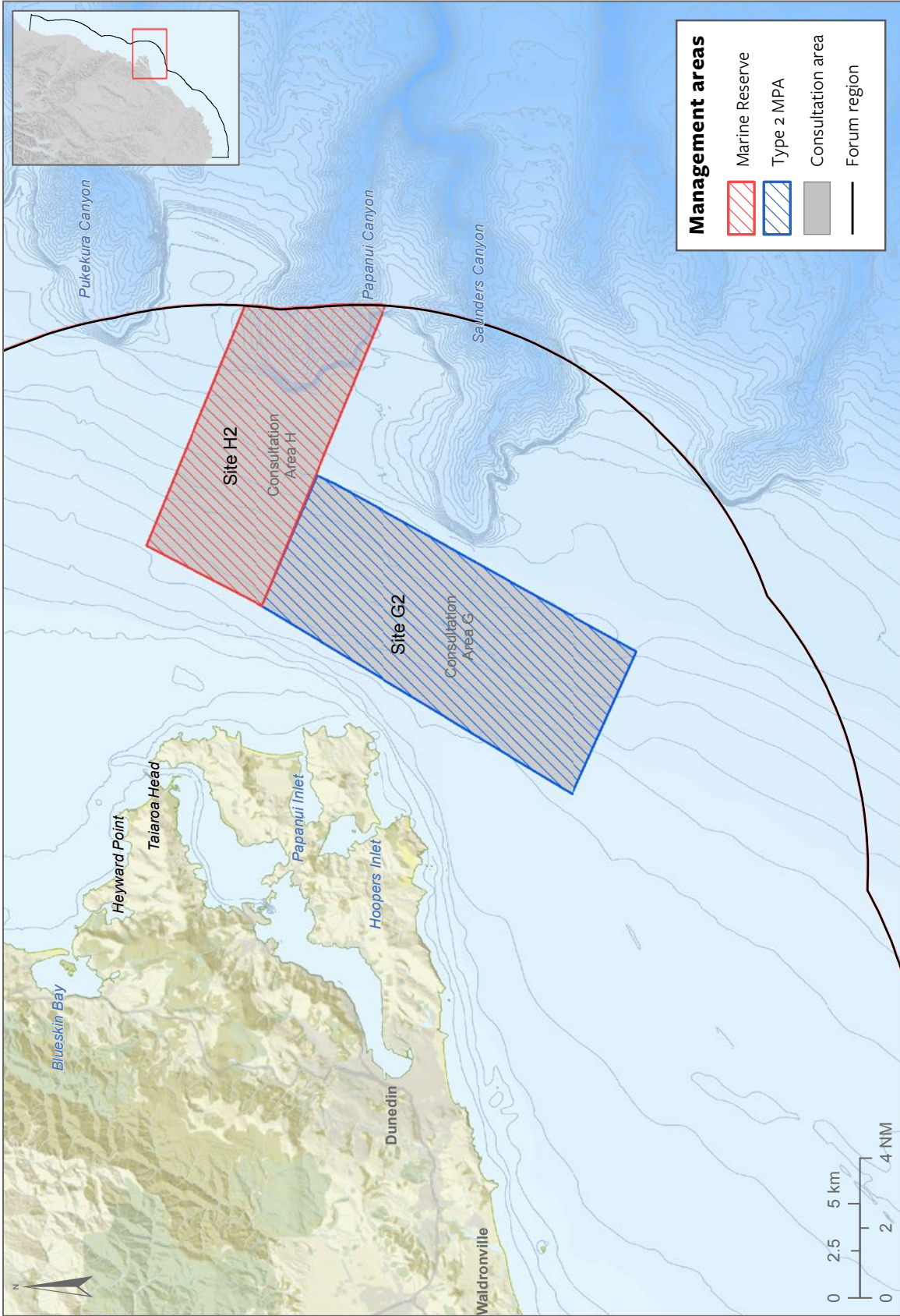


Figure 2-40: Network 2 Sites G2 & H2 overview map
Bryozoan thickets and Papanui Canyon

Bryozoans

All Forum members recognise the value of the bryozoan beds and agree that they should be protected in some way.

The bryozoan beds (shown in grey in Figure 2-41, page 168) represent a major biogenic habitat that has been identified off the Otago Peninsula. Biogenic habitats such as this create habitat for diverse invertebrate communities (e.g. sponges, anemones, worms, crabs, snails, sea stars, sea squirts and juvenile fish). It is considered that the bryozoan thickets off the Otago Peninsula meet the definition of ‘outstanding, rare, distinctive or internationally or nationally important marine habitats and ecosystems’ as mentioned in the MPA Policy.

The bryozoan species that create these beds tend to change with depth and sediment type across the continental shelf. Likewise, the many different invertebrate species that are associated with the bryozoan thickets also change as one moves from the shallower depths to deep water (i.e. there is longitudinal / cross-shelf variability).

The narrowing of the continental shelf off the Otago Peninsula and the abundance of organisms that use the bryozoans as habitat also create feeding grounds for some larger vertebrates such as rāpoka (New Zealand sea lions) and hoiho (yellow-eyed penguins), which target the waters over the bryozoans.

The bryozoan thickets support a commercially important set net fishery for mako (school shark). The catch intensity map for this fishery clearly shows the main areas where mako (school shark) are fished within the bioregion.¹⁵⁵ The area included in Site G2 supports a major portion of this fishery and so closing this area to set netting would displace 4.2% of this fishery within the region. MPI estimates the average annual export value of the mako (school shark) set net fishery within Site G2 at \$16,000 per year, based on an average annual volume of 3,115 kg.

Plateau

The plateau between the canyons is likely to be significantly influenced by the Southland Current and the upwelling is likely to occur from deeper waters up through the canyons.

Little is currently known about what lives in the plateau area. However, based on the upwelling and the knowledge that it is one of the few areas within the Forum region where tupa (scallops) occur, this is expected to be a very productive area and potentially an area of high biodiversity. This area previously supported a commercial fishery for tupa (queen scallops) and the industry is concerned that access is maintained to that important, likely seasonal fishery.

Rāpoka (New Zealand sea lions), kekeno (New Zealand fur seals) and a number of seabird species use the areas included within this proposal. Some 53 species of seabirds are known to forage here, including eight threatened species, three of which are classified as Nationally Critical. In addition, four species of toroa (albatross) have been assigned as being at very high risk of incidental catch in fisheries, while a further two are considered at high risk, and five species of shags and petrels are considered at medium risk.¹⁵⁶ The restrictions would protect important habitat for these species.

¹⁵⁵ This map contains potentially commercially sensitive information. It is not provided in the public version of this recommendations report, but is provided to the Ministers as supplementary information. See page 93 section 2.3.4.2.

¹⁵⁶ Richard, Y.; Abraham, E.R. 2015: Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006–2007 to 2012–2013. Ministry for Primary Industries, Wellington.
<http://fs.fish.govt.nz/Doc/23979/AEBR-162-risk-assessment.pdf.ashx>

The commercial sector are required to take MPI observers on their trawl and set net vessels as and when directed to do so. In addition, the industry has initiated the requirement that all inshore trawl vessels have seabird management plans and utilise mitigation methods. The proposed MPA will complement these industry initiatives at a regional level.

2.4.7.3 WHAT SUBMITTERS SAID

The majority of submitters opposed Sites G and H as contained in the Consultation Document. The supporters focused on the value of the two canyons as highly productive areas and the unique value of the bryozoan beds. Many submitters opposed Site H as they preferred the option of establishing a Marine Reserve over the larger Saunders Canyon. However, recreational and commercial submitters preferred a reserve over the smaller canyon as it will have less impact on their use.

Those supporting Site G referred to the importance of the bryozoan beds, and foraging areas for hoiho (yellow-eyed penguins) and rāpoka (New Zealand sea lions). Many of those opposing this site considered that the area did not represent the full range of habitats associated with the bryozoan beds and preferred the larger option proposed in Site E. In addition, a number of submitters were concerned about the risk of losing the mako (school shark) fishery if all of the bryozoan beds were closed, particularly from any proposal to ban set netting.

Several submitters expressed the opinion that the entire area that was consulted on in Sites E, F, G and H should be merged into one large Marine Reserve, and some also sought the reserve be linked to the shore.

In the Summary of Science Submissions, the central concerns around processes, species, valued habitats and usage for the proposed Sites G and H were similar to those for Site E (see Section 2.4.6), although the amount of opposition and number of proposed changes were greater, with particular concern that the sites are too small and do not represent the habitat diversity of alternative 1 (Sites E and F) in the Consultation Document.

Tables 2-22 and 2-23 show the positions of pro forma and individual submitters in relation to Sites G and H.

Table 2-22: Summary of submissions for Site G

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	736	1225	0
Individual	204	86	30
Total	940	1311	30

Table 2-23: Summary of submissions for Site H

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	737	1224	0
Individual	224	90	29
Total	961	1314	29

2.4.7.4 ANALYSIS OF NETWORK 2 SITES G2 & H2

Table 2–24: Site G2 & H2 analysis – Meeting the Policy requirements

Site G2 Bryozoan Thickets and Site H2 Papanui Canyon – Network 2	
Description	<p>Site G2:</p> <ul style="list-style-type: none"> • Site G2 starts approximately 2.7 km off the coast and has a width of approximately 8 km. Lengthwise, it extends 19 km along the plateau adjacent to the territorial sea limit. A total of 152 km² is included in this site. <p>Site H2:</p> <ul style="list-style-type: none"> • Site H2 adjoins Site G2 at the northern end, extending a further 7 km north and seaward out to the 12 NM territorial sea limit. A total of 106 km² is included in this site.
Relationship to Consultation Document	Both Sites G2 and H2 are the same as the original Sites G and H that were included in the Consultation Document.
Recommended management tool(s) ¹⁵⁷ / protection standard	<p>Site G2:</p> <ul style="list-style-type: none"> • A Type 2 MPA that includes restrictions on: <ul style="list-style-type: none"> ◦ Dredging ◦ Bottom trawling ◦ Danish seining ◦ Bottom disturbance and seismic testing associated with any activity. <p>Note that current fisheries restrictions within this site already include set netting to 4 NM offshore and Danish seining to 3 NM offshore, as well as a voluntary no-trawl area.</p> <p>Site H2:</p> <ul style="list-style-type: none"> • Marine Reserve. <p>Danish seining is already restricted out to 3 NM offshore at this site.</p>
Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data	<p>Site G2 includes two broad-scale habitat types that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Deep Gravel: 2.3% of this habitat type within the region. • Deep Sand: 2.7% of this habitat type within the region. <p>Site H2 includes three habitat types that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Deep Sand: 1.7% of this habitat type within the region. • Deep Water Sand: 25% of this habitat type within the region. This habitat type is specific to the canyons. This site is representative of this habitat type. • Deep Gravel: 0.5% of this habitat type within the region. <p>Together the two sites represent:</p> <ul style="list-style-type: none"> • 2.7% of Deep Gravel habitat • 4.4% of Deep Sand habitat • 25% of Deep Water Sand (canyon) habitat <p>Rare, unique and nationally/international significant habitats</p> <p>Site G2 includes 32% of the known Bryozoans habitat type, while Site H2 includes a further 17%. Therefore, together these sites protect 49% of the known extent of the distribution of habitat-forming bryozoans off the Otago peninsula.</p>

¹⁵⁷ For further details on existing management tools in the Forum region, see Section 2.3.

Site G2 Bryozoan Thickets and Site H2 Papanui Canyon – Network 2

Kāi Tahu cultural assessment¹⁵⁸

Poatiri (fish hook) is the Māori name for Mount Charles, which is appropriate given the rich traditional fishing grounds that are associated with the place it overlooks, Cape Saunders. Traditional settlements in the Cape Saunders area utilised sheltered anchorages to access the rich fishery in this region. The Crown has returned land at Cape Saunders to the hapū who were the original owners.

Maintaining and enhancing the marine ecosystems that contribute to the biodiversity of 'Te Tai o Araiteuru' is an important issue for Kāi Tahu. The fishery and associated ecosystems of the Cape Saunders area are of high importance to Kāi Tahu, local rūnaka, and their customary, commercial and recreational fishers.

Kaitiakitaka

The kaitiaki of the customary rights located in the coastal area covered by Sites G2 and H2 is undertaken by the whānau and hapū of Kāi Taoka, Kāti Moki and Kāi Te Pahi, and administered through Te Rūnaka o Ōtākou.

Customary fisheries

The shelf and canyons are similarly considered in terms of customary fisheries. The proximity of these significant canyons and nursery areas has traditionally ensured that the Cape Saunders area of the Otago Peninsula is one of the strongest and most coveted fisheries in the coastal area of Otago.

Traditions include disputes between Kāi Tahu and Kāti Māmoe over sea fishing boundaries, in retaliation to which the tohunga (priest) Putoki, from the northern tip of Cape Saunders, summoned a storm that dispersed the Pukekura fishing fleet of Kāi Tahu.

Significant villages were established on the northern and southern sides of Cape Saunders, and at Papanui Inlet for the purpose of accessing the very rich Cape Saunders fishery.

Whānau, hapū and fishers

The local rūnaka have established a mātaimai reserve in the outer Otago Harbour (2016). However, this does not define the extent of such interest nor reduce interest in an active management role within any reserve that is located in their rohe moana.

Ōtākou whānau and hapū have maintained a continuous and active role in all facets of fishery activity, be it customary, commercial or recreational.

Access to and use of the canyon fishery has been a fundamental aspect for Ōtākou commercial and recreational / customary fishers.

¹⁵⁸ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

Site G2 Bryozoan Thickets and Site H2 Papanui Canyon – Network 2

Adverse impacts on existing users

Commercial fishing¹⁵⁹

The combination of Sites G2 and H2 allows for commercial access to the traditional tupa (queen scallop) beds. Both sites protect bryozoan beds from bottom trawling, Danish seining and dredging, but allow access for set netting, longlining and potting, as these are important fisheries in this area.

Site G2:

- Contains an existing voluntary no-trawl area over the main area of the bryozoan thickets.
- Contains an important mako (school shark) fishery that uses low-physical-impact set netting.

Based on SeaSketch reporting, the top fisheries that will be displaced by Site G2 are:

- Trawl – tarakihi: 0.1%
- All other trawl fisheries: <0.1% each.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$2,600, based on a volume of 603 kg of fish.
- Of this, the main displacement could occur in the trawl fisheries for:
 - Pātiki (flatfish) – 140 kg, with an export value of \$980
 - Tarakihi – 140 kg, with an export value of \$720.
- Fourteen fishers trawl within Site G2, with an average total of 494 trawl events at this site per year.
- A total of 62 commercial fishers are thought to fish in this area or in the wider statistical area within which Site G2 is located.
- No fishers carry out Danish seining or dredging at Site G2.

Site H2:

Although Site H2 will have some impact on fishers, this will not be as great as if Saunders Canyon were made a Marine Reserve.

Based on SeaSketch reporting, the top three fisheries that will be displaced by Site H2 are:

- Jig – muheke (squid): 2.1%
- Line¹⁶⁰: 1.6%
- Pot – rawaru (blue cod): 1.4%.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$74,000, based on a volume of 12,969 kg of fish.
- Of this, the main displacement will occur in the:
 - Rawaru (blue cod) potting fishery – 1,900 kg, with an export value of \$31,900
 - Muheke (arrow squid) jig fishery – 5,400 kg, with an export value of \$16,700
 - Mako (rig) set net fishery – 900 kg, with an export value of \$5,500
 - Mako (school shark) set net fishery – 800 kg, with an export value of \$4,000
 - Rari (ling) potting fishery – 500 kg, with an export value of \$2,400.

¹⁵⁹ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁶⁰ Bottom longline and dahn line.

Site G2 Bryozoan Thickets and Site H2 Papanui Canyon – Network 2

Adverse impacts on existing users continued

Commercial fishing continued

- Forty-five fishers pot in this area, or in the statistical area within which Site H2 is located, with an average total of 494 potting events at this site per year.
- Three fishers jig in this area, or in the statistical area within which Site H2 is located, with an average total of 26 jigging events in this area per year.
- Four fishers set net in this area, with an average total of 138 set net events at this site per year.
- A total of 62 commercial fishers are thought to fish in this area or in the wider statistical area within which Site H2 is located, among whom:
 - Three fishers have catches of 1,000 kg or more that could be displaced, affecting between <0.1% and 1.8% of the individual fishers' catches within the relevant quota management areas.
 - These individual fishers could be:
 - 4,046 kg (<0.1% of the fisher's catch)
 - 2,544 kg (1.8% of the fisher's catch)
 - 1,352 kg (0.4% of the fisher's catch)
 - Fifty-five fishers would have 1% or less of their catch within the relevant quota management areas displaced.

Recreational fishing

Site G2:

- Allows for recreational fishing.
- The mandatory restriction of bottom-impacting methods could benefit recreational fisheries through the protection of the bryozoan nursery habitat.

Site H2:

- This site will have less impact on recreational fishers than a Marine Reserve over Saunders Canyon would have.
- Impacts will affect a subset of the recreational sports fishing community – the deep-water fishery that includes charter boat fishers.

Other impacts

Accessibility

- The public will rely on boats to experience either of these alternatives, including private craft, charter boats and tour vessels. Most trips will originate from Otago Harbour.
- Access for smaller craft (vessels of approximately 5 m plus) will be possible from a variety of locations.
- Access will be very weather dependent for recreational and small tourism vessels.

Benefits

- Dunedin's international reputation for nature tourism would be bolstered as the sea off the Otago Peninsula is a hotspot for threatened marine fauna.
- Benthic ecosystems on the shelf and bryozoan beds are of high value scientifically and have been the subject of research for more than 50 years. The accessibility of different water masses on the shelf is likely rare or unique in the world and provides huge opportunities for research on pelagic systems, pelagic benthic coupling, marine birds/mammals and climate change.

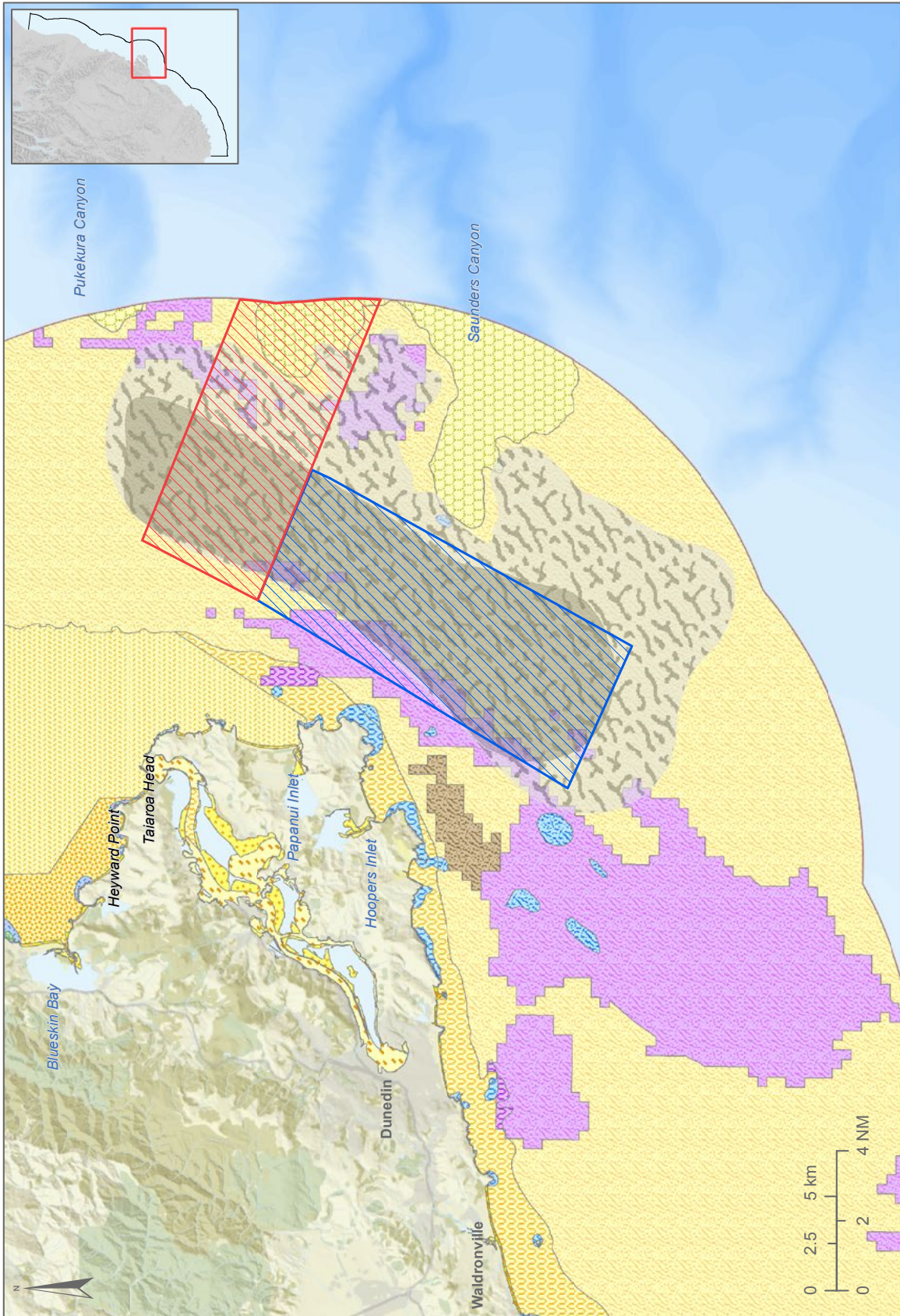
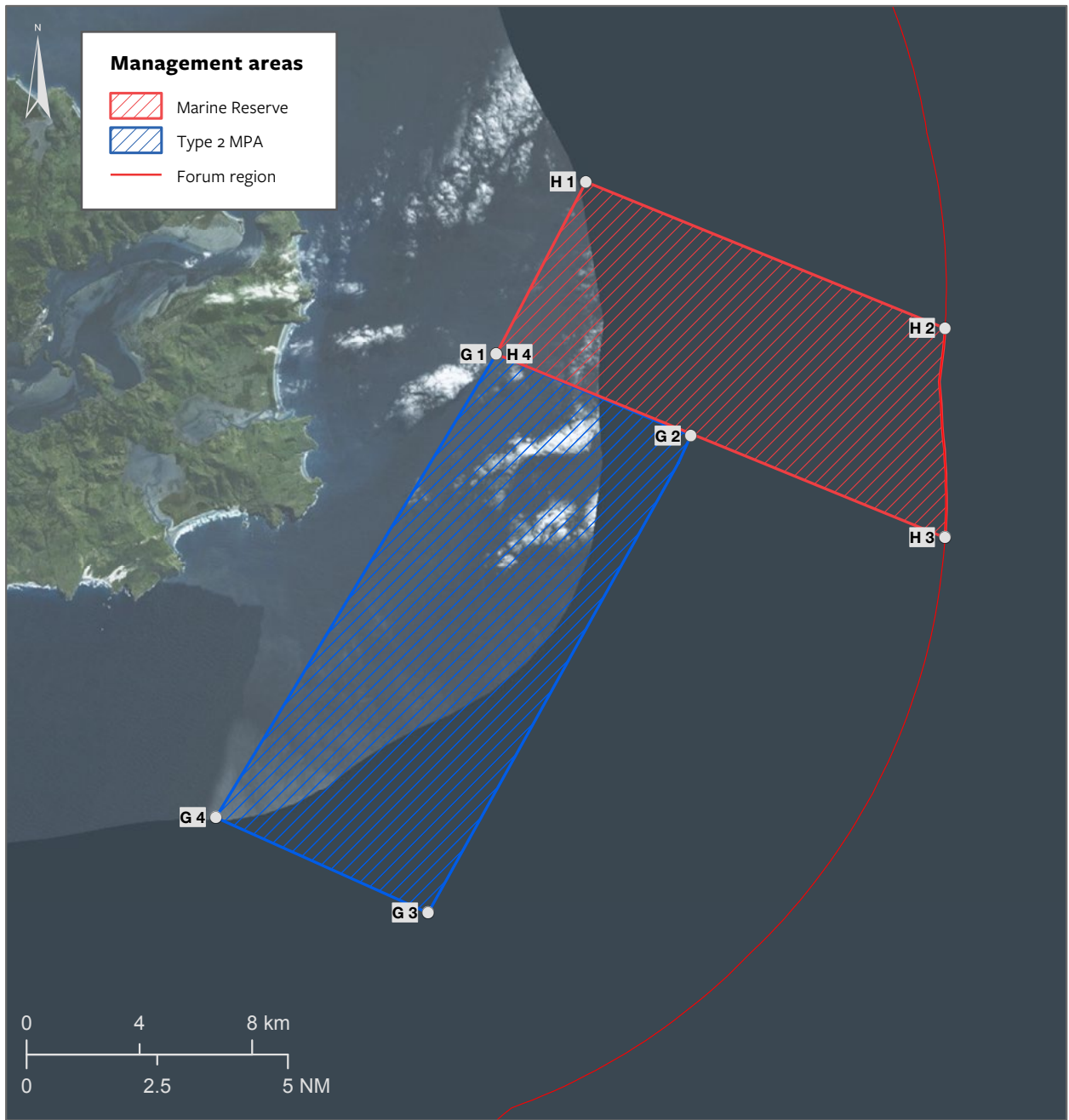


Figure 2-41: Broad-scale habitat map for G2 & H2

** For legend, see inside back cover.*

Figure 2-42: Location map for G2 & H2



Index to Boundary Points		
Vertices	Latitude	Longitude
G1	170° 49.913' E	45° 49.675' S
G2	170° 55.187' E	45° 51.340' S
G3	170° 47.618' E	46° 0.350' S
G4	170° 41.850' E	45° 58.403' S
H1	170° 52.493' E	45° 46.419' S
H2	171° 2.237' E	45° 49.399' S
H3	171° 2.095' E	45° 53.417' S
H4	170° 49.913' E	45° 49.675' S

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
G1 - G2	7491	4.045
G2 - G3	19349	10.447
G3 - G4	8275	4.468
G4 - G1	19239	10.388
H1 - H2	13778	7.440
H2 - H3	7465	4.031
H3 - H4	17221	9.299
H4 - H1	6896	3.724



2.4.8 Harakeke Point to White Island – Site I1 (Marine Reserve)

2.4.8.1 OVERVIEW

This site is only included in Network 1.

Site I1 extends from Harakeke Point at the northern limit to the breaking reef just west of Ponuahine (White Island).

An optional extension to Site I that incorporated Tow Rock was included in the Consultation Document but is not included in this recommendation (see Figure 2-43).

This site contributes to Network 1 by representing five habitat types.

2.4.8.2 WHY THIS SITE HAS BEEN RECOMMENDED

Site I1 provides protection for a significant area of the coast that includes a variety of habitat types. It is likely to be an iconic Marine Reserve with excellent access for the public. The site provides a balance between meeting the requirements of the MPA Policy in representing habitats in a Marine Reserve and minimising impacts to existing users.

The area has a high diversity of habitats in close proximity to each other, including both intertidal and subtidal rocky and soft-sediment habitats. Being on the doorstep of Dunedin, Network 1 proponents believe that this site could be a flagship Marine Reserve for the entire coast in terms of the number of people who are aware of it and may visit it.

This site is a highly productive area that tends to be more exposed to waves than Okaihae (Green Island), and therefore includes different habitats from those found there.

This area comprises cliffed coastal hills, medium to coarse grained sandy beaches, rocky outcrops, offshore stacks, Bird Island, Ponuahine (White Island) and a boulder-covered beach (Boulder Beach). It includes examples of basalt rock and is one of the few places with rock stacks in the Forum region. There are also caves under Gull Rock.

The water clarity around Tow Rock may be among the best in the region and, combined with the strong currents around Tow Rock, create an area of high biodiversity value. However, the Tow Rock area is also important for a range of recreational and commercial activities, and so has not been included in Site I1.

The rocky reefs are dominated by forests of rimurapa (bull kelp) *Durvillaea* spp. in the shallows and a diverse understorey of seaweeds below. A range of reef fishes such as moki, rawaru (blue cod), trumpeter and matahoe (butterfish), as well as kōura papatea (rock lobster) are found on reefs in this area. This area is unusual at a national scale due to the presence of a relatively intact pāua population, the existence of which is at least partly due to the prohibition of commercial pāua harvesting on this portion of coast for at least the last 30 years.

Rock pools also occur along the coast and around Bird Island in which pāua and other species might recover if given the chance. Therefore, this site represents an opportunity for a Marine Reserve.

There are a number of adjacent conservation areas, including those at Boulder Beach, Ōrau (Sandfly Bay), Tomahawk Lagoon and Ponuahine (White Island). This area is significant for seabirds, being especially noted for its hoiho (yellow-eyed penguin) population, and is also a rāpoka (New Zealand sea lion) haul-out area. Seals, kororā (little penguins), red-billed gulls (*Larus novaehollandiae scopulinus*), fairy prions (*Pachyptila turtur*) and terns (as well as various other seabirds) are commonly seen here, and kewa (southern right whales) pass through. A tītī (sooty shearwater *Ardenna grisea*) colony is also being restored nearby.

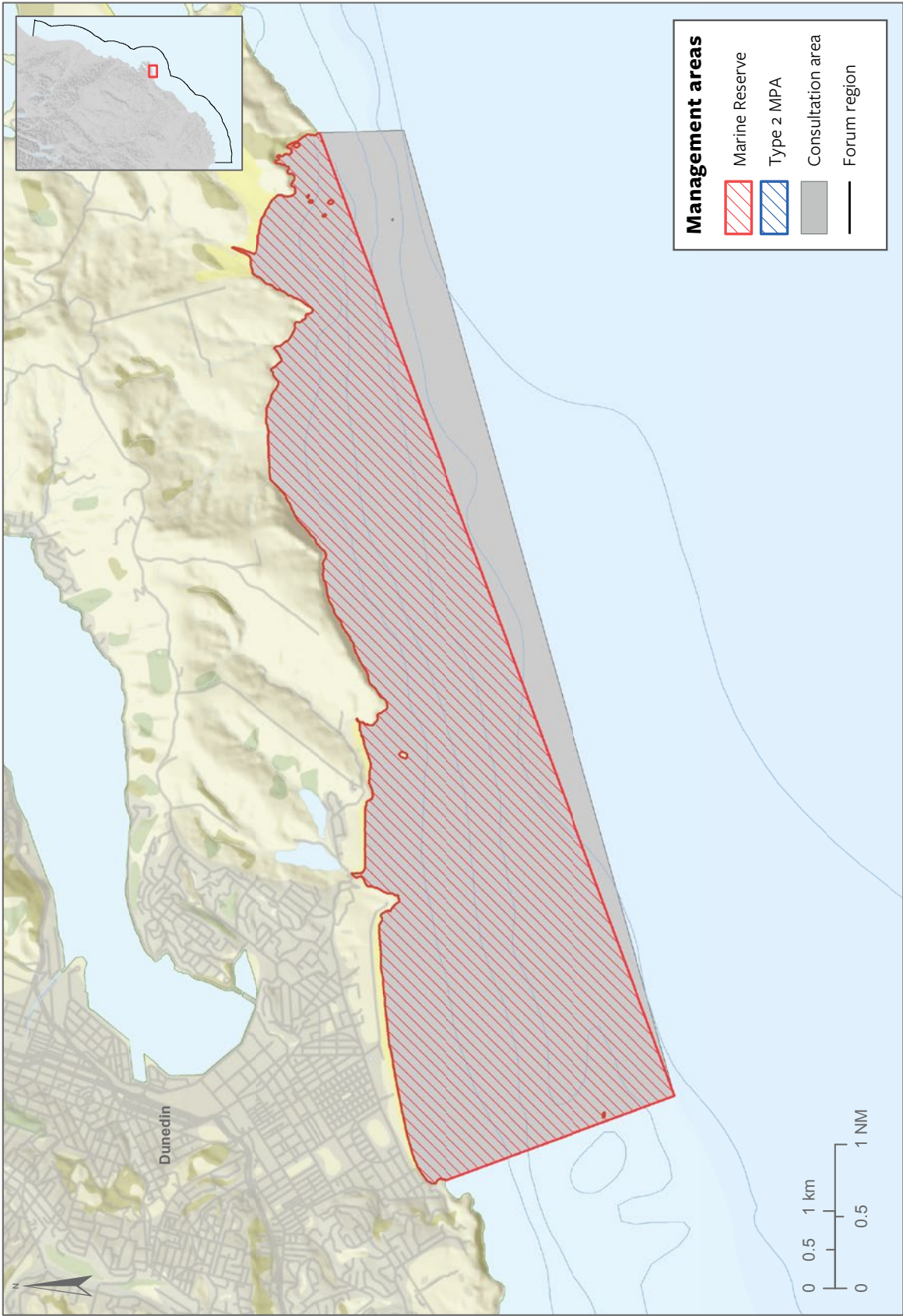


Figure 2-43: Site II – Harakeke Point to White Island

A few consented activities currently occur within this area that need to be considered, including sand extraction at Tomahawk Lagoon, and treated sewage discharge at Te Ika-a-paraheke (Lawyers Head) and offshore. However, none of these activities preclude a Marine Reserve being established and conditions can be written to allow them to continue.

The proponents of Network 1 considered including Tow Rock in this site, but have not done so because of its high significance for iwi, recreational and commercial interests. Excluding Tow Rock limits the ability to protect deeper rocky reef areas at this site.

2.4.8.3 WHAT SUBMITTERS SAID

Those in support recognised the recreational, economic, educational, research and biodiversity significance of having a Marine Reserve in close proximity to Dunedin that protects the foraging habitats of wildlife that the city is known for, particularly hoiho (yellow-eyed penguins), rāpoka (New Zealand sea lions) and seabirds. Submitters also commented on the value of having relatively intact pāua populations in high concentrations. The majority of submitters sought the inclusion of Tow Rock within the site and the extension of the site to 12 NM offshore to link it with the canyon reserve, creating a reserve that extended from the land to 12 NM offshore and included Hoopers Inlet.

Those in opposition cited the value of the area for fishing, including fishing competitions, implications for small boat safety, the lack of evidence for the value of excluding fishing and the argument that the area does not need to be protected because it is already protected by the weather. There were also various recommendations for exclusions, including making it a Type 2 MPA rather than a Marine Reserve and excluding Tow Rock.

Four submitters referenced the fact that this site had been fought for by the group Pāua to the People. This group originally formed to oppose the opening of this and other areas to commercial pāua fishing, wishing for them to be retained as recreational pāua fishing areas only.

The Summary of Science Submissions showed that the availability of public access (32 statements), especially to educators (31 statements), was highly valued. Several submitters commented on Sites I, J and K together noting the publicly accessible, no-take and recreational-only take combination could increase the educational and tourism economic value of the region achieve a vision of establishing a set of MPAs to distinguish the Dunedin area.¹⁶¹ Sixteen of the submissions explicitly considered commercial fishing interests against biodiversity and habitat values, 12 of which encouraged increased usage restrictions for public enjoyment and species protection, such as the Boulder Beach hoiho (yellow-eyed penguin) colony.

The option to extend or not extend this site to Tow Rock was specifically presented in the Consultation Document. Fifty-four statements from the science sector explicitly requested the extension and none opposed it. MPA planning literature was used to support the inclusion of Tow Rock as it is a significant habitat feature within the MPA area, although further enlargement (to maximise the habitat diversity value of the Tow Rock inclusion) was specifically requested by 16 submitters.

Table 2-25 shows the positions of pro forma and individual submitters in relation to Site I.

¹⁶¹ Site J is not being recommended for inclusion in the network.

Table 2-25: Summary of submissions for Site I

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1084	737	140
Individual	147	173	68
Total	1231	910	208

2.4.8.4 ANALYSIS OF SITE I1

Table 2-26: Site I1 analysis – Meeting the Policy requirements

Site I1 Harakeke Point to White Island – Network 1	
Description	The boundary of this site extends 17.8 km (9.6 NM) from Harakeke Point to a point approximately 1 km to the south of the breaking reef to the west of Ponuihine (White Island). Its coastal boundary is the headland near the St Clair Salt Water Pool. The site covers 28.8 km ² , which is 0.3% of the Forum region, and includes 2.3% of the Forum region's coastline.
Relationship to Consultation Document	This was one of two options included in the Consultation Document. The other option was to extend the site at its north-east corner to include Tow Rock. However, this is not included in this site recommendation.
Recommended management tool(s) ¹⁶² / protection standard	Marine Reserve
Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data	<p>Network 1 proponents consider that Site I1 includes five habitat types that contribute to the network's representativeness:</p> <ul style="list-style-type: none"> • Exposed Intertidal Reef: 6.2% of this habitat type within the region. Represents the Otago Peninsula extent of this broad-scale habitat type well. • Exposed Shallow Reef: 2.7% of this habitat type within the region. Represents the Otago Peninsula extent of this broad-scale habitat type well. • Exposed Sandy Beach: 9.0% of this habitat type within the region. This site likely represents the biodiversity of this broad-scale habitat type relatively well. • Exposed Shallow Sand: 3.1% of this habitat type within the region. This proposal likely represents the biodiversity of this broad-scale habitat type relatively well. • Exposed Boulder Beach: 80% of this habitat within the region. This is a very small habitat type regionally. <p>It also includes three habitat types that, while present, are unlikely to contribute significantly to the network's representativeness:</p> <ul style="list-style-type: none"> • Deep Gravel: 0.1% of this habitat type within the region. Will not represent the biodiversity associated with this broad-scale habitat type. • Deep Sand: 0.15% of this habitat type within the region. Will not represent the biodiversity associated with this broad-scale habitat type.

¹⁶² For more detail on existing management tools in the Forum region, see Section 2.3.

Site I1 Harakeke Point to White Island – Network 1

Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data continued

- Exposed Shallow Gravel: 3.5% of this habitat type within the region. This site includes small amounts of this habitat type around the perimeter, which are likely beyond the resolution of the habitat data. Therefore, there is low confidence around its contribution to representation.

It should be noted it is believed there is considerable variation within these habitat types and so this site only adequately represents the habitats associated with the Otago Peninsula, not those further south.

Kāi Tahu cultural assessment¹⁶³

The Sandymount and Ōrau (Sandfly Bay) area once supported a seasonal hunting village for which kaimoana and the local fishery were important sources of sustenance.

The coastal area is rich in traditional association. A nohoaka (temporary campsite) was located in the sands of Ōrau (Sandfly Bay), with traditional trails linking to the northern Peninsula, and south to Taieri River mouth and thence inland to the wetlands of the Taieri Plains.

In addition, settlements or nohoaka were located at Tomohaka (Tomahawk) and the southern end of Rakiatea (St Clair Beach). Nohoaka were also used by travellers via the Otago Harbour, who hauled their waka ashore near Puketahi (Sunshine) in the Andersons Bay Inlet area and would break their journey north or south in the vicinity of the Tahuna Park.

The fishery and kaimoana that were available in this coastal area represented an important traditional resource. There remains a high customary fisheries interest along this coastal area from Harakeke Point south toward Māori Head, which includes diving and kaimoana gathering. Although this is limited in some instances due to an offshore sewage discharge south of Te Ika-a-paraheke (Lawyers Head), it is otherwise a 'reliable' kaimoana source located close to Dunedin City.

No Māori Reserve lands are located adjacent to Site I1 but the hunting village located at Ōrau (Sandfly Bay) was the scene of a significant archaeological excavation in the last decade.

Kaitiakitaka

The kaitiaki of the customary rights located in the coastal area covered by Site I1 is undertaken by the whānau and hapū of Ōtākou, and administered by Te Rūnaka o Ōtākou.

Access to Site I1 from the landward side is variable, with private land and DOC-administered land predominating, as well as significant physical obstacles such as steep cliffs. Te Rūnaka o Ōtākou do not oppose Site I1 on the basis that the impacts on customary and commercial are manageable.

In principle, Te Rūnanga o Ngāi Tahu support Site I1.

Adverse impacts on existing users

Commercial fishing¹⁶⁴

- This area may occasionally be used by papaka (paddle crab) fishers who will be impacted by this proposal. Other papaka (paddle crab) areas may have been lost to the mātaihai reserve at Karitane, which will limit the places to which effort here can be displaced.
- The larger potential impacts on commercial fishers have been avoided by the exclusion of Tow Rock from Site I1.
- Traditionally, there is little commercial fishing in the Ponuihine (White Island) area.
- Commercial pāua harvesting is currently prohibited within the boundaries of this site, except for around Ponuihine (White Island).

¹⁶³ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

¹⁶⁴ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

Site I1 Harakeke Point to White Island – Network 1

Adverse impacts on existing users continued

Based on SeaSketch reporting, the top three fisheries that will be displaced by Site I1 are:

- Pot – kōura papatea (rock lobster): 1.8%
- Line¹⁶⁵: 0.5%
- Pot – rawaru (blue cod): 0.5%.

Muheke (squid) jigging is also reported at 0.5% displacement, but it is thought to be unlikely that there would be any jigging within this site.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$189,000, based on a volume of 4,288 kg of fish.
- Of this, the main displacement would occur in the potting fisheries for:
 - Kōura papatea (rock lobster) – 1,400 kg, with an export value of \$168,000
 - Rawaru (blue cod) – 700 kg, with an export value of \$11,600.
- Fifty-five fishers pot in this area, or in the statistical area within which Site I1 is located, with an average total of 767 potting events in this area per year.
- A total of 73 commercial fishers are thought to fish in this area or in the wider statistical area within which Site I1 is located, among whom:
 - Four fishers have catches of 400 kg or more that could be displaced, affecting between <0.1% and 0.4% of the individual fishers' catches within the relevant quota management areas.
 - The individual fishers with the top three maximum displacements of catch by volume could be:
 - 794 kg (<0.1% of the fisher's catch)
 - 550 kg (0.4% of the fisher's catch)
 - 448 kg (0.1% of the fisher's catch).
 - Sixty-nine fishers would have 1% or less of their catch within the relevant quota management areas displaced.

Recreational fishing

- This area has been historically important for recreational pāua fishing to the extent that a commercial application to open it was opposed.
- Site I1 would have some impact on spearfishing, shore-based fishing and shellfish gathering, and would affect accessibility to recreational fishing – not every recreational fisher has a boat and the areas that are most accessible for land-based fishing need to be maintained.
- Significant membership of a number of recreational fishing clubs have opposed this site based on accessibility and exclusion from this area pushing them into other areas where safety risks can be an issue.
- Two of the most popular fishing areas to Dunedin have been excluded from this site – the reefs to the west of Ponuahine (White Island) and Tow Rock.

¹⁶⁵ Bottom longline and dahn line.

Site I1 Harakeke Point to White Island – Network 1

Other impacts

Accessibility

For management:

- The landward edge of Site I1 encompasses St Clair and St Kilda Beaches, Tomohaka (Tomahawk), Smaills and Boulder Beaches, and Ōrau (Sandfly Bay) – the most accessible frontage for any of the Forum proposals.
- The seaward western edge of the site at Ponuahine (White Island) is 3.1 km from land.
- Management activities would be conducted from land or sea, with land access being readily available at the numerous beaches.

For enforcement:

- The nearest port is Port Chalmers / Careys Bay. However, Wellers Rock, which is closer to the Otago Harbour entrance, is a closer option for trailered small craft.
- The relatively narrow seaward extent of Site I1 without Tow Rock would assist enforcement activities.

For the public:

- The soft and hard shores, including rock pools, at Te Ika-a-paraheke (Lawyers Head), Tomohaka (Tomahawk Beach) and Smaills Beach are highly accessible. Ōrau (Sandfly Bay) requires more effort to access but is a haven for rāpoka (New Zealand sea lions) and hoiho (yellow-eyed penguins), and is popular with tourists.

Aside from the Highcliff section, access is good along most of the site, from Ocean Grove right around to Ōrau (Sandfly Bay). Access is convenient by road and walkway. Tomohaka (Tomahawk Beach) and Otago Harbour are the key entry points by boat.

Benefits

- Potential benefits from the spillover of larved and spawning aggregations (primarily pāua, rawaru (blue cod), matahoe (butterfish) and blue moki).
- Good diving and snorkelling.
- Dunedin's nature tourism profile and economic performance may be boosted by the presence of a Marine Reserve along 18 km of the city's shoreline.
- A Marine Reserve here would enhance the city's natural environment and amenities.
- Direct tourism benefits for visiting, snorkelling and diving, and the site also provides the opportunity for marine education and interpretation.
- Indirect benefits for Otago's tourism image and through scientific research into iconic tourism species.
- Ōrau (Sandfly Bay) is already a high-use tourism site for viewing hoiho (yellow-eyed penguins) and rāpoka (New Zealand sea lions), and a Marine Reserve could complement this.
- Wave-exposed rocky and soft-sediment habitats are accessible for scientific study (in good conditions, this area is easily accessible from the shore and is less than 1 hour by boat from the University of Otago's Portobello Marine Laboratory). In particular:
 - This area provides a good example of a wave-exposed shoreline. The response of shallow subtidal and intertidal habitats to the removal of fishing will provide interesting topics for scientific study.
 - A relatively intact pāua population could provide a control/reference site for the southern coast.
 - The area provides opportunities to establish protected habitat types and populations of a range of exploited species, and will provide a greater understanding of marine ecosystems that could inform fisheries management.

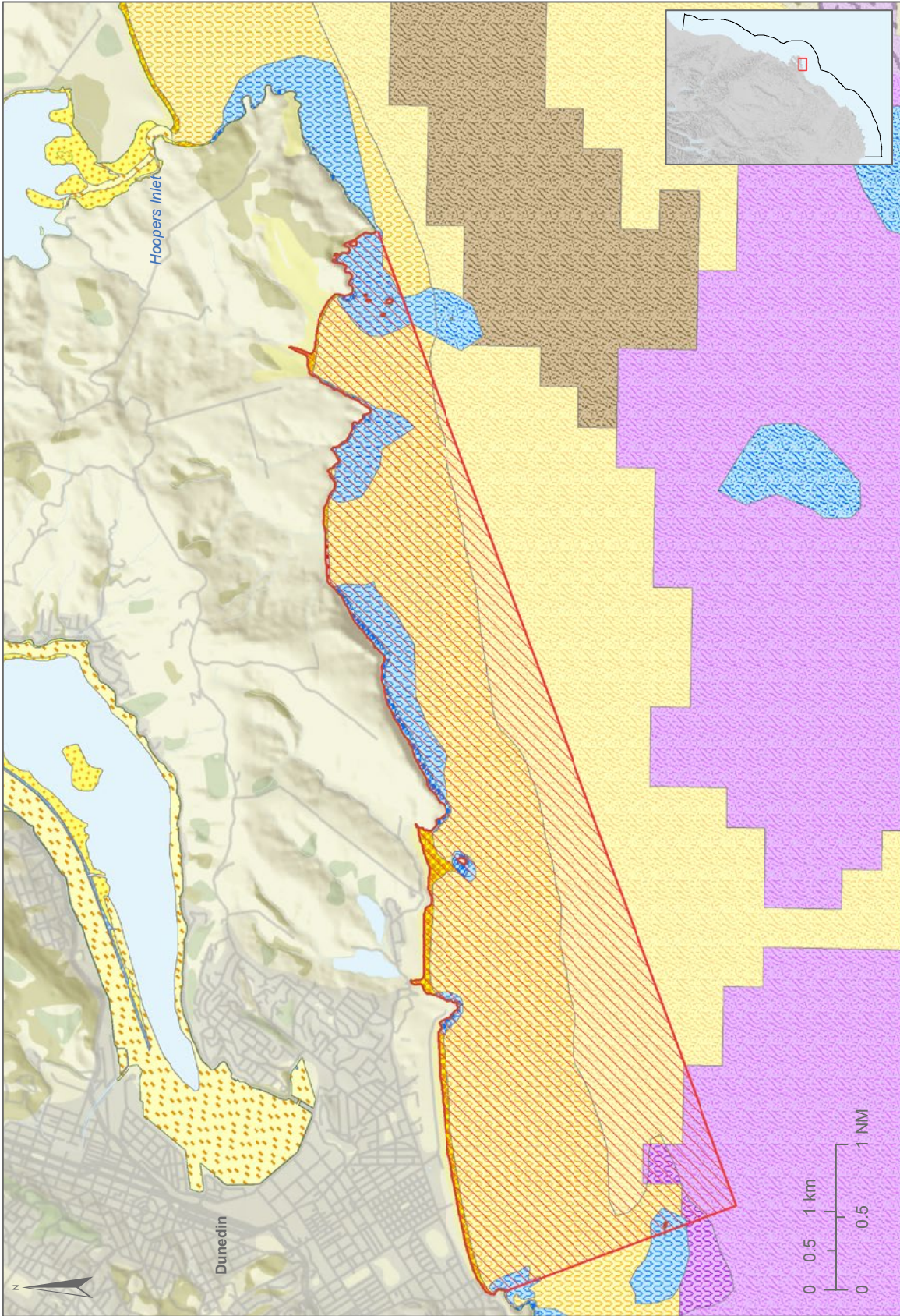
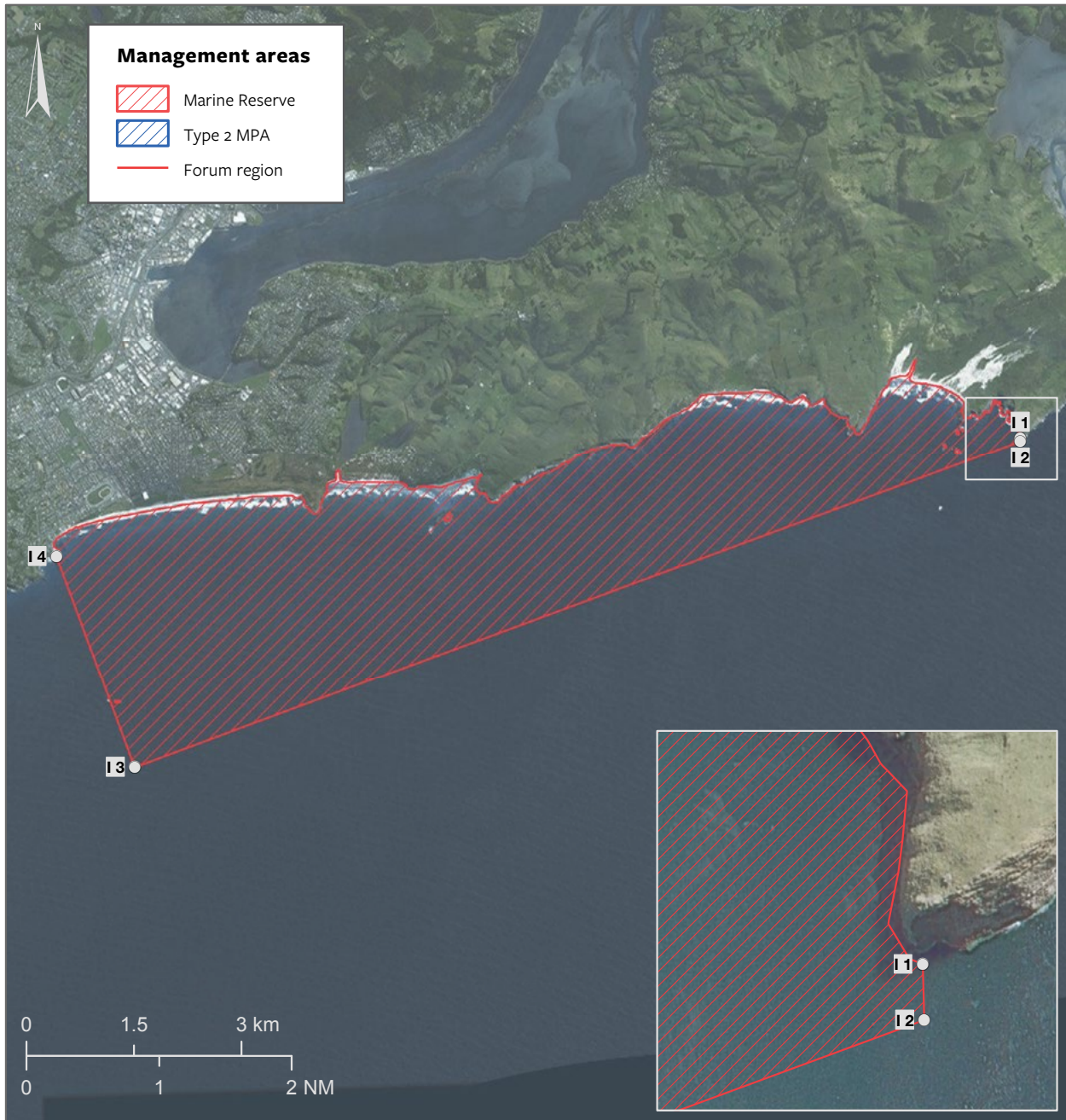


Figure 2-44: Broad-scale habitat map for Site I1 – Harakeke Point to White Island

** For legend, see inside back cover.*

Figure 2-45: Location map for Site I1 – Harakeke Point to White Island



Index to Boundary Points		
Vertices	Latitude	Longitude
I 1	45° 54.225' S	170° 39.763' E
I 2	45° 54.249' S	170° 39.763' E
I 3	45° 56.503' S	170° 30.081' E
I 4	45° 54.895' S	170° 29.307' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
I1-I2	43	0.023
I2-I3	13197	7.126
I3-I4	3141	1.696



2.4.9 Okaihae (Green Island) – Site K1 (Marine Reserve)

2.4.9.1 OVERVIEW

This site is only included in Network 1.

This site is the same as Site K in the Consultation Document.

This proposed Marine Reserve encompasses Okaihae (Green Island), extending approximately 1 km to the north, west and east of the island, and 1.3 km to the south (Figure 2-46). It includes 5 km² of marine area and encompasses approximately 0.1% of the Forum region.

2.4.9.2 WHY THIS SITE HAS BEEN RECOMMENDED

Green Island Nature Reserve is important ecologically, and historically supported a diverse array of marine life (and still does to a lesser extent).

Anecdotally, the Okaihae (Green Island) marine environment has undergone a considerable decline in the diversity and abundance of species over the last few decades. Therefore, it is considered that the area could respond well to protection.

The Marine Reserve would be accessible by boat and is visible from southern parts of Dunedin. Okaihae (Green Island) could become an iconic place, with the existing nature reserve extending through to the marine environment as a Marine Reserve.

Okaihae (Green Island) is a very different habitat from Ponuihine (White Island) and would represent a biodiversity that is not represented elsewhere. It is unique and outstanding, and the best example of an offshore island in the Forum region.

Okaihae (Green Island) is also an important wildlife area. This protected nature reserve (meaning a permit is required to land there) is one of the few predator-free vegetated offshore islands in the south-east region. The island is home to a number of seabird species, such as tītī (sooty shearwater), kororā (little penguins), red-billed gull, fairy prion, hoiho (yellow-eyed penguin), little cormorant (*Microcarbo niger*) and koau (Otago shag), and supports a large spoonbill population. It is also frequently visited by seals, rāpoka (New Zealand sea lions) and mako taniwha (great white sharks).

In the inshore region, the reef drops to approximately 18 m and is semi-sheltered, whereas further out it extends deeper to approximately 40+ m and is more exposed.

The rocky reefs include forests of rimurapa (bull kelp) *Durvillaea* spp. in the shallows with an understorey of seaweed species below. They provide habitat for many reef fish species, such as moki, kohikohi (trumpeter) and matahoe (butterfish), as well as kōura papatea (rock lobster). Anecdotally, hāpuku (groper) were also commonly found on the Okaihae (Green Island) reefs, but these are now encountered less often.

2.4.9.3 WHAT SUBMITTERS SAID

The majority of submissions supported Site K.

Those in support agreed with the area's biodiversity values, and also valued it as a dive spot and recognised its potential for tourism and research. Many individual submitters suggested that the area should be extended in various ways: to the shore, with a link to Kaikorai Estuary, to the south-west to include deep-reef habitat and offshore to 5 NM.

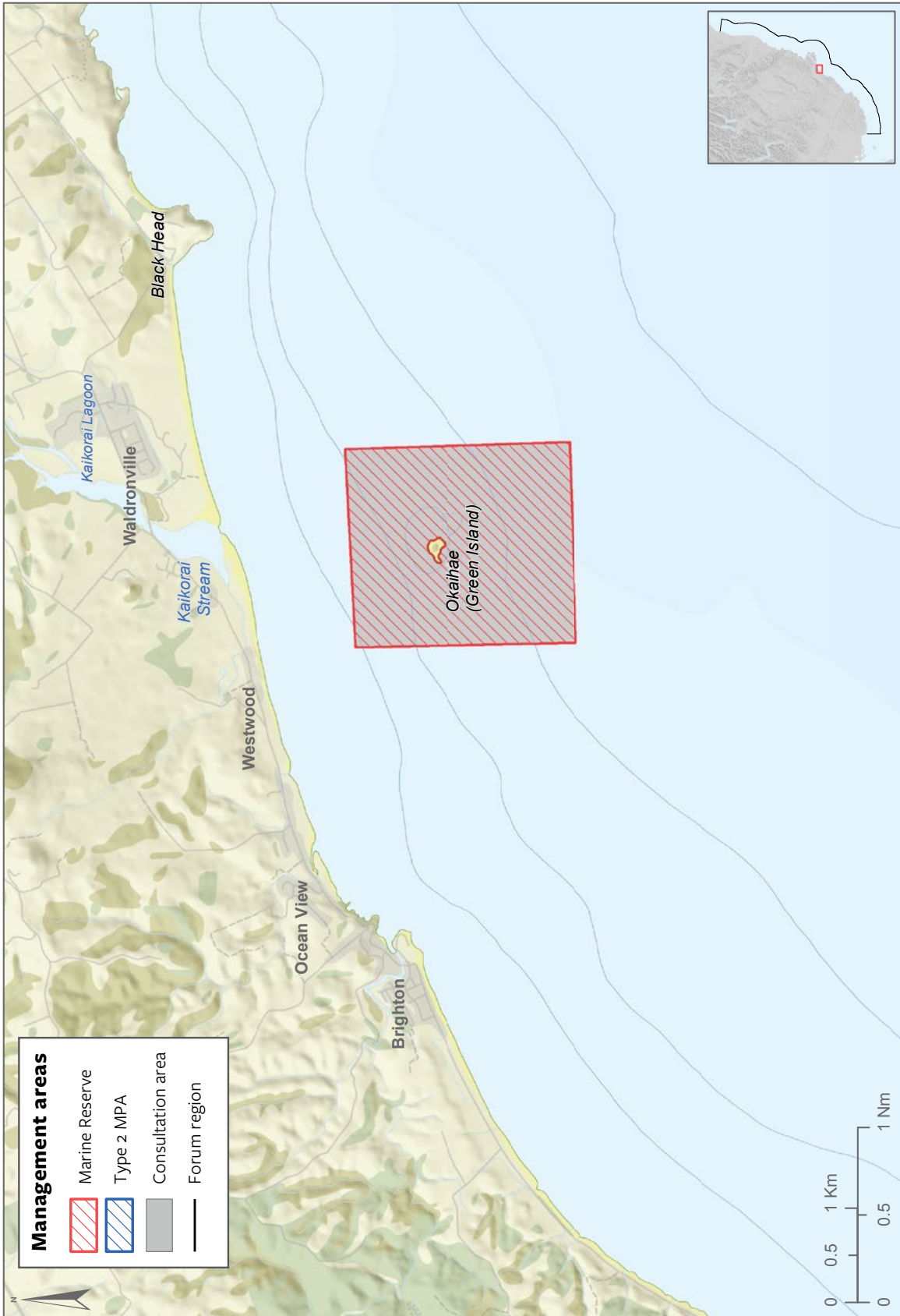


Figure 2-46: Site K1 - Okaihae (Green Island) overview map

Those in opposition cited its importance as a safe recreational fishing and diving area, and queried the value of protection given its supposed decline in biodiversity values.

In the Summary of Science Submissions, a total of 24 submitters requested enlarging the MPA and used Site K as an example of the Forum not proposing enough area of unfragmented coastal habitat to provide viable, ecologically functional units to at least meet the 10% governmental mandate. Fifteen submitters requested an alongshore extension, mostly westward, and 14 expressly indicated the desire for an extension to the adjacent shoreline to avoid complex boundaries and to include the Kaikorai Estuary to maintain coastal population connectivity. Significant edge effects resulting in reduced protection and network value were also a concern.

Table 2-27 shows the positions of pro forma and individual submitters in relation to Site K.

Table 2-27: Summary of submissions for Site K

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1223	737	0
Individual	162	136	32
Total	1385	873	32

2.4.9.4 ANALYSIS OF SITE K1

Table 2–28: Site K1 analysis – Meeting the Policy requirements

	Site K1 Okaihae (Green Island) – Network 1
Description	Extends 800 m to 1300 m around Okaihae (Green Island). The inshore boundary is 1–1.5 km from the coastline and the site encompasses approximately 5 km ² .
Relationship to Consultation Document	Consistent with Site K in the Consultation Document.
Recommended management tool(s)/ protection standard	Marine Reserve.
Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data	<p>Network 1 proponents consider that Site K1 includes three habitat types that contribute in some way to the network’s representativeness:</p> <ul style="list-style-type: none"> Exposed Intertidal Reef: 0.37% of this habitat type within the region. Unlikely to represent this habitat type across the region due to the small area included, but may contribute to representation from other sites. Exposed Shallow Reef: 0.22% of this habitat type within the region. Unlikely to represent this habitat type across the region due to the small area included. However, Okaihae (Green Island) is ecologically distinct and therefore will likely contribute to overall representation in conjunction with other sites. If the boundary of the proposal entirely encompasses the reef area, rather than bisects it, the size may be sufficient to be viable. If the reef is bisected, its viability is likely to be compromised. Future monitoring is recommended to ascertain the exact extent of the reef, for consideration at the 25-year generational review or earlier. Exposed Shallow Sand: 0.58% of this habitat type within the region. Will not represent this habitat type, but may contribute to representation from other sites, particularly Site I1. <p>It also includes one habitat type that, while present, will not contribute significantly to the network’s representativeness:</p> <ul style="list-style-type: none"> Deep Sand: 0.03% of this habitat type within the region. Will not contribute to representation for this habitat type.
Kāi Tahu cultural assessment ¹⁶⁶	<p>Okaihae (Green Island) was included in the sale of the Ōtākou Block 1844 and so is not Māori land. While Okaihae (Green Island) was accessed traditionally for manu (birding), this would have been a seasonal and weather dependent practice.</p> <p>Customary fisheries</p> <p>The relative proximity of Okaihae (Green Island) to traditional settlements located at the mouths of the Kaikarae (Kaikorai Stream) and Otokia Creek (Brighton), and at Rakiatea (St Clair Beach) ensured that it was part of the mahika kai network.</p> <p>Okaihae (Green Island) traditionally supported customary fishing and birding activity.</p> <p>Kaitiakitaka</p> <p>The kaitiaki of the customary rights located at Site K1 are undertaken by whānau and hapū of Kāi Taoka, Kāti Moki and Kāi Te Pahi, and administered through Te Rūnaka o Ōtākou.</p>

¹⁶⁶ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

Site K1 Okaihae (Green Island) – Network 1

Kāi Tahu cultural assessment continued

Whānau, hapū and fishers

A mātaimai reserve was proposed by a Whānau Roopu for the Brighton coast a number of years ago. However, the proposal received significant opposition and was not progressed. Ōtākou whānau and hapū have maintained a continuous and active role in all facets of fishery activity, including customary, commercial and recreational, within their rohe moana.

Customary use, mātauraka, manaakitaka and commercial fishers

Kāi Tahu commercial fishers oppose Site K1 due to the impact the proposal has on that part of their commercial fishing grounds.

Te Rūnaka o Ōtākou do not oppose Site K1 due to the manageable impact on the customary commercial fishery.

In principle, Te Rūnanga o Ngāi Tahu support Site K1.

Adverse impacts

Commercial fishing¹⁶⁷

- This area is used for rawaru (blue cod) and kōura papatea (rock lobster) potting. Centre Reef is an important area, particularly for kōura papatea (rock lobster), and so has been excluded from the proposal to reduce impacts.
- There is a marginal amount of bottom trawling close to the island.
- Boats quite often anchor on the inside of the island for shelter. This activity would not be prevented within the Marine Reserve as long as fishing gear was stored.
- Based on available information, it is unlikely that the reserve will have any significant impact on commercial fishers. However, due to the spatial scale over which kōura papatea (rock lobster) is reported, the Forum could not ascertain with much confidence the exact scale of impact on this high-value stock.

Based on SeaSketch reporting, the top two fisheries that will be displaced by Site K1 are:

- Pot – kōura papatea (rock lobster): 0.2%
- Pot – rawaru (blue cod): 0.1%.
- Line¹⁶⁸ and all trawl fisheries are each displaced by <0.1%.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$17,600, based on a volume of 423 kg of fish.
- Of this, the main displacement could occur in the potting fisheries for:
 - Kōura papatea (rock lobster) – 126 kg, with an export value of \$14,800
 - Rawaru (blue cod) – 118 kg, with an export value of \$2,000.
- Fifty-five fishers pot within this area or in the statistical area within which Site K1 is located.
- A total of 61 commercial fishers are thought to fish in this area or in the wider statistical area within which Site K1 is located, among whom:
 - No fishers have catches of more than 30 kg that could be displaced
 - All of the fishers would have 0.4% or less of their catch within the relevant quota management areas displaced.

¹⁶⁷ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁶⁸ Bottom longline and dahn line.

Site K1 Okaihae (Green Island) – Network 1

Recreational fishing

- This is an accessible fishing area from Brighton and so Site K1 will affect recreational fishers, particularly as the island provides shelter from prevailing sea conditions. It is relatively close to shore for fishers to return to the beach should the weather become a safety risk. It may also impact on the Brighton Fishing Competition, which benefits the whole community.
- Public feedback suggests that most of the recreational fishing probably occurs to the west of the island. The relatively small size of the reserve is intended to ensure that recreational fishing can still occur in the general vicinity.
- Okaihae (Green Island) is a spearfishing area. Spearfishing occurs around the island and will be impacted by this proposal. A clear finding could not be made on where most other recreational fishing occurs.
- There will be potential benefits from the spillover of larvae and from spawning aggregations.
- Site K1 will potentially have a high impact on recreational fishing. It is important to note that there is uncertainty about the actual impacts (positive or negative) of displacing these recreational fishers. The information received through consultation and submissions was conflicting on the extent to which the proposed area was used for recreational fishing.
- Safe recreational diving and snorkelling area.

Other impacts

Accessibility

- This offshore site is accessible by small craft launching from Brighton Beach or St Clair Beach (note: there is no jetty at Okaihae (Green Island)).
- Visible from parts of Dunedin, Okaihae (Green Island) is a tempting destination but, being a nature reserve, visits are generally restricted for the purposes of management and scientific research.
- A permit is required to land on Okaihae (Green Island).

Benefits

- Good for education but access by boat only limits the age groups that can visit.
- Potential tourism benefits for boat visiting, diving and snorkelling in a diverse area. This area has particularly strong support for its tourism benefits.
- A Marine Reserve designation would complement the nature reserve status of Okaihae (Green Island) and add to the natural heritage reputation of Dunedin City ('Wildlife Capital of New Zealand').
- Marine science research opportunities for studying offshore island ecology.

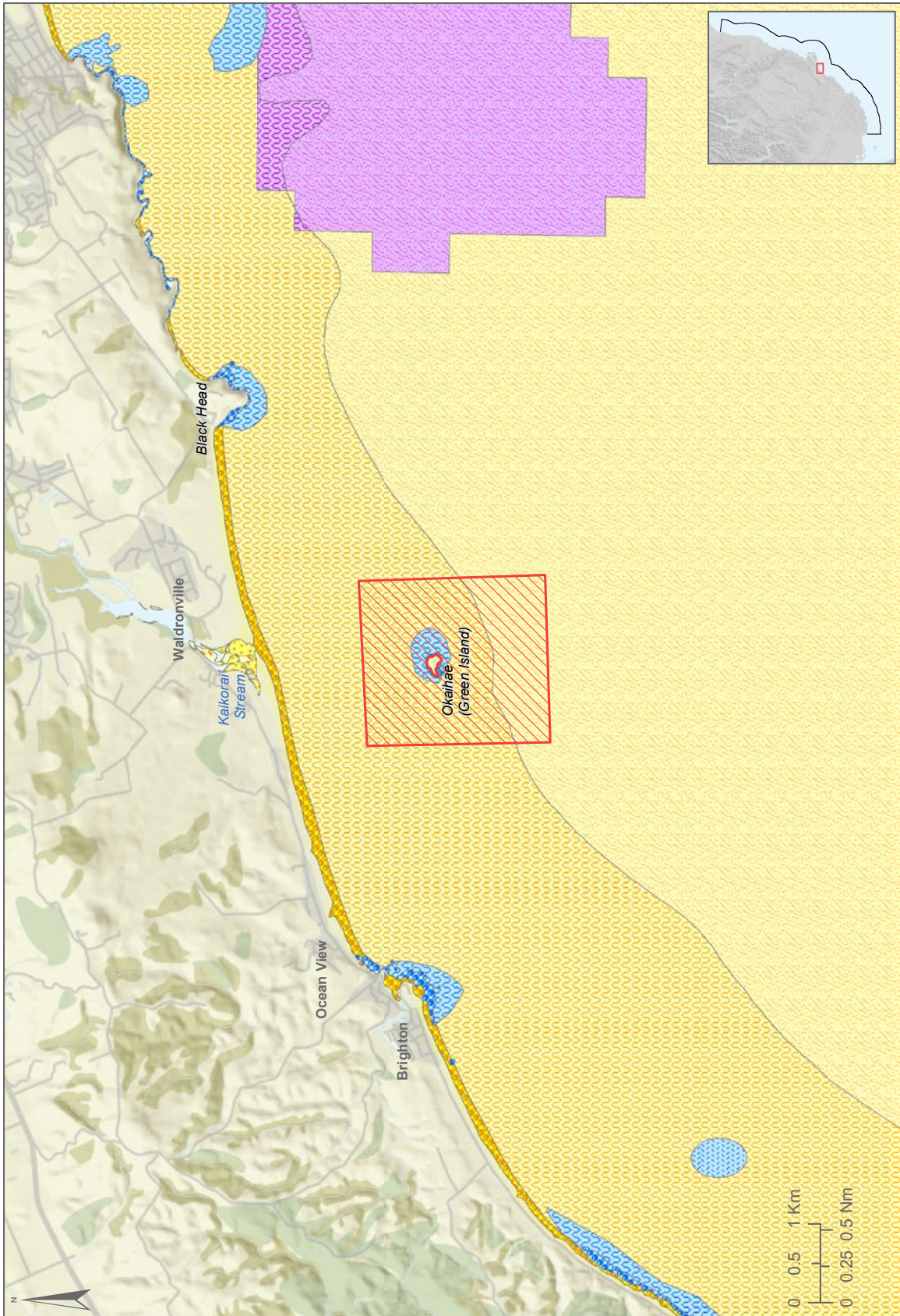
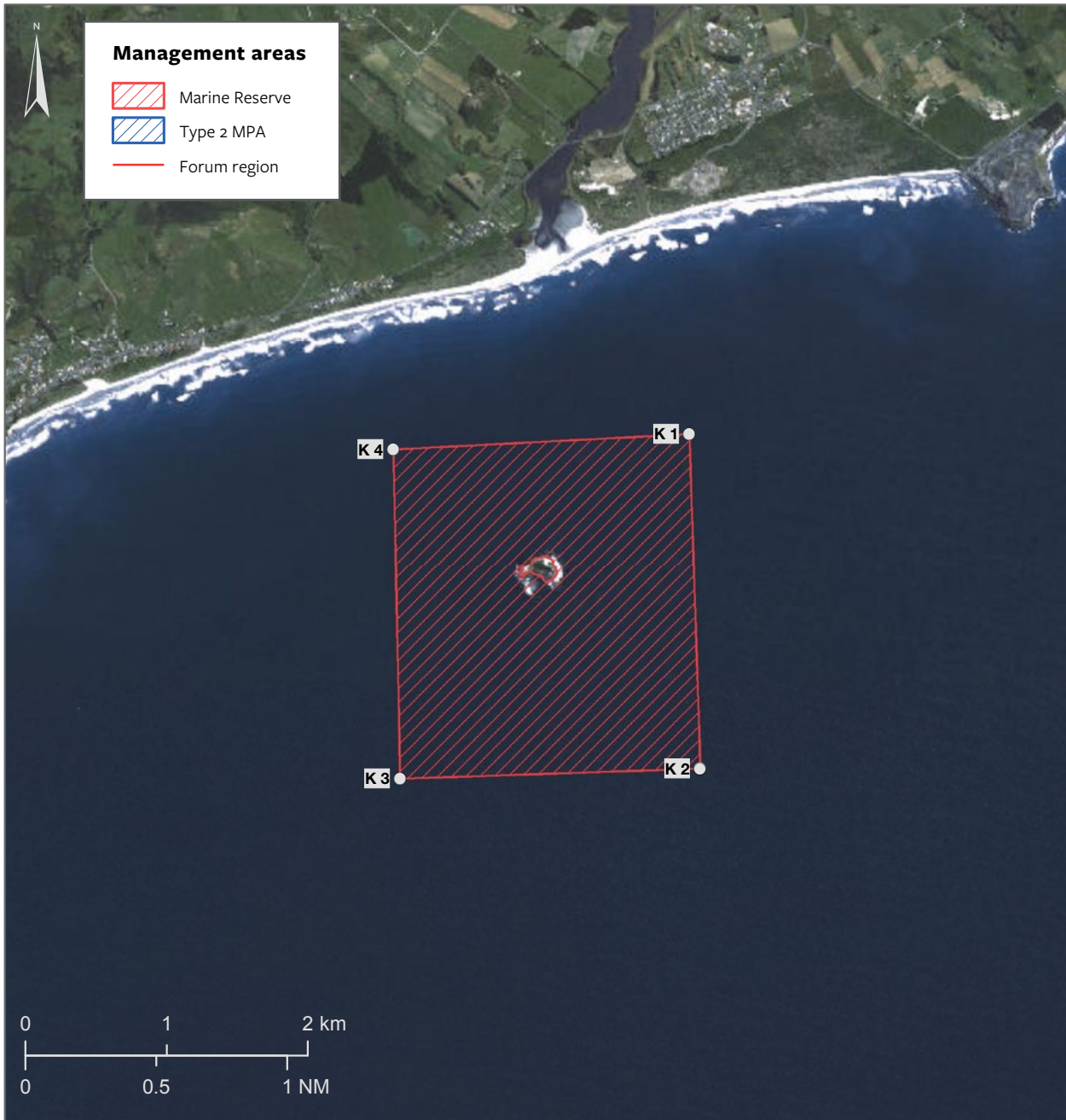


Figure 2-47: Broad-scale habitat map for Site K1 - Okaihae (Green Island)

* For legend, see inside back cover.

Figure 2-48: Location map for Site K1 – Okaihae (Green Island)



Index to Boundary Points		
Vertices	Latitude	Longitude
K 1	45° 56.666' S	170° 24.089' E
K 2	45° 57.947' S	170° 24.089' E
K 3	45° 57.947' S	170° 22.441' E
K 4	45° 56.688' S	170° 22.463' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
K1-K2	2375	1.282
K2-K3	2129	1.150
K3-K4	2338	1.262
K1-K4	2097	1.132



2.4.10 Akatorea Estuary – Site L1 (Type 2)

2.4.10.1 OVERVIEW

This site is only included in Network 1.

This site is the same as Site L in the Consultation Document (Figure 2-49).

Site L1 adjoins the proposed Akatore Coastal Marine Reserve (Site M1, Figure 2-52, Section 2.4.11). It contributes to Network 1 by representing estuarine habitats.

2.4.10.2 WHY THIS SITE HAS BEEN RECOMMENDED

Of the estuaries that have been considered for protection within the Forum region, Akatore Estuary ranks highly.

Akatore Estuary is one of the best estuaries for naturalness within the Forum region and is also relatively easy for people to visit. It includes significant saltmarsh – one of the best examples outside of The Catlins. Few environmental threats are associated with this site.

The Akatore Estuary catchment includes a wildlife management area in the upper reaches, and the northern bank borders an area that is protected by a QEII covenant. The proximity of the estuary to these protected terrestrial areas means that it is likely to be in a more natural state than an estuary surrounded by farmland. Added to this, the upper catchment is largely in forest, either native (in the gullies) or pine (on the interfluves).

All estuaries in the Otago area are listed in the Otago Regional Council's Regional Plan: Coast for Otago (the Coastal Plan) as coastal protection areas.¹⁶⁹ In regard to the Akatore Estuary, the Coastal Plan notes that '*Estuarine values such as nationally significant wildlife areas for waterfowl, waders and fernbirds, and whitebait can be found in the estuary*'.

The establishment of an MPA at this site will protect galaxiids (two species that occur here are known to be in decline) and higher-trophic-level fauna, particularly tuna (eels), from netting and commercial use. It will also maintain habitat for wading and other birds, particularly pied stilts (*Himantopus himantopus*) and fernbirds (*Bowdleria punctata*), both of which are at risk.

2.4.10.3 WHAT SUBMITTERS SAID

The majority of submitters supported Site L as contained in the Consultation Document

Those in support cited the importance of protecting an estuary with high biodiversity values, noting its significance as a nursery area for pātiki (flatfish), and habitat for shore- and seabirds. Protection for inaka (whitebait) and tuna (eels), and the opportunity to connect with a coastal reserve were considered important.

Science submitters particularly considered that the level of protection was not high enough. It was noted that this MPA will not significantly affect recreational fishing or the commercial tuna (eel) fishery. Eleven of the 72 statements from scientists that were particular to this proposal endorsed increased protection to support tuna (eel) and inaka (whitebait) populations from extraction, and endorsed a Marine Reserve status.

¹⁶⁹ In Schedule 2 of the Coastal Plan, coastal protection areas are defined as areas 'that are considered to be of regional, national or international importance in terms of their ecological and scenic values, and including those areas having spiritual or cultural significance'.

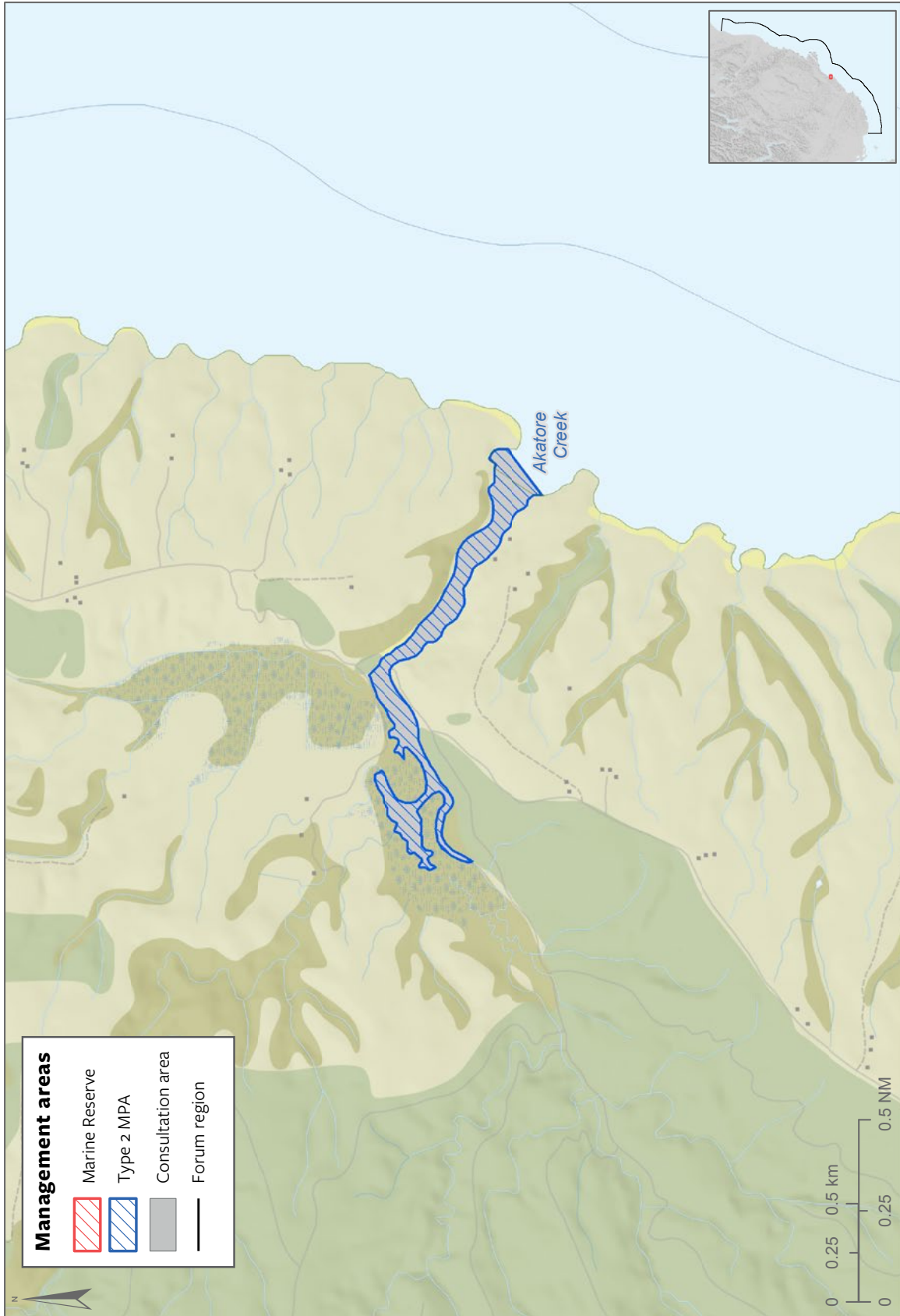


Figure 2-49: Site I.1 - Akatorea Estuary overview map

Those opposed to the site considered that local recreational fishers would be adversely affected, including those undertaking kohikohi inaka (whitebaiting) and flounder spearing (although this will not be banned), which are valued for lifestyle and recreational fishing for local families.

Table 2-29: Summary of submissions for Site L

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1223	737	0
Individual	173	88	18
Total	1396	825	18

2.4.10.4 ANALYSIS OF SITE L1

Table 2–30: Site L1 analysis – Meeting the Policy requirements

Site L1 Akatorea Estuary – Network 1	
Description	The proposed MPA with fishery restrictions includes the entire Akatore Estuary and incorporates 0.28 km ² of estuarine habitat. The boundary of this MPA adjoins the proposed Marine Reserve at Site M1 – Akatore Coastal.
Relationship to Consultation Document	This site is the same as was included in the Consultation Document.
Recommended management tool(s)/ protection standard	<p>Management tools</p> <ul style="list-style-type: none"> • A Type 2 MPA in which there will be: <ul style="list-style-type: none"> ◦ No dredging ◦ No set net fishing ◦ No commercial line fishing ◦ No mechanical harvesting (including spades for collecting shellfish) ◦ No fyke net fishing ◦ No kohikohi inaka (whitebaiting) ◦ Bottom disturbance and seismic testing associated with any activity. <p>Hand gathering, spearfishing, recreational line fishing, and the non-commercial gathering of paruparu (shellfish) and beach-cast kelp will be permitted.</p> <p>See Section 2.2.3 for further details on recommended protection tools.</p>
Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data	The proponents of Network 1 consider that Site L1 contributes to the representation of estuaries in the network. The Akatore Estuary includes approximately 1.7% of the estuarine habitat in the region.
Kāi Tahu cultural assessment ¹⁷⁰	<p>The name Akatore is a corruption of the traditional name Akatorea. In the Kāi Tahu dialect, the term for estuary or harbour ‘whanga’ becomes ‘aka’ as a result of dropping the ‘wh’ and replacing the ‘nga’ with ‘k’. ‘Tore’ should in fact be ‘tōrea’, which is the Māori name for pied oystercatcher. Thus, Akatorea means ‘the estuary of the tōrea’.</p> <p>The Akatore (Akatorea) Estuary is a customary mahika kai resource for whānau and hapū associated with this area of coast. For example, tuaki (cockles) found in the estuary are a traditional kai for Kāi Tahu whānau living in the area. The Otago Regional Council’s recognition of Akatore Estuary as a coastal protection area is due in part to its Kāi Tahu cultural and spiritual values.</p> <p>The Akatore Estuary is of particular interest to Taieri-based whānau of Te Rūnaka o Ōtākou, who utilise the estuary for customary gathering of tuaki (shellfish).</p> <p>Māori land and reserves</p> <ul style="list-style-type: none"> • Onumai, Taieri Māori Reserve lands (Blocks A, B and C) on the north side of the Taieri River, approximately 5 km to the north of Akatore Estuary. • Clarendon half-caste lands located on the south side of the Taieri River near the Taieri Mouth village. • Moturata (Taieri Island) – a portion of this island was vested in Te Rūnanga o Ngāi Tahu and subject to encumbrances described in Part A of Schedule 7 of the Ngāi Tahu Claims Settlement Act 1998. • There is strong customary interest associated with the island and surrounding fishery, which is the site of a historic kaika (settlement), urupa (burial ground), tauraka waka and kaimoana.

¹⁷⁰ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

Site L1 Akatorea Estuary – Network 1

Kaitiakitaka

The kaitiaki of customary rights located in Site L1 are with whānau and hapū of Kāi Taoka, Kāti Moki and Kāi Te Pahi, and administered through Te Rūnaka o Ōtākou. Local resident Kāi Tahu whānau are active in their kaitiaki function within the coastal area to the north and south of Taieri Mouth, including Akatore Estuary.

Whānau, hapū and fishers

The whānau and hapū who remain in the Taieri Mouth area have maintained a continuous and active role in all facets of fishery activity, be it customary, commercial or recreational.

Adverse impacts on existing users

Commercial fishing¹⁷¹

- Site L1 is expected to have minimal effects on commercial fishing other than eeling.
- Commercial eeling occurs within the catchment of the estuary. However, it is unknown how important the estuary is for the fishery due to the scale at which commercial tuna (eel) catches are reported. Any reduction in the available habitat for tuna (eel) fishing may impact on the commercial fishers, depending on whether they can catch their quota elsewhere and the impact of any such displacement of effort. There is no other known commercial fishing in the estuary.
- MPI does not have sufficient information from which to estimate displacement of the commercial eel fishery. However, the tuna (eel) fishing industry submission¹⁷² stated that the maximum annual catch for Site L1 would be 4.5 tonnes, with a median of 1.75 tonnes annually. This amounts to 6% displacement of the total allowable catch for the relevant tuna (short fin eel) quota management area, based on the median.

Recreational fishing

- The establishment of a Type 2 MPA at this site will have minimal impact on recreational fishing, with the exception of kohikohi inaka (whitebaiting) and net fishing for flounder.
- Tuaki (cockles) are likely to be taken from the estuary recreationally, which would still be allowed under the current proposal if collecting by hand.
- Recreational fishers may currently use set nets to take flounder from the estuary. Under the proposal for consultation, set netting would be prohibited.

Other impacts

Accessibility

For management:

- Management activities would have access from Akatore Road, where there is an approximately 1 km-long track leading to the mouth.
- Akatore Creek Road, a forestry road leading west off the main road just north of the bridge, runs alongside arms of the upper estuary.
- There is a wildlife management area in the northern reaches of the estuary and a QEII covenant on the north bank. Apart from along the road edges, the fringes of the estuary are largely in a natural condition.

For the public:

- The coast road and Akatore Creek Road offer good access through the centre and to some of the upper reaches of the estuary.
- For those that are prepared to walk a kilometre to the coast, Akatore Estuary and Creek provide good recreation alongside bush and wetland vegetation. Inland of the road are more extensive areas of saltmarsh and salt meadow.
- There is a forestry gate off Akatore Creek Road, but this is locked on weekends and outside operational hours.

Benefits

- Educational benefits for studying estuarine habitats, despite these still being subject to some extractions.
- Potential value for visiting and interpreting a near-natural estuary that has good access and is close to Dunedin.
- Potential for birdwatching.

¹⁷¹ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁷² Submission #1957

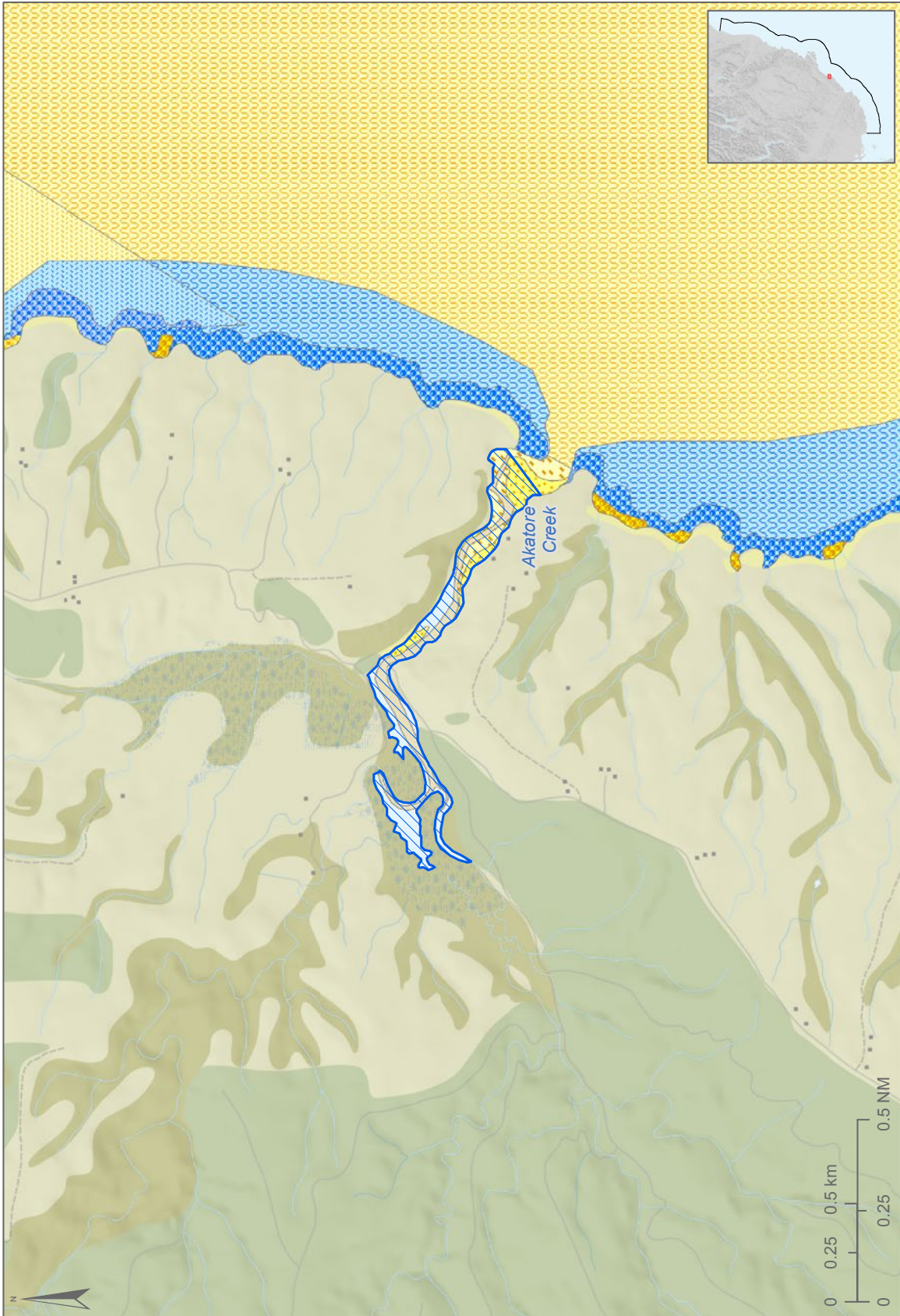


Figure 2-50: Broadscale habitat map for Site L1 - Akatorea Estuary

** For legend, see inside back cover.*

Figure 2-51: Location map for Site L1 – Akatorea Estuary



Index to Boundary Points		
Vertices	Latitude	Longitude
L 1	46° 6.707' S	170° 11.452' E
L 2	46° 6.796' S	170° 11.266' E

Distance between vertices		
Vertices	Distance (m)	Distance (Nm)
L1 - L2	292	0.158



2.4.11 Akatore Coastal – Site M1 (Marine Reserve)

2.4.11.1 OVERVIEW

This site is only included in Network 1.

This site is slightly smaller than the proposal that was included in the Consultation Document (Figure 2-52). This change is due to the site boundaries being simplified and its southern boundary being moved north to avoid Watsons Beach.

Site M1 contributes to the network by adding to the representation of two habitats.

2.4.11.2 WHY THIS SITE HAS BEEN RECOMMENDED

This site would replicate an example of exposed intertidal and shallow rocky reef. It would also potentially improve connectivity between the two other proposed Marine Reserves that include this habitat type (Sites I1 and K1), which are separated by approximately 100 km. Connectivity and replication are important considerations in creating a network.

This site includes a rare example of sea-exposed schist in the Forum region. Schist offers different habitat from other types of rocks – including intricate quartz veins and holes – and is an excellent habitat for intertidal and subtidal animals, including kōura papatea (rock lobsters).

Due to the geology of the area, in particular the schist landforms, the ecology is likely to be different from other parts of the coast.

Rocky reef habitats are limited to the immediate inshore area at this site, making it possible to protect inshore reef without needing to extend a Marine Reserve very far offshore. The rocky habitats include rock platforms with rock pools that the public can easily access.

The important *Macrocystis* kelp generally occurs in this area, although its presence can be intermittent due to sea conditions and sedimentation. This site lends itself to re-establishment of the historic kelp forest.

The proponents of Network 1 decided not to extend this area seaward due to the trawl fishery that occurs there, and because of Akatore Reef's importance for both commercial and recreational fishing.

The boundary was reduced from that consulted on to the first point north of Watsons Beach because submissions strongly argued that this represents a traditional family-focused recreational fishery. This was one of very few access points to the coast in the vicinity of the proposed MPA and the southern side of the beach has special significance to Kāi Tahu.

2.4.11.3 WHAT SUBMITTERS SAID

Many submitters provided input beyond their basic position on the Site M proposal and on the Site N Akatore offshore (Type 2) proposal that was also consulted on¹⁷³, with the primary focus requesting an offshore extension and a preference that there be one contiguous protected area. In general the majority of submitters saw this reserve as too small and wanted it extended to include off shore reefs and even out to the 12 NM limit to encompass a good range of habitats.

¹⁷³ Site N is not being recommended for inclusion in the network.

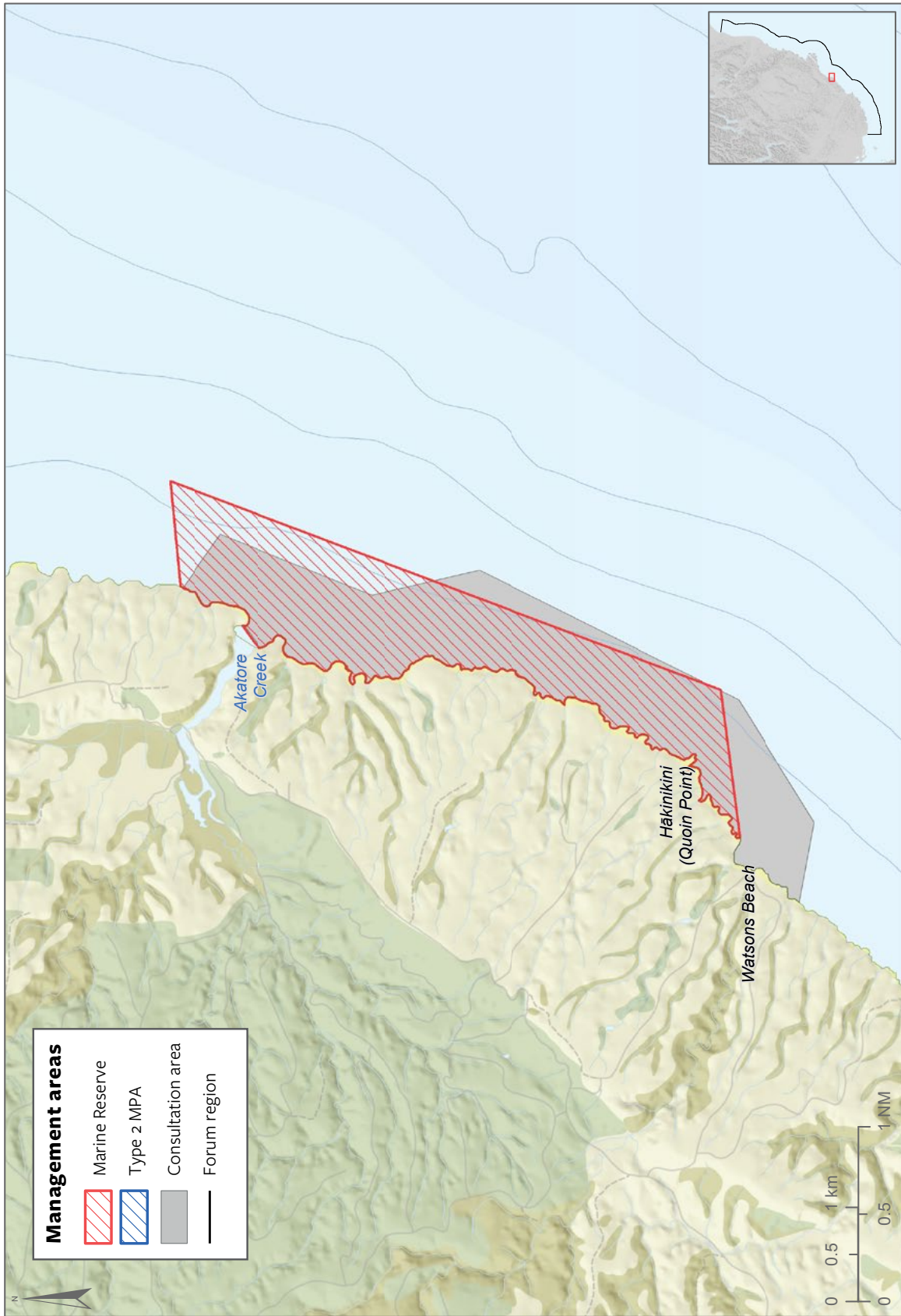


Figure 2-52: Site M1 - Akatore Coastal overview map

Science submissions used specific claims, evidence, and reasoning that the special habitat values represented by a combination of Sites L / M / N¹⁷⁴ were lacking in other MPA proposals. The combination of the Sites L / M / N proposal was supported as it would enable whole-life history management, but preferably as one unified MPA with boundaries modified to the 12 NM limit. There was also large endorsement for the fisheries restrictions proposed, but again supporting greater restrictions (15 statements) to maintain an area representative of the historical Otago coastal habitats.

In contrast, a number of other submitters including local submitters were concerned about the loss of their casual and commercial fishing access, noting in particular the importance of the pāua fishery for locals, the safe anchorages at Site M and the importance of the area for the small coastal vessels that operate out of Taieri Mouth. A theme from submitters in opposition was concern about the impact of the Marine Reserve on the local community.

Table 2-31: Summary of submissions for Site M

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1084	737	140
Individual	173	140	39
Total	1221	877	179

¹⁷⁴ Site N was a nearby offshore Type 2 that was consulted on but is not included as part of the recommended Network.

2.4.11.4 ANALYSIS OF SITE M1

Table 2–32: Site M1 analysis – Meeting the Policy requirements

Site M1 Akatore Coastal – Network 1	
Description	<p>This proposed Marine Reserve begins 0.8 km north of Akatore Creek and extends south along the coastline for approximately 6.5 km to just north of Watsons Beach. It extends approximately 0.6 to 1.3 km offshore.</p> <p>The proposed Marine Reserve includes 5.9 km² and accounts for approximately 0.1% of the area of the Forum region. It includes 9.3 km of coastline, which is approximately 1.2% of the overall coastline within the Forum region.</p>
Relationship to Consultation Document	<p>The site is slightly smaller than that included in the Consultation Document (which was 6.3 km²). The boundaries have been simplified and Watsons Beach has been excluded.</p>
Recommended management tool(s) ¹⁷⁵ / protection standard	<p>Marine Reserve.</p>
Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data	<p>The proponents of Network 1 consider that Site M1 includes two habitat types that contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Exposed Intertidal Reef: 8.4% of this habitat type within the region. Contributes to representation relatively well, at least for intertidal reef habitats north of The Catlins. • Exposed Shallow Reef: 2.9% of this habitat type within the region. Contributes to representation of this habitat type, but unlikely to adequately represent the habitat regionally. <p>It also includes two habitat types that, while present, are unlikely to contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Exposed Sandy Beach: 0.6% of this habitat type within the region. This proposal contains small fragmented examples of this habitat type and so is unlikely to represent the biodiversity of this broad-scale habitat type very well. • Exposed Shallow Sand: 0.5% of this habitat type within the region. Unlikely to represent this habitat type well due to the small area included, but may contribute to representation from other sites, particularly Site I1.

¹⁷⁵ For further details on existing management tools in the Forum region, see Section 2.3.

Site M1 Akatore Coastal – Network 1

Kāi Tahu cultural assessment¹⁷⁶

The coastline south of Akatore forms part of the Araiteuru traditional narrative, whereby the passengers of the waka Atua (waka of the Gods) ventured along the southern coast in search of firewood and resources, and in so doing named landmarks including Aonui (Cooks Rocks).

In traditional times, the coast from the Otago Peninsula south to the Mata-au (Clutha River) supported many villages, with the coastal routes by waka and on foot being the common means of travel. The estuaries, rivers, rocky reefs, islands and coastal area provided sustenance for locals and travellers alike.

The coastal strip adjacent to Site M1 contains archaeological values that indicate customary use of this coast over the generations by Kāi Tahu whānui.

Customary fisheries

The Akatore coast of Site M1 is rich in shellfish, including pāua and kutai (mussels), and also supports kōura papatea (rock lobster) and wetfish, all of which are of particular importance to Taieri-based whānau of Te Runaka o Ōtākou who have traditionally utilised this coastal area for customary fisheries.

Māori land and reserves

- Onumai, Taieri Māori Reserve lands (Blocks A, B and C) on the north side of the Taieri River, approximately 4 km north of the northernmost point of the Site M1 – Akatorea Coastal proposal.
- Clarendon half-caste lands on the south side of Taieri Mouth village, an area of approximately 40 hectares.
- Moturata (Taieri Island) – there is strong customary interest associated with this island and the surrounding fishery, with historic kaika, urupa and tauraka waka located 4 km north of the proposal.

Kaitiakitaka

The kaitiaki of the customary rights located in Site M1 are with whānau and hapū of Kāi Taoka, Kāti Moki and Kāi Te Pahi, and administered through Te Rūnaka o Ōtākou. The local whānau located on and around Taieri Mouth, Whānau Roopu, provide kaitiakitaka for the area.

Whānau, hapū and fishers

Whānau Roopu have proposed a mātaimai reserve for around Moturata (Taieri Island), but have not yet lodged an application.

The whānau and hapū who remain in the Taieri Mouth area have maintained a continuous and active role in all facets of fishing activity, be it customary, commercial or recreational.

A tākata tiaki for the Akatore area is opposed to the Site M1 Marine Reserve proposal.

Customary use, mātauraka, manaakitaka and commercial fishers

Kāi Tahu commercial fishers oppose Site M1 because of the strong traditions of intergenerational utilisation of the fishery and kaimoana extending over hundreds of years.

Kāi Tahu commercial fishers are concerned about the implications that a transfer of effort would have for Moturata (Taieri Island) and the surrounding waters.

Te Rūnaka o Ōtākou do not oppose Site M1. However, Te Rūnanga o Kāi Tahu do oppose Site M1 due to the effect that the potential transfer of fishing effort to the Moturata (Taieri Island) sea area would have on customary commercial fishing rights and interests.¹⁷⁷

¹⁷⁶ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

¹⁷⁷ Schedule 103 of the Ngāi Tahu Claims Settlement Act 1998.

Site M1 Akatore Coastal – Network 1

Adverse impacts on existing users

Commercial fishing¹⁷⁸

- There is a small but seasonally important pāua fishery in this area.
- The community of Taieri Mouth, an iconic seaside fishing village, live close to this site. Therefore, any impacts on commercial fishing in this area would likely have both economic and social impacts for them.
- The area seaward of the proposed MPA has been left open to fishing in recognition of where fishers can fish and to lessen the impact of marine protection measures on commercial fishing, particularly the local fishers.
- The most significant impact on commercial fishing is likely to be on kōura papatea (rock lobster) potting. Other fisheries that could be affected include pātiki (flatfish), papaka (paddle crab) and hoka (red cod). Because kōura papatea (rock lobster) has a high economic value, the impacts of displacement could be significant financially.

Based on SeaSketch reporting, the top three fisheries that will be displaced by Site M1 are:

- Pot – kōura papatea (rock lobster): 1%
- Line¹⁷⁹: 0.6%
- Trawl – pātiki (flatfish): 0.3%.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$228,000, based on a volume of 5,704 kg of fish.
- Of this, the main displacement would occur in the:
 - Kōura papatea (rock lobster) potting fishery – 1,709 kg, with an export value of \$201,000
 - Pātiki (flatfish) trawl fishery – 2,214 kg, with an export value of \$16,000.
- Seventeen fishers trawl in this area, with an average total of 61 trawl events at this site per year.
- Forty-eight fishers are thought to pot in the area or in the statistical area within which Site M1 is located.
- A total of 56 commercial fishers are thought to fish in this area or in the wider statistical area within which Site M1 is located, among whom:
 - Five fishers have catches of 480 kg or more that could be displaced, affecting between 0.3% and 3.3% of the individual fishers' catches within the relevant quota management areas.
 - The individual fishers with the top three maximum displacements of catch by volume could be:
 - 1,671 kg (1.5% of the fisher's catch)
 - 628 kg (0.3% of the fisher's catch)
 - 516 kg (3.3% of the fisher's catch).
 - Forty-four fishers would have 1% or less of their catch within the relevant quota management areas displaced.

¹⁷⁸ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁷⁹ Bottom longline and dahn line.

Site M1 Akatore Coastal – Network 1

Adverse impacts on existing users continued

Recreational fishing

- A range of views were expressed from recreational fishers. Some stated that the site is fished at low intensity, which is also reflected in the fact that it is not used commercially at high intensity, while others argued that the site is important.
- Submissions raised concern around the impact on 'fishing culture' – including recreational fishing by families. Submitters stated that the site is an important cultural and traditional area, and is used for club fishing and by crib owners and holiday makers. Some submitters are also concerned about the displacement of recreational pāua gathering.
- The Akatore Coastal area is a well-utilised recreational pāua-gathering area.
- Recreational diving for kōura papatea (rock lobster) and spearfishing occurs at a low intensity in this area.
- People with cribs in the area, for example at Bull Creek to the south, recreationally fish in this area. People from Taieri Mouth and Measley Beach also use the area, including for boat fishing.

Other impacts

Accessibility

- The site starts 1 km north of Akatore Creek mouth and extends south for approximately 10.5 km to just north of Watsons Beach. The proposed seaward boundary runs approximately 1 km offshore, parallel to the coast. The shoreline is uniformly rocky and interspersed with small sandy beaches and a narrow reef in places.
- The northern area is only accessible at low tide. There is a road at the south end at Watsons Beach. There are also two unformed legal roads to this section of coast.

For management:

- Access for management activities by public road is restricted to two places – Akatore Creek and the mouth of Watsons Creek (Watsons Road).

For enforcement:

- There are two land-based public access points – Akatore Creek mouth and Watsons Beach, near the southern end of the site.
- There is access at Taieri Mouth for boat-based activities.

For the public:

- There is limited public access as farmland backs the shoreline along the entire site. Watsons Beach is popular with local families, especially for recreational fishing.

Benefits

- Relatively safe place to educate children (rock pools).
- A rare example of an MPA linking coastal habitats with an estuary – includes a total of nine habitats. While relatively remote from main centres of population, Akatore Coastal would protect a distinctive section of coastal topography.
- Potential for ecotourism visits – rock pool life, seals and seabirds.
- Site M1 provides a good example of a wave-exposed shoreline and rock platforms, similar to that in Site I1, and so could be an alternative to Site I1 when considering the high impact at that site.
- The response of shallow subtidal and intertidal habitats to the removal of fishing will provide interesting topics for scientific study.
- The area provides opportunities to establish protected habitat types and populations of a range of exploited species, and will provide a greater understanding of marine ecosystems that could inform fisheries management.
- The area provides good intertidal and rockpool habitat that is very useful for scientific and educational purposes.

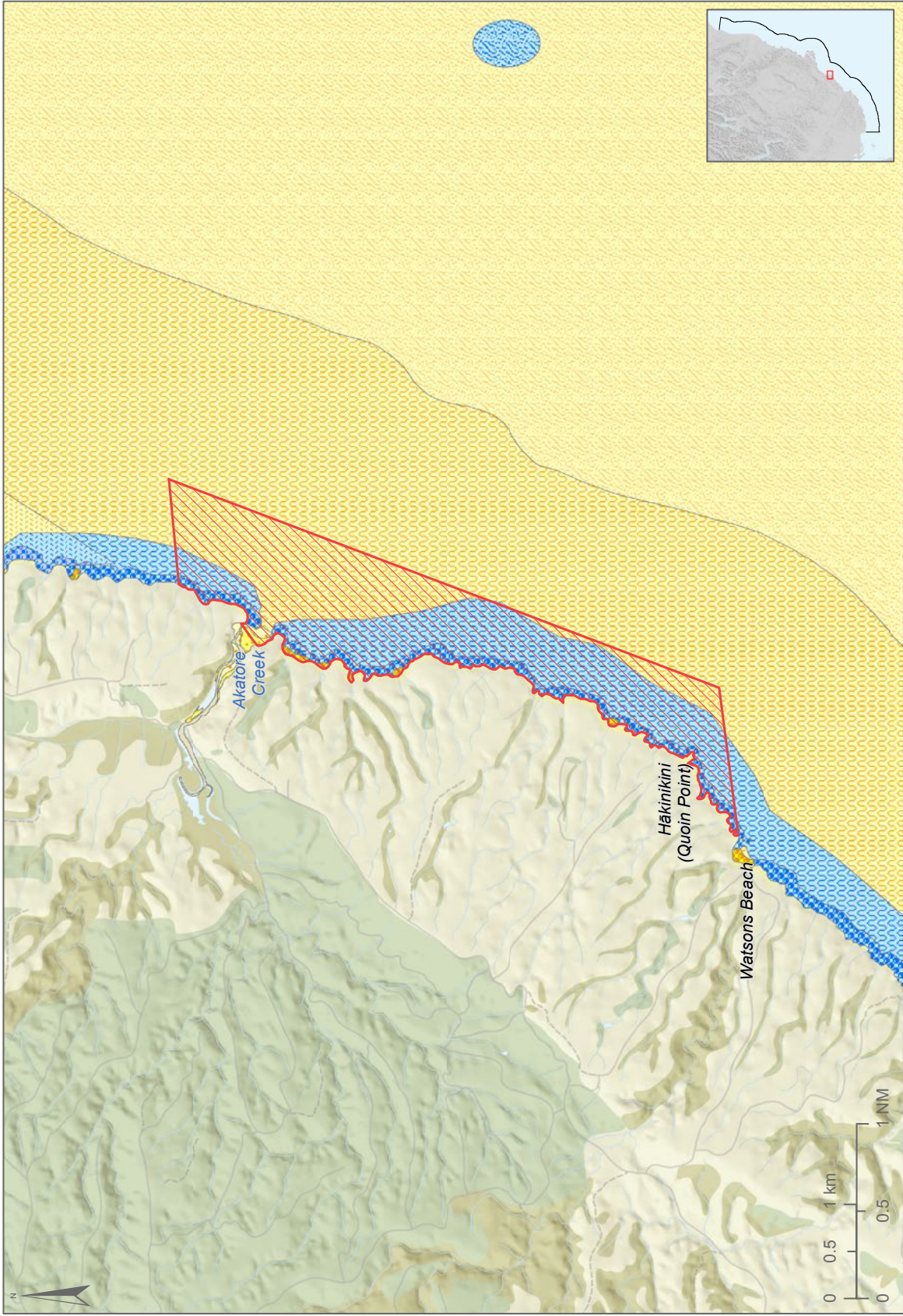
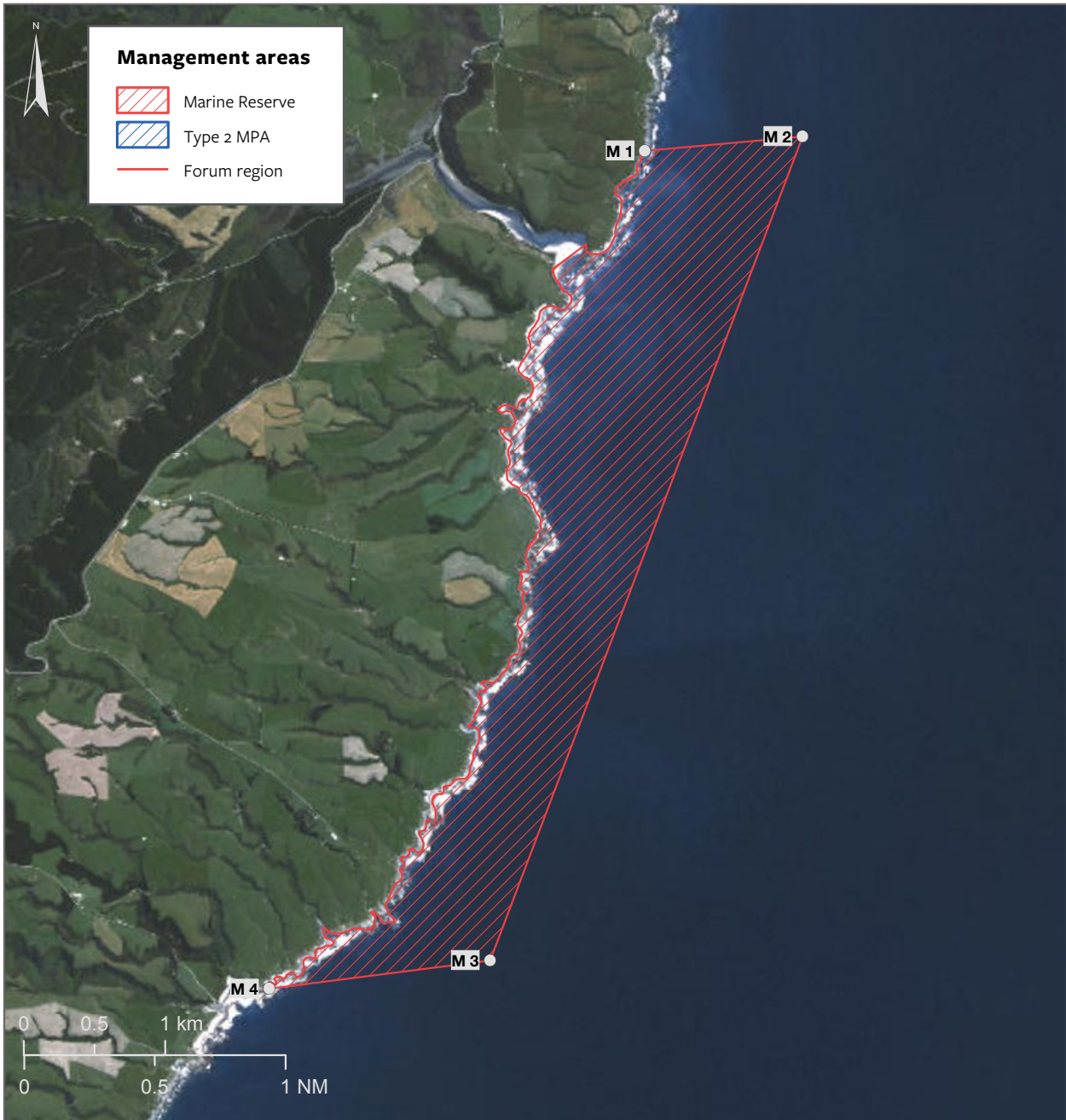


Figure 2-53: Broad-scale habitat map for Site M1 - Akatorea Coastal

** For legend, see inside back cover.*

Figure 2-54: Location map for Site M1 - Akatorea Coastal



Index to Boundary Points		
Vertices	Latitude	Longitude
M 1	46° 6.359' S	170° 11.792' E
M 2	46° 6.325' S	170° 12.663' E
M 3	46° 9.433' S	170° 10.783' E
M 4	46° 9.511' S	170° 9.563' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
M1 - M2	1123	0.606
M2 - M3	6248	3.374
M3 - M4	1577	0.852



2.4.12 Irihuka (Long Point) Site O1 (Marine Reserve)

2.4.12.1 OVERVIEW

This site is only considered within the Network 1 proposal.

Site O1 is supported by representatives for the sectors of environment, tourism, community, science and recreational fishing (one of two representatives). The site is opposed by representatives of Kāi Tahu the Treaty partner.

This site is slightly larger than the proposed Site O that was included in the Consultation Document. It includes an extension to the south of the site (not consulted on) to incorporate the full extent of deep reef habitat available. To address concerns expressed by commercial fishers regarding access, Site O1 also includes an 'anchoring zone' that would allow for some discharge to the reserve when cleaning fish while at anchor (Figure 2-55).

The potential contribution of Site O1 to the network (as well as the reasons for opposing its recommendation) is discussed below.

2.4.12.2 WHY THIS SITE IS RECOMMENDED BY THE NETWORK 1 PROPONENTS

The proponents of Network 1 support the establishment of this site as a Marine Reserve to complete a network that is, to the greatest extent possible, consistent with the MPA Policy. However, it is acknowledged that without the acceptance of Kāi Tahu and commercial fishers, the site has limited support within the Forum.

Site O1 would provide protection for a significant area of the coast that has very high biodiversity values, and which provides for the latitudinal representation of habitats and ecosystems in the southern extent of the Forum region. The addition of this site at the southern extent (within the Forum region) of the north-flowing Southland Current would strengthen the connectivity through the recruitment of more mobile species with long-lived larval stages from the south to the north.

This site includes a wide range of important habitats from a biodiversity perspective, and would provide a continuum of protected land and marine area. The coastal habitats included within this site represent the unique habitats of The Catlins coast and are not included in any other MPA within the proposed network.

As shown by the large number of iconic and protected species that utilise this area (i.e. seabirds and marine mammals), the habitats that this location would protect are ecologically significant and represent high biodiversity values. This proposed Marine Reserve includes areas of spectacular cliffed coastline, a sheltered bay, tidal rock pools, shallow and deep sand habitats, a vegetated nearby island, and a continuum of habitats from shallow waters through to deep reef.

The area of the proposed Marine Reserve is one of only two areas within the proposed network where rocky reef extends from the intertidal to deep subtidal region. The rocky reefs in the shallow areas are dominated by rimurapa (bull kelp) *Durvillaea* spp. forests to a depth of several metres. The understory contains a diverse mix of smaller kelp species and extensive areas of red algal species. This site is also a good habitat for juvenile pāua.

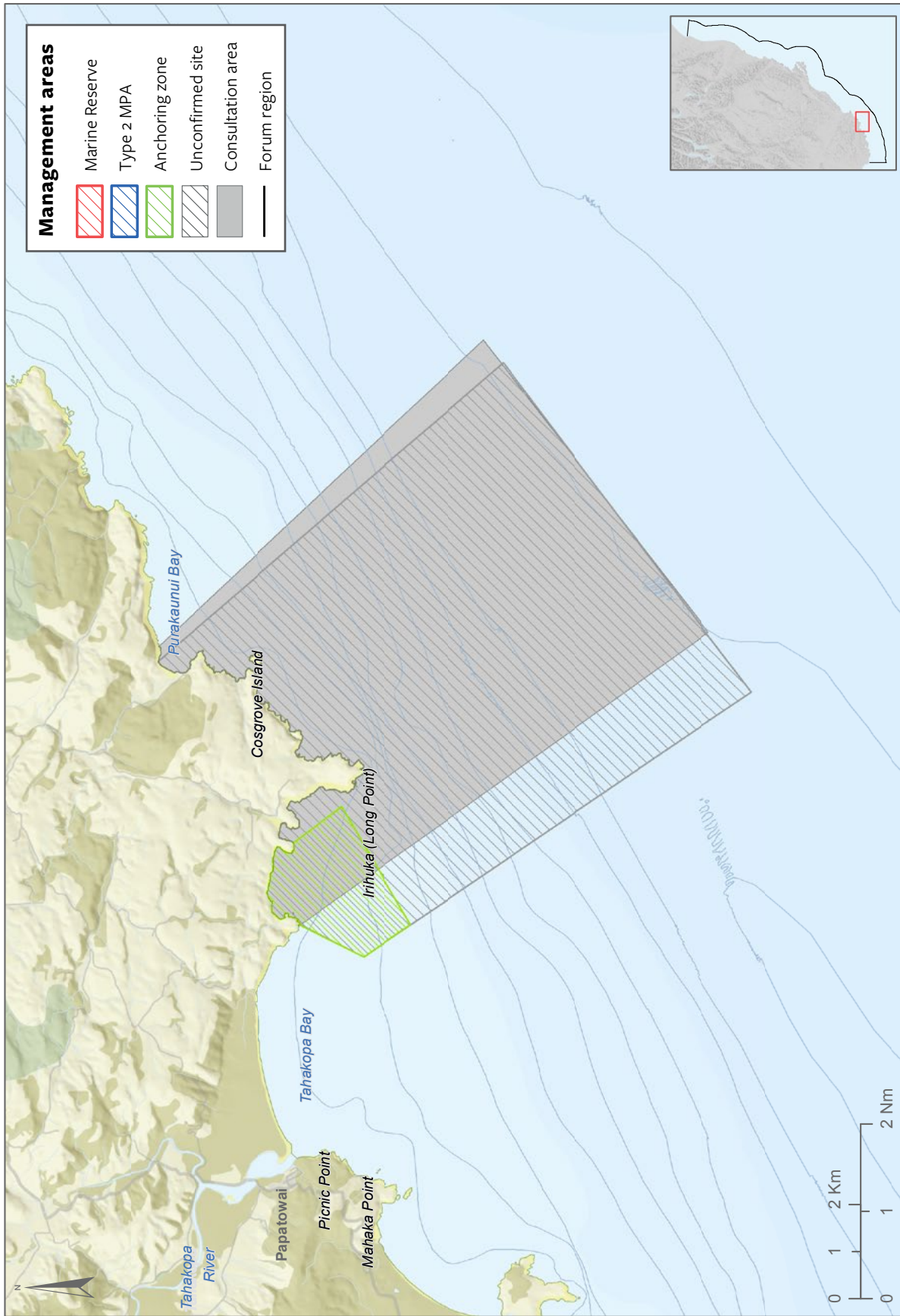


Figure 2-55: Site O1 - Irihuka (Long Point) overview map

The fish diversity of The Catlins includes species such as tākahaka (banded wrasse *Notolabrus fucicola*), spotty (*N. celidotus*), scarlet wrasse (*Pseudolabrus miles*), girdled wrasse (*N. cinctus*), greenbone (*Odax pullus*), marblefish (*Aplodactylus arctidens*), blue moki, rawaru (blue cod) and kohikohi (trumpeter). Pāua are also common around The Catlins coast.

The deeper sand areas within the site are structured by the currents and level of exposure. Large seabed features are easily seen in the seafloor terrain images and are well recognised as being important for biodiversity.

The area is visited by a range of seabirds, including koau (Otago shag), Foveaux shag (*Leucocarbo stewarti*), Salvin's mollymawk (*Thalassarche salvini*), Buller's mollymawk (*T. bulleri*), white-capped mollymawk (*T. cauta*), toroa (royal albatross), giant petrel (*Macronectes* spp.), Hutton's fluttering shearwater (*Puffinus* sp.) and kororā (little penguins). It is identified as an 'Important Seabird Area (IBA)'.¹⁸⁰

One of the most significant mainland clusters of hoiho (yellow-eyed penguin) colonies occurs adjacent to this area. The proposal includes a proportion of the habitat that is utilised by the hoiho (yellow-eyed penguins) from these colonies.¹⁸¹

Kekeno (New Zealand fur seals) breed here, and rāpoka (New Zealand sea lions), pahu (Hector's dolphins) and other dolphins are known to frequent this area.

The coastal land adjacent to the proposed site includes two scenic reserves (Purākaunui Bay and Irihuka (Long Point)), two Conservation Areas (Pillans Head and Chasm Island Bird Sanctuary) and land owned by the Yellow-eyed Penguin Trust.

2.4.12.3 TE RŪNAKA O AWARUA AND TE RŪNANGA O NGĀI TAHU

Irihuka (Long Point) is situated on the south-east coast of Murihiku. Ngāi Tahu whānau comprising Waitaha Kāti Māmoe are the manawhenua of Irihuka (Long Point), while the whānau and hapū of Te Rūnaka o Awarua hold manawhenua manamoana over this area.

The local whānau have opposed the Marine Reserve on the grounds that this would be a direct breach of their Treaty rights – the rights of their children and those yet to come would be alienated through this process.

Local whānau are active in their kaitiakitaka functions within this coastal area dependent upon the tides, weather and currents. This area encompasses a number of traditional fishing grounds that are still utilised today to manaaki the manuhiri on the marae and uphold the mana of whānau.

Te Rūnaka o Awarua educate their younger generations about traditional methods of mahika kai and sustainable management. Therefore, traditional methods of fishing and gathering of kaimoana and resources would become a memory to future generations.

From a wider perspective, Te Rūnanga o Ngāi Tahu also oppose this Marine Reserve on the basis of the displacement of fishing effort and customary rights to remaining fishing areas in the locality. Te Rūnaka o Awarua believe that their customary tools such as taiāpure and / or mātaimai reserves are effective in managing areas of significance.

¹⁸⁰ Forest & Bird 2014: New Zealand seabirds: important bird areas and conservation. The Royal Forest & Bird Protection Society of New Zealand, Wellington. The IBA areas can be viewed on a web map at <http://bit.ly/SeaSketchIBA>.

¹⁸¹ Ellenburg, U.; Mattern, T. 2012: Yellow-eyed penguin – review of population information. Department of Conservation Science Publication (POP2011-08). Department of Conservation, Wellington. This information can also be viewed on SeaSketch at <http://bit.ly/SeaSketchYEP>.

If this Marine Reserve was to be confirmed at Site O1 Irihuka (Long Point), Te Rūnaka o Awarua believe that the manawhenua would be excluded from further gains under their customary tools on this coastline. Te Rūnaka o Awarua remain steadfast in their opposition to this Marine Reserve. The following tribal whakatauki (proverb) reflects the aspirations of Te Rūnaka o Awarua:

Mō tātou, ā mō kā uri, ā muri ake nei!
For us and our children after us!

2.4.12.4 WHAT SUBMITTERS SAID

Many submitters expressed their views on Site O.

Stakeholder views on the extension to Site O1 are unknown, as it was not included in the Consultation Document.

Many submitters provided input beyond a basic position of support or opposition in respect of Site O. This included remarks concerning individual species protection (for intrinsic, economic or indicator value). Hoiho (yellow-eyed penguins) and other seabirds dominated these comments, along with the contribution that specific habitat representation of The Catlins would make to the southern coast's biodiversity. Some submitters requested offshore extension of the site to the 12 NM limit and some submitters suggested an alongshore extension. The lack of a proposal that encompasses Tokatā (The Nuggets) was a major feature of the submissions, but inclusion of this proposed area was broadly supported as an alternative. Several responses included the suggestion that the original proposals for Sites O, P and Q should be combined to form one effective and connected MPA that represents The Catlins.

The majority of supporting submitters sought that this site be extended to 12 NM offshore and inshore to include the Tahakopa Estuary, to better represent foraging habitats and ecosystems of the Irihuka (Long Point) hoiho (yellow-eyed penguin) colony (in addition to other seabirds), and estuarine habitats.

Site O attracted a significant number of local submissions given the small population, the majority of which opposed a Marine Reserve being established here.

The recreational fishing clubs that submitted unanimously opposed the establishment of a Marine Reserve at Irihuka (Long Point). This included significant safety concerns being raised regarding small boat safety in the area and the dangers of forcing smaller boats offshore to access fishing areas.

Those opposing the site (predominantly local), considered that it would disadvantage local fishers and their families (as they find it a safe and accessible site). These submitters also pointed out that this locale is a popular recreational pāua and diving area.

Submissions from the commercial sector were concerned about the impacts the Marine Reserve may have on commercial fishing for rawaru (blue cod), kōura papatea (rock lobster), pātiki (flatfish) and pāua, and the subsequent pressure the site's adoption would put on other areas.

In respect of pāua specifically, reference was made in submissions and at public meetings to the local and commercial efforts that have been placed into pāua re-seeding and voluntary protection, and concern about the effect a Marine Reserve would have on that work.

Table 2–33: Summary of submissions for Site O

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1083	737	141
Individual	157	276	39
Total	1240	1013	180

2.4.12.5 ANALYSIS OF SITE O1

Table 2-34: Site O1 analysis – Meeting the Policy requirements

Site O1 Irihuka (Long Point) – Network 1	
Description	<p>This proposed Marine Reserve reaches from Pillans Head to north of Purakaunui Bay, including Cosgrove Island. It extends approximately 7.5 km offshore from Irihuka (Long Point) on The Catlins coast.</p> <p>The site includes 76.2 km² of coastal area, which accounts for 0.9% of the Forum region. It includes 17.1 km of coastline, which is equivalent to 2.2% of the Forum region’s coastline.</p>
Relationship to Consultation Document	<p>Site O1 is located in the same area as the proposal for Site O included in the Consultation Document, but that proposal was smaller at 65.6 km².</p> <p>An offshore site (Site P) was also included in the Consultation Document which, together with Site O, would have provided protection for a continuum of habitats from the coast to the limit of the territorial sea.¹⁸²</p>
Recommended management tool(s) ¹⁸³ / protection standard	Marine Reserve.
Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data	<p>The proponents of Network 1 who recommend this site consider that Site O1 would include six habitat types that would contribute to the network’s representativeness:</p> <ul style="list-style-type: none"> • Deep Reef: 0.48% of this habitat type within the region. Patches of this habitat type occur across the region and the site would represent the deep reef of The Catlins. • Deep Sand: 1.2% of this habitat type within the region. This area would represent the southern inshore extent of this habitat type relatively well, but is unlikely to represent the northern extent of the habitat. • Exposed Intertidal Reef: 5.8% of this habitat type within the region. This proposal would represent the biodiversity of this broad-scale habitat relatively well within The Catlins. • Exposed Sandy Beach: 3.9% of this habitat type within the region. This proposal would represent the biodiversity of this broad-scale habitat type on The Catlins coast well. • Exposed Shallow Reef: 4.4% of this habitat type within the region. This proposal would represent the biodiversity of this broad-scale habitat type relatively well for The Catlins coast. • Exposed Shallow Sand: 2.3% of this habitat type within the region. This proposal would represent the biodiversity of The Catlins part of this broad-scale habitat relatively well. <p>Network 1 proponents acknowledge, however, that regional variation in these broad habitat types occurs down the coast, creating differences between The Catlins and the northern extent of these habitat types.</p>
Kāi Tahu cultural assessment ¹⁸⁴	<p>Kaimoana is often collected by Kāi Tahu whānau for special occasions on the marae. Traditional hāpuku (groper) fishing grounds are still utilised today. The area is easily accessible for older whānau and Kaumātua and is also an important site for the passage of mātauraka to rakatahi.</p> <p>Māori land and other reserves</p> <ul style="list-style-type: none"> • This site is in close proximity to the Maranuku Māori land blocks at Kaka Point. • There is a Statutory Acknowledgement for the Kuramea (Catlins River) under the Ngāi Tahu Claims Settlement Act 1998.

¹⁸² Site P is not being recommended for inclusion in the network.

¹⁸³ For further details on existing management tools in the Forum region, see Section 2.3.

¹⁸⁴ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

Site O1 Irihuka (Long Point) – Network 1

Kāi Tahu cultural assessment continued

- SILNA lands and Māori reserve lands are in close proximity.
- Mātaitai Reserve Te Puna - Wai Toriki at Kaka Point.

Kaitiakitaka

The kaitiaki of the customary rights located in the coastal area covered by Site O1 is undertaken by the whānau and hapū of Te Rūnaka o Awarua.

Customary use, mātauraka, manaakitaka and commercial fishers

- Kāi Tahu commercial fishers oppose any restrictions represented by MPAs.
- Te Rūnanga o Ngāi Tahu oppose Site O1 on the basis of displacement of fishing effort and the loss of customary rights. The principal values are mahika kai, kaimoana, wāhi taōka.
- This site has a known history and archaeological values.
- Access via Purākaunui is utilised by manawhenua to gather mahika kai.

Adverse impacts on existing users

Commercial fishing¹⁸⁵

Site O1 is significant for fishers from Waikawa, Taieri Mouth and Port Chalmers. Therefore, it is anticipated that it will have a significant impact on the exercising of commercial fishing rights, including for pāua and kōura papatea (rock lobster), and bottom trawl fisheries (especially for pātiki (flatfish)).

The proposal provides for fishing vessels to anchor and clean fish within the Marine Reserve in recognition of the practice of commercial vessels anchoring here during north-easterly winds.

Pāua

- Over the last 5 years, Site O1 has contributed an average of 4.4% of the PAU5D total allowable commercial catch, which equates to an average of 8.3% of the PAU5D catch when taking into account shelving (pāua are currently under-caught in this area due to voluntary shelving of 30% of the annual catch entitlement).¹⁸⁶
- There is a voluntary closure along the western side of Irihuka (Long Point), which was put in place to make better provision for non-commercial pāua harvesting by the local community in the area.
- The displacement effect of Site O1 on pāua fisheries has the potential to be significant, because pāua is a sedentary species, making it vulnerable to any additional fishing pressure at a site. Three voluntary closures to commercial pāua fishing currently apply in the vicinity of Site O1.

Kōura papatea (rock lobster)

- In 2013, commercial kōura papatea (rock lobster) fishers received access to the northern part of this area after years of closure (the area has now been added to the CRA 7 fisheries management area). Prior to 2013, the northern part of the area (from Irihuka (Long Point) northwards) was closed as part of a buffer zone for the Otago kōura papatea (rock lobster) concession area.¹⁸⁷ It is more highly valued now than it was at that time.
- Kōura papatea (rock lobsters) migrate progressively down the coast, so the longer they have been moving, the older and larger they are. This provides opportunity for the commercial take of different-sized kōura papatea (rock lobsters), depending on the value of the market.

Trawling

- The proposal includes areas of high-intensity trawling and is therefore important to the commercial fishing industry. Substantial trawling is carried out just off Irihuka (Long Point) and Cosgrove Island, where higher concentrations of fish occur.

¹⁸⁵ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁸⁶ Information taken from Fishing Industry submission #2467.

¹⁸⁷ The legal size for kōura papatea (rock lobster) is lower in the Otago concession area than other parts of the kōura papatea (rock lobster) fishery.

Site O1 Irihuka (Long Point) – Network 1

Adverse impacts on existing users continued

Commercial fishing continued

Based on SeaSketch reporting, the top three fisheries that will be displaced by Site O1 are:

- Trawl – pātiki (flatfish): 6.6%
- Dive – pāua: 5.7%
- Trawl – hoka (red cod): 1.9%.

Noting the limitations set out in Section 2.4.1, MPI estimates:

- The export value of potentially displaced fisheries at \$411,000, based on a volume of 63,160 kg of fish.
- Of this, the main displacement would occur in the:
 - Pātiki (flatfish) trawl fishery – 32,450 kg, with an export value of \$233,600
 - Pāua dive fishery – 2,738 kg, with an export value of \$64,600
 - Stargazer trawl fishery – 5,120 kg, with an export value of \$26,100
 - Kōura papatea (rock lobster) potting fishery – 95 kg, with an export value of \$11,100
 - Muheke (arrow squid) jig fishery – 3,459 kg, with an export value of \$10,700
 - Mako repe (elephant fish) trawl fishery – 1,584 kg, with an export value of \$8,300
 - Hoka (red cod) trawl fishery – 4,742 kg, with an export value of \$7,100.
- Thirty-six fishers trawl in this area, with an average total of 296 trawl events at this site per year.
- A total of 80 commercial fishers are thought to fish in this area or in the wider statistical area within which Site O1 is located, among whom:
 - Nine fishers have catches of 1,800 kg or more that could be displaced, affecting between <0.1% and 7.3% of the individual fishers' catches within the relevant quota management areas.
 - The individual fishers with the top three maximum displacements of catch by volume could be:
 - 15,130 kg (7.3% of the fisher's catch)
 - 12,349 kg (6.7% of the fisher's catch)
 - 6,537 kg (2.3% of the fisher's catch).
 - Sixty-two fishers would have 1% or less of their catch within the relevant quota management areas displaced.

Recreational fishing

- This site will have recreational fishing benefits from the spillover of larval transport and spawning aggregations.
- There was some support for this site from recreational fishers in order to leave Tokatā (The Nuggets) and other areas unaffected.
- This proposal will impact on some crib owners and families in The Catlins who have fished there for generations.

This area is a well-used recreational area, particularly by fishers from the south, both for rock fishing and boat fishing. Species taken recreationally from the area include pāua, kutai (mussels), rawaru (blue cod), jock stewart (*Helicolenus percoides*) and kōura papatea (rock lobster).

Site O1 Irihuka (Long Point) – Network 1

Other impacts

Accessibility

For management:

- Purakaunui Bay, a popular surfing spot, provides access from the north. The only other road access is via Irihuka (Long Point) Road to Helena Falls Beach, just west of Irihuka (Long Point).
- Management activities would be best undertaken by boat as this coastline is indented by numerous cliff-bound bays and beaches.

For enforcement:

- Boats could be launched from Purakaunui Bay.
- Land-based observation is possible.
- Pounaweia, Tahakopa and Tokatā (the Nuggets) provide other options for launching boats depending on conditions.

For the public:

- Good access from Helena Falls Bay.
- Good access at Purakaunui Bay western headland.
- Note the entire reserve is easily accessible.

Access to the north end would be via Department of Conservation land at Purākaunui Bay and around the shore line. In the south, there is road access to Helena Falls Beach. Access to Irihuka (Long Point) is available through the Yellow-Eyed Penguin Trust land. Most of the area is accessible by boat in calm conditions.

At present, the area is used by the local community for access to fishing, diving and surfing. These activities are allowed, and partly facilitated by, the Yellow-Eyed Penguin Trust at Irihuka (Long Point) and by Department of Conservation land at Purākaunui Bay.

Benefits

- The Marine Reserve would attract divers.

Tourism

- Indirect benefits for wildlife tourism through the protection and enhancement of research opportunities into valuable marine mammals, penguins and other seabirds.
- Direct tourism benefits in the form of onsite wildlife viewing, which is a growing tourism industry.
- Good for The Catlins tourism image – this could become the main MPA visitor attraction in The Catlins region in the long term.
- The Marine Reserve could enhance the diving experience in the channel between the shore and Cosgrove Island due to the expected recovery of exploited species and the subsequent effects of protection.

Science

- This is an excellent option for a large Marine Reserve in The Catlins area. It would provide educational and research opportunities, and enable studies that focus on a recovering ecosystem.
- This is a relatively remote area but access by land and boat for research purposes is possible when conditions are appropriate. The area provides opportunities to study a range of wave-exposed reef and soft-sediment habitat types that extend from the intertidal area to relatively deep water.
- The high biodiversity values at this site make it valuable for scientific research. The area provides opportunities to establish protected habitat types and populations of a range of exploited species, will provide a greater understanding of marine ecosystems, and could inform fisheries management.

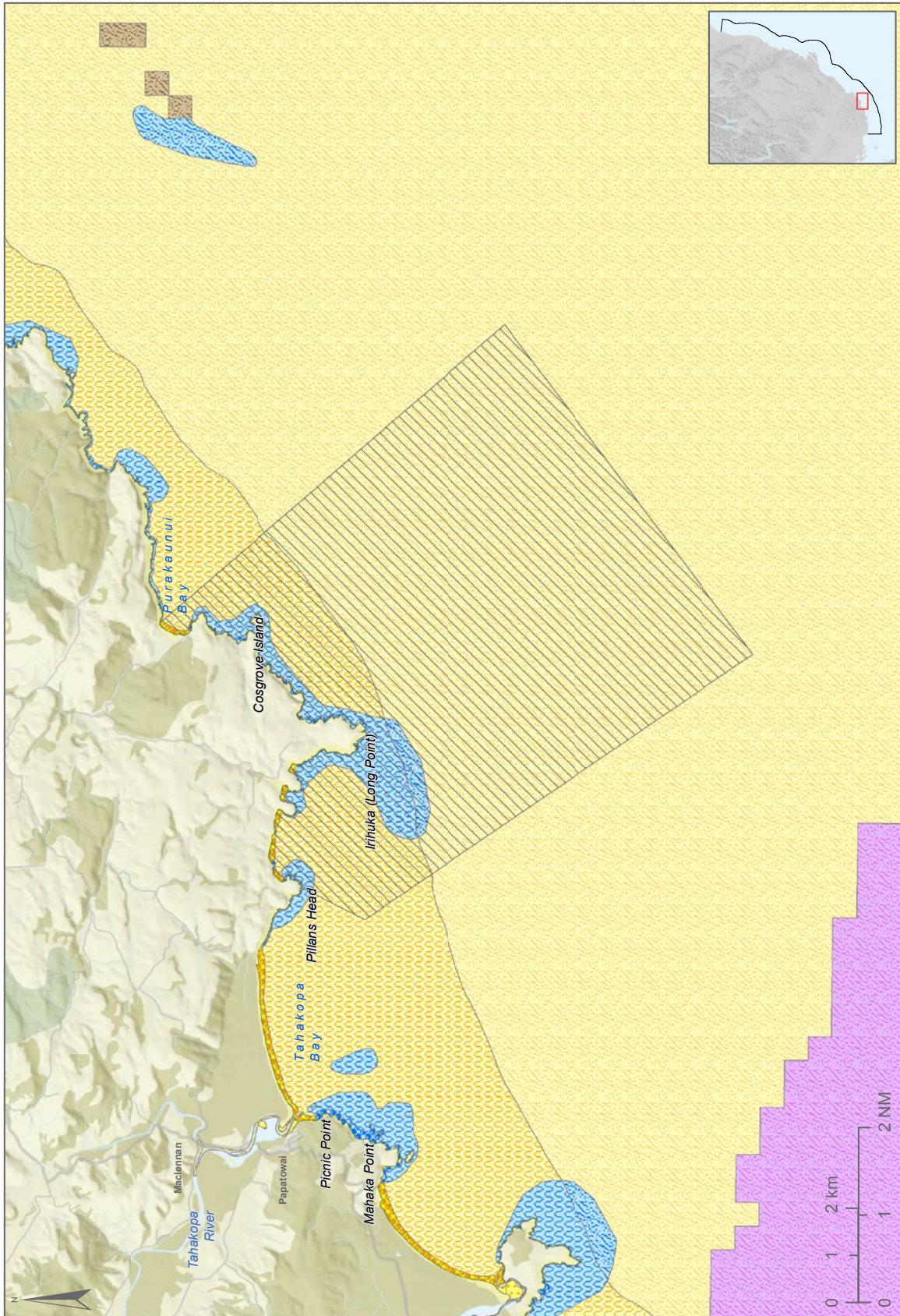
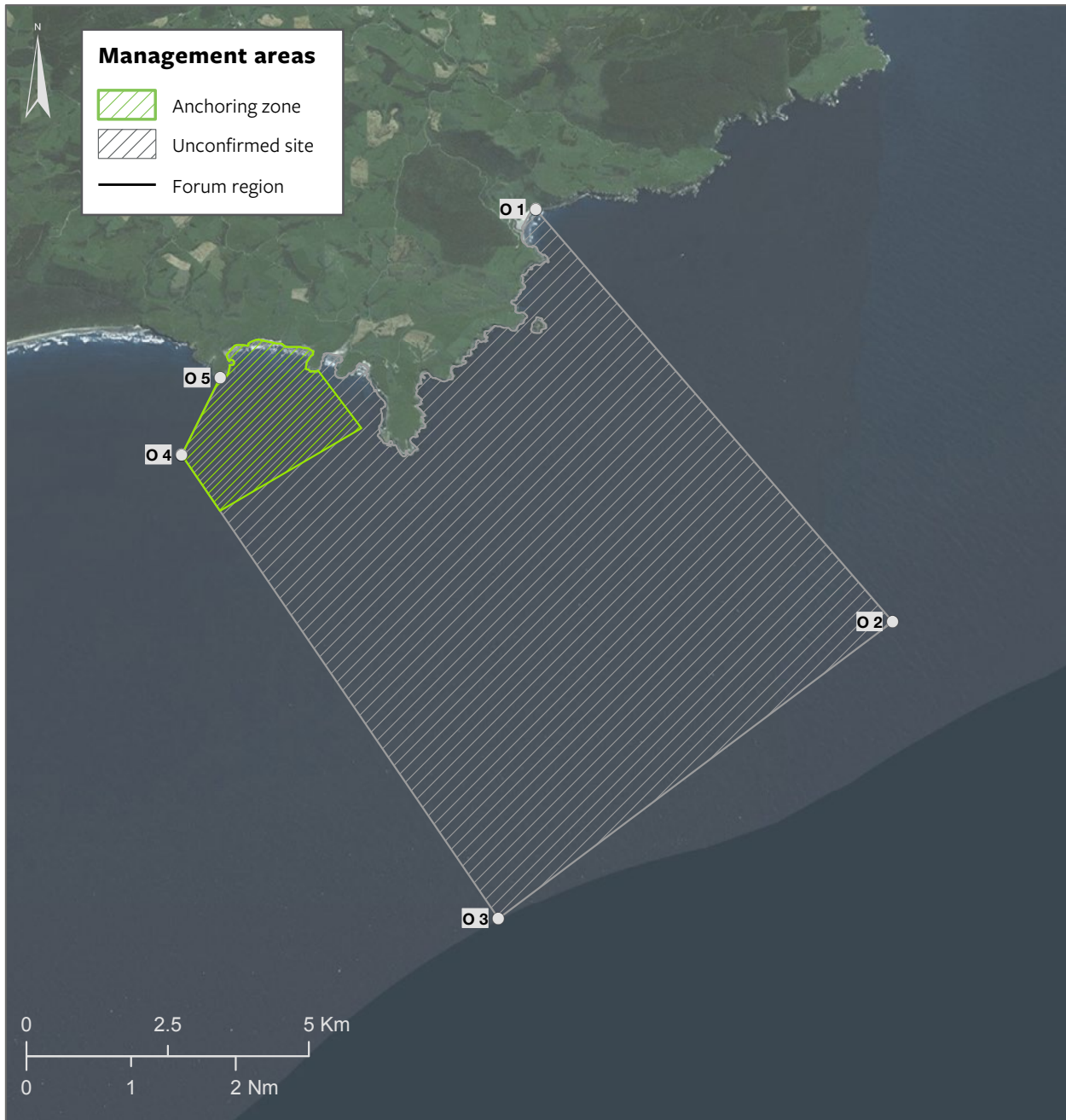


Figure 2-56: Broad-scale habitat map for Site O1 - Irihuka (Long Point)

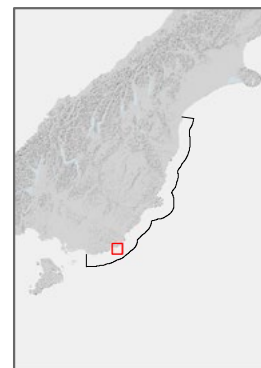
** For legend, see inside back cover.*

Figure 2-57: Location map for Site O1 - Irihuka (Long Point)



Index to Boundary Points		
Vertices	Latitude	Longitude
O 2	46° 36.492' S	169° 41.668' E
O 3	46° 39.166' S	169° 36.023' E
O 4	46° 34.604' S	169° 31.909' E
O 5	46° 33.888' S	169° 32.492' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
O1 - O2	9669	5.221
O2 - O3	8746	4.722
O3 - O4	9955	5.375
O4 - O5	1523	0.822



2.4.13 Tahakopa Estuary – Site Q1 (Type 2)

2.4.13.1 OVERVIEW

This site is only included in Network 1.

Site Q1 includes an extension to Site Q as included in the Consultation Document and has been given a Type 2 MPA protection level, which was also not included in the consultation process (Figure 2-58).

The area would provide recognition and protection for part of a relatively pristine estuary, with significant ecological values.

Network 1 proponents acknowledge that the restrictions would result in the alienation of customary rights.

2.4.13.2 WHY THIS SITE HAS BEEN RECOMMENDED

The estuarine habitats in The Catlins tend to occur in catchments surrounded by bush, meaning that less sediment will enter them and they will be in a less modified state than estuaries with more developed catchments.

The proponents of Network 1 have recommended this site because of its particular qualities, and because it may have fewer adverse impacts on existing users compared with alternative locations.

The western side (left bank) of the Takahopa Estuary is unmodified mudflats with a small area of saltmarsh turf and an extensive area of tall jointed rush (*Juncus articulatus*). This intricate area of wetland is of special significance for wading birds and inaka (whitebait) breeding. Pātiki (flatfish) are also a feature of the estuary's biodiversity. Saltmarsh has been removed by human actions elsewhere in this estuary. The proposal would protect and /or allow the restoration of what remains.

The protected area would be flanked by the Papatowai Scenic Reserve, Tahakopa Bay Scenic Reserve, Shank's Bush private QEII Reserve (two-thirds) and public road (one third).

2.4.13.3 WHAT SUBMITTERS SAID

The majority of submitters supported Site Q as contained in the Consultation Document

Since the option of protecting the entire estuary in a Type 2 MPA was not included in the Consultation Document, indications of support or opposition to the recommended site and tools are not available. However, several submitters suggested Type 2 status and a significant number asked for full Marine Reserve status.

Te Rūnanga o Ngāi Tahu oppose this proposal on the basis of the displacement of fishing effort and the alienation of customary rights, including the loss of mahika kai.

The Southland Conservation Board asks that the Forum respects the views of Kāi Tahu.

The Otago Regional Council's recognition of Tahakopa Estuary as a coastal protection area is due in part to its Kāi Tahu cultural and spiritual values.¹⁸⁸

¹⁸⁸ Schedule 2, The Regional Plan: Coast for Otago, page 18-18.



Figure 2-58: Site Q1 – Takahopa Estuary overview map

Tuna (eel) fishers have expressed concern about the loss of take from all estuaries, including Tahakopa Estuary, which is an important tuna (short fin eel) fishery. Inland tuna (short fin eels) are caught commercially with fyke nets during flood events, and estuary tuna (eels) tend to be in the best condition and of the highest quality.

Table 2-35: Summary of submissions for Site Q

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1083	737	140
Individual	134	147	41
Total	1217	884	181

2.4.13.4 ANALYSIS OF SITE Q1

Table 2-36: Site Q1 analysis – Meeting the Policy requirements

	Site Q1 Tahakopa Estuary – Network 1
Description	This site extends south-east from the identified coastal marine area boundary to the mouth of the Tahakopa Estuary. The proposed area contains 0.7 km ² of estuarine habitat.
Relationship to Consultation Document	The option consulted on for this site was for half of the estuary to be protected as a Marine Reserve. Site Q1 is now recommended for the entire estuary as a Type 2 MPA.
Recommended management tool(s) ¹⁸⁹ / protection standard	Type 2 MPA in which there will be: <ul style="list-style-type: none"> o No dredging o No set net fishing o No commercial line fishing o No mechanical harvesting (including spades for collecting shellfish) o No fyke net fishing o No kohikohi inaka (whitebaiting) o Bottom disturbance and seismic testing associated with any activity. Hand-gathering, spearfishing, recreational line fishing, and the non-commercial gathering of paruparu (shellfish) and beach-cast kelp will be permitted.
Representativeness (sufficient extent and quality to meet the protection standard) – see Appendix 1.1 for complete habitat data	The proponents of Network 1 consider that Site Q1 contributes to the representation of estuaries in the network.
Kāi Tahu cultural assessment ¹⁹⁰	<p>The Tahakopa Estuary was and still is utilised as an important mahika kai for local whānau to manaaki manuhiri on the marae and uphold the mana of the marae of Te Rūnaka o Awarua. Tahakopa Estuary has extensive wāhi tapu and wāhi taōka sites, with carbon dating providing evidence that it includes some of the oldest archaeological sites known in Aotearoa (New Zealand).</p> <p>Kōkōpu (native trout <i>Galaxias</i> spp.) were once abundant in the Tahakopa River, the name of which is a reference to their name. Inaka (whitebait) are a taoka species and are part of the Kāi Tahu traditional gathering practices.</p> <p>Tahakopa Estuary is adjacent to the SILNA lands and Māori Reserve land at Tautuku. Tauraka waka landings on this estuary are talked about in old manuscripts.</p> <p>The estuary is regularly used by whanau to gather mahika kai and launch waka ama. Customary practices are used to educate and engage (transfer intergenerational mātauraka) mokopuna, tamariki and rakatahi in traditional gathering practices. Tahakopa Estuary contains known sites of significance where they are taught how to gather from a traditional mahika kai perspective and distinguish different species of fish.</p>

¹⁸⁹ For further details on existing management tools in the Forum region, see Section 2.3.

¹⁹⁰ Refer to Section 2.4.1 – Cultural significance for general information that is common to all of the sites.

Site Q1 Tahakopa Estuary – Network 1

Kāi Tahu cultural assessment continued

Tahakopa Estuary holds the mauri¹⁹¹ (life force) and the essence that bonds Kāi Tahu whānui. This area has spiritual significance and is used for practices that have travelled through the generations, so the establishment of an MPA would extinguish the spiritual connections and interests of the whānau.

Localised values include:

- This site is in close proximity to SILNA lands, which were recognised in the Wai 158 claim.
- Tautuku block A and Tautuku Peninsula Māori Reserve are also in close proximity.
- Maranuku Māori Reserve at Kaka Point was also recognised under the Kāi Tahu Ancillary Claims Report 1996.
- There is a Statutory Acknowledgement¹⁹² for the Kuramea (Catlins River) under the Ngāi Tahu Claims Settlement Act 1998.
- There is an extensive wāhi taōka and wāhi tapu along the river bed, in which many artefacts and kōiwi are being uncovered by natural erosion on a regular basis.
- The estuary and tributaries within the rohe were and still are a valuable and significant source of mahika kai for the whānau from this area, and the area is also extensively used for other customary purposes. The establishment of a Type 2 MPA will not accommodate the mahika kai traditions of which estuaries are a part.

Kaitiakitaka

Local Kāi Tahu whānau are active in their kaitiakitaka functions in this area. The kaitiaki of this site is undertaken by the whānau and hapū of Awarua takiwā and administered through Te Rūnaka o Awarua.

Adverse impacts on existing users

Commercial fishing¹⁹³

- Commercial set netting is already prohibited throughout this site, commercial line fishing is non-existent and the mechanical harvesting of shellfish in an area that will not support a sanitation programme is unlikely.
- Commercial eeling occurs within the catchment of the Tahakopa Estuary. However, it is unknown how important the estuary is for this fishery due to the scale at which commercial tuna (eel) catches are reported. Any reduction in the available habitat for tuna (eel) fishing may impact on the commercial fishers, depending on whether they can catch their quota elsewhere and the impact of any such displacement of effort.
- MPI does not have sufficient information from which to estimate displacement of the commercial eel fishery. However, the tuna (eel) fishing industry submission¹⁹⁴ stated that the maximum annual catch for Site Q (as consulted on) would be 5 tonnes, with a median of 2.75 tonnes annually, which equates to 9.5% displacement of the total allowable catch for the relevant tuna (short fin eel) quota management area, based on the median.
- There is no other known commercial fishing in the estuary.

Recreational fishing

- This proposal allows for continued recreational fishing in the estuary but places limitations on bulk-extraction methods such as netting and the use of digging tools. Therefore the recreational set netting that currently occurs in the estuary would be affected, but spearfishing, and line fishing for trout and other fish can continue.
- Kohikohi inaka (whitebaiting) and floundering (by set net) would be affected by this proposal.

¹⁹¹ Refer to Section 1.1.8 Statutory Acknowledgments.

¹⁹² Refer to Section 1.1.8 Statutory Acknowledgments.

¹⁹³ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

¹⁹⁴ Submission #2467.

Site Q1 Tahakopa Estuary – Network 1

Adverse impacts on existing users continued

Resource consents

A nearby landfill has a consent to discharge leachate into the northern side of the estuary, subject to monitoring conditions.

Other impacts

Accessibility

For management:

- Management activities could readily access the reserve from the river or nearby roads.

For enforcement:

- Relatively easy enforcement would be possible by boat on the river or from nearby roads.

For the public:

- Public access is available to most of the estuary from the beach and road. The upper western shore requires boat access.

Benefits

- This site would offer families and visitors an educational experience of estuarine habitats in a natural condition.
- Indirect tourism value through the protection of wading birds and their food supply.
- The establishment of a protected area at this site would highlight the natural values of an area adjacent to a high-use tourist route. The proposed area is highly visible from the scenic highway, and the estuary as a whole is much visited via various walks and access points.
- This MPA will provide habitat for:
 - Tuna (eels)
 - Inaka (whitebait)
 - Spoonbills
 - Bittern – Threatened
 - Mata (fernbird *Megalurus punctatus*)
 - Pied stilt – Declining
 - Native fish, including redfin bully (*Gobiomorphus huttoni*) – At Risk / Declining
 - Kanakana (lamprey).

Adverse effects (other than fishing)

- A cultural tourism / education concession is currently being developed for the site, which may be prevented/impacted by the proposal.

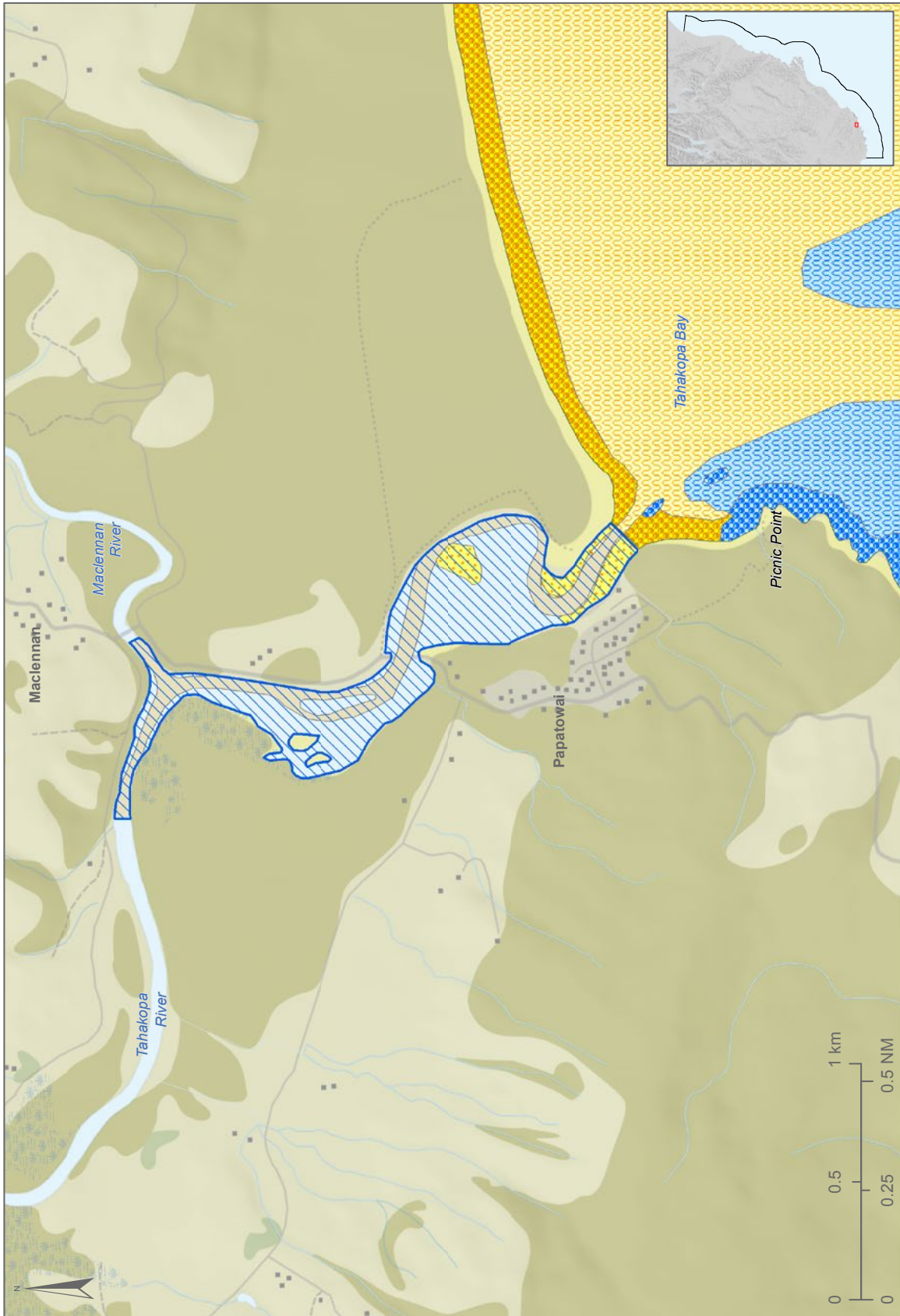


Figure 2-59: Broad-scale habitat map for Site Q1 - Takahopa Estuary

** For legend, see inside back cover.*

Figure 2-60: Location map for Site Q1 - Takahopa Estuary



Index to Boundary Points		
Vertices	Latitude	Longitude
Q 1	46° 32.548' S	169° 27.794' E
Q 2	46° 32.511' S	169° 27.796' E
Q 3	46° 33.676' S	169° 28.701' E
Q 4	46° 33.735' S	169° 28.606' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
Q1 - Q2	69	0.037
Q3 - Q4	162	0.087



2.4.14 Kelp Forest – Site T1 (Type Other)

2.4.14.1 OVERVIEW

This site is only included in Network 1 and has not been changed since consultation.

Macrocystis pyrifera kelp forests are important biogenic habitats that support biodiversity and provide ecosystem services in the Forum region. Site T1 is proposed separately from the other recommendations because this prohibition does not meet the protection standard but does contribute to the objective of the MPA policy by directly enhancing biodiversity protection.

Macrocystis is managed under the Quota Management System. However, this management tool is primarily designed to ensure sustainability of the exploited species rather than being focussed on sustaining the broad ecosystem services that are provided by a biogenic habitat like *Macrocystis*. As such, the proponents of Network 1 consider that a harvest ban is required to protect the biodiversity associated with *Macrocystis* in the most significant kelp forest habitats in the Forum region.

Site T1 is shown in Figure 2-61.

2.4.14.2 WHY THIS SITE HAS BEEN RECOMMENDED

Offshore and fringing kelp forests in the area from Warrington to Kakanui are nationally and globally significant. These kelp forest ecosystems are formed by *Macrocystis pyrifera* (giant or bladder kelp). A significant body of research has demonstrated that *Macrocystis* is an ecosystem engineer that shapes the community composition through the entrainment of larvae and spores, providing a three-dimensional habitat for a diverse range of species.

Research has also shown that *Macrocystis* canopies dampen waves, potentially reducing coastal erosion, and provide a buffer to reef systems from processes such as ocean acidification (by absorbing carbon dioxide and raising the seawater pH).

Kelp has been demonstrated to play a dominant role in the provision of energy to a broad range of coastal food webs. Energy from kelp forest photosynthesis supports the surrounding pelagic and benthic habitats, including soft-sediment habitats and offshore ecosystems (such as those in deep-water canyons). For example, recent research has shown that *Macrocystis* provides the majority of food for pāua on local rocky reefs.

The loss of stands of habitat-forming kelp from an area can result in profound changes in the food web structure and fishery productivity. For example, kelp habitat is critical for kōura papatea (rock lobster), enhancing the settlement of pelagic larvae and the survivorship of recently settled and juvenile individuals.

Testimony from commercial kōura papatea (rock lobster) fishers suggests that fisheries experience declines following events that remove kelp canopies. For example, the impacts of a flood in 1980 were still being felt in the local kōura papatea (rock lobster) fishery 5 years later.

The central role that *Macrocystis* plays in a range of ecological processes on temperate reefs and adjacent habitat means that the loss of these canopy-forming algae is likely to be associated with a significant loss of biodiversity and ecological function. *Macrocystis* kelp forests are in decline globally and similar kelp forests in south-eastern Australia have been listed as an Endangered Habitat type under the Environment Protection and Biodiversity



Figure 2-61: Site T1 - Kelp Forest overview map

Conservation Act 1999. Kelp forests have been lost from Tasmania’s east coast due to increasing sea surface temperatures and similar warming is occurring in the Forum region. Anecdotal evidence suggests that there has been a loss of kelp forest in the area that is being proposed for protection and further south (Takotā (The Nuggets) to Okaihae (Green Island)) in the last 50 years. This loss is most likely the result of increased sedimentation, but harvesting provides an additional and unwarranted risk to the values provided by *Macrocystis*, a species already threatened by other stressors.

Harvesting can impact directly on *Macrocystis* populations (e.g. by reducing reproductive output) and indirectly on the ecosystem services they provide. The latter is very important, because many coastal food webs and fisheries are supported by kelp forests and so the removal of kelp biomass via harvesting can have broad indirect impacts that are difficult to predict. For example, the loss of food for a local pāua fishery or a canopy that was important for kōura papatea (rock lobster) recruitment can cause major issues for valuable fisheries.

The recommended area includes the majority of the *Macrocystis* habitat within the Forum region. *Macrocystis* occurs to a depth of approximately 25 m, so the proposed boundary would ensure that the area protected included all potential *Macrocystis* habitat.

This proposal does not meet the protection standard as set out in the MPA Policy and therefore would not qualify as a Type 2 MPA. As such, it does not contribute to the overall network. However, it is referred to as an ‘Other Protection Tool’ within the MPA Policy as it does contribute to biodiversity and habitat protection.

2.4.14.3 WHAT SUBMITTERS SAID

The majority of submitters supported Site T as contained in the Consultation Document.

The Summary of Science Submissions showed that some submitters on the protection of the Kelp Forest provided statements in addition to the general support (i.e. the selection of ‘no opposition’ on the submission form). These statements widely reflected approval of policy that is applicable to habitat types of value and requested support for research into the historical extent of kelp beds prior to commercial exploitation. Of the statements, some submitters specifically used evidence and reasoning to support their claims. Submitters supported a ban on the commercial cutting of attached kelp, including canopy-harvesting methods, given their ecological roles and responses to pressures including sedimentation.

A commercial fisher who opposed Site T stated that evidence from research conducted at Banks Peninsula and other sources suggested that there was no evidence of an impact of harvesting on *Macrocystis* or the values it provides.

Table 2-37: Summary of submissions for Site T

Numbers of submitters in relation to the site showing the number of individual and proforma submissions.

Submission type	No. in support	No. in opposition	No. recommending a change
Pro forma	1822	0	139
Individual	262	27	19
Total	2084	27	158

2.4.14.4 ANALYSIS OF SITE T1

Table 2-38: Site T1 analysis – Meeting the Policy requirements

Site T1 Kelp Forest – Network 1	
Description	This area extends from Timaru breakwater to Pipikaretu Point and seaward 5.5 km (3 NM).
Relationship to Consultation Document	This proposal is unchanged from that included in the Consultation Document.
Recommended management tool(s) ¹⁹⁵ / protection standard	<ul style="list-style-type: none"> • ‘Other Protection Tool’. • No commercial harvesting of attached <i>Macrocystis</i> within the area described above. Cultural harvest not affected. • Network 1 proponents recommend that provision be made for incidental harvesting (bycatch) as part of other fishing operations.
Kāi Tahu cultural assessment	<p>Customary fisheries are located along the length of Site T1:</p> <p><i>South Canterbury</i></p> <ul style="list-style-type: none"> • From Timaru to Oamaru Harbour, customary values are principally located on gravel beaches and at river outlets. <p><i>North Otago</i></p> <ul style="list-style-type: none"> • From Ōamaru to Moeraki, rocky coastline, headlands and stretches of sandy beach support a range of customary fishery values. • Moeraki Harbour to Shag Mouth includes important rocky coastline, reefs and long stretches of beach that have strong customary fishery values. <p><i>East Otago</i></p> <ul style="list-style-type: none"> • Matakaea (Shag Point) to Matainaka includes a range of estuarine areas, rocky coastline and reef, as well as sand beaches, which are important for the customary fishery resource along this stretch of coast. • Matainaka to Waitati Inlet includes rocky coastline and reef, which are important for kaimoana, as well as the mouth of the Waikouaiti River and Bay. • Waitati to Purehurehu includes a number of important bays and estuary areas that have customary importance for the kaimoana and fishery. <p><i>Otago Harbour / Otago Peninsula</i></p> <ul style="list-style-type: none"> • Purehurehu to Pukekura (Taiaroa Head) crosses the mouth of the Otago Harbour. • Pukekura (Taiaroa Head) to Pipikaretu Point is an important coastal component of the Ōtākou Native Reserve, kaimoana and fishery.

¹⁹⁵ For further details on existing management tools in the Forum region, see Section 2.3.

Site T1 Kelp Forest – Network 1

Kāi Tahu cultural assessment continued

Fishery and kaimoana

There are various locations where the fishery and kaimoana resources are culturally important.

Māori land and reserves

- Māori Reserve lands on the Moeraki Peninsula.
- A fishing landing reserve at Karitāne in the Hawkesbury Lagoon.
- Māori land at Pukekura and at locations through to Pipkaretu Point.

Mātaitai reserves and taiāpure

- A freshwater mātaitai reserve over waterways associated with the Waihao River, Wainono Lagoon and their tributaries, located to the east of SH1 (gazetted 13 September 2012).
- Taiāpure from Cornish Head to Potato Point.
- A freshwater mātaitai reserve over the Waikouaiti River and estuary area.
- Mātaitai reserve over the lower Otago Harbour (gazetted 2016).

Kaitiakitaka

- The use of three species of rimurapa (bull kelp), to make poha (kelp bags) for preservation of kai or use in hangi still occurs.
- The customary use of kelp should be retained and available to whānau and hapū with an interest in exercising that customary right.
- Mātauraka associated with the management and use of kelp is an important taoka that requires continued access, use and sharing of knowledge.

Coastal mātaitai reserves are dependent on the retention of kelp forests (its protection allows the retention of that customary right).

Adverse impacts on existing users

Commercial fishing¹⁹⁶

The proposed restriction would affect six quota holders, none of whom currently harvest in the proposed area. There is currently little, if any, attached *Macrocystis* harvesting in the Forum region; most harvesting is of free-floating or beach-cast kelp.

Commercial quota holders would lose the opportunity to develop the fishery for *Macrocystis* within the protected area. This could reduce the value of the *Macrocystis* quota they hold.

Other areas outside the Forum region remain available to the quota holders. The total allowable commercial catch for attached giant bladder kelp in the relevant quota management area is significantly under-caught.

Recreational fishing

- Kelp forest protection is generally supported by recreational fishers.

¹⁹⁶ All fisher counts relate to the total number of permit holders thought to be active at each site over the 9-year period from 2007 to 2016. Further explanation of the commercial fishing data and statistical areas is provided in Section 2.4.1.2 and Appendix A1.2.

Site T1 Kelp Forest – Network 1

Other impacts

Accessibility

For enforcement and management:

- There are numerous access points to areas where giant bladder kelp flourishes, although the distances between them are great.

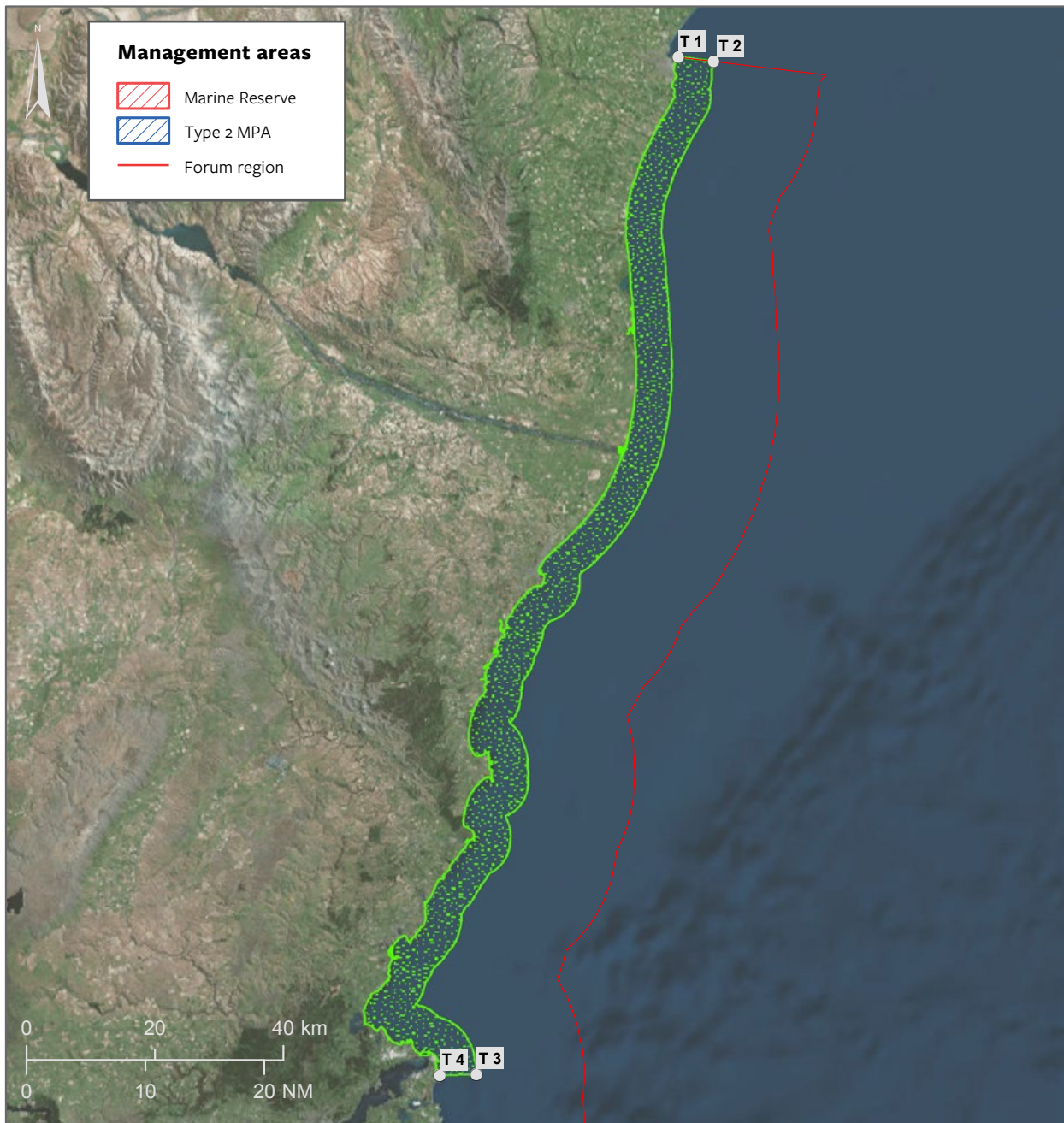
For the public:

- Members of the public encounter kelp forests at many places along the coast and admire their form when fronds strand on beaches.

Benefits

- Protection of an iconic ecosystem at the forefront of learning and ecology that forms the base of the coastal food web and creates habitat for other species.
 - Provides a high proportion of food for pāua and a larval recruitment site for species such as kōura papatea (rock lobster), protecting and enhancing these fisheries.
 - Indirect benefits to tourism through the enhancement of food supplies for tourist iconic species.
 - Potential for boat-based tourism.
 - Mitigates coastal erosion and protects reefs from climate change.
-

Figure 2-62: Location map for Site T1 – Kelp Forest



Index to Boundary Points		
Vertices	Latitude	Longitude
T1	44° 23.259' S	171° 16.183' E
T2	44° 23.666' S	171° 20.331' E
T3	45° 48.411' S	170° 49.331' E
T4	45° 48.412' S	170° 44.911' E

Distance between vertices		
Vertices	Distance (m)	Distance (NM)
T1 - T2	5559	3.001
T2 - T3	179975	97.179
T3 - T4	5726	3.092
T4 - T1	270986	146.321



3. MANAGEMENT RECOMMENDATIONS

Mussels.
Photo: John Barkla

The Forum makes the following recommendations in relation to the future management of the MPAs within the network(s).

3.1 GENERATIONAL REVIEW

The Forum recommends that there be a guaranteed 25-year generational review for all of the MPAs in the networks. This recommendation is an acknowledgement of the importance of each generation being engaged in a review of the effectiveness, performance and future direction of MPAs, and to enable adaptive management responses to monitored changes as well as the matters covered in Section 5. The Forum further recommends that any significant changes to the management regime or proposed boundaries as a result of any review should follow a similar process to that under which they were created, including consultation. The Forum also recommends that provision be made in the generational review for specific consideration of customary use for the purpose of retaining and exchanging of mātauraka (see Section 1.1.5).

There is consensus amongst the Forum members for a generational review of all MPAs. It is noted that this management tool was not specifically referred to in the Consultation Documents, but came through in the submissions.

3.2 CO-MANAGEMENT

The Forum recommends that any management structure for an MPA in the network provides for co-management by Kāi Tahu.¹⁹⁷ Co-management would enhance the retention and transfer of mātauraka between the generations, and maintain the connection to the rohe moana. This is a fundamental requirement for the support of Sites D1 and D2 by Kāti Huirapa Rūnanga ki Puketeraki, as noted in Section 2.4.5.

The Consultation Documents set out Kāti Huirapa Rūnanga ki Puketeraki objectives of managing any Marine Reserve, potentially using the taiāpure model. The position of Kāi Tahu with regards to each of the Networks is conditional on the generational review and co-management recommendations being implemented.

¹⁹⁷ Note: Co-management should not be confused with customary take.

3.3 MONITORING AND REVIEW

The Forum recommends that the management strategy includes a formal process to establish a baseline survey and subsequent monitoring programme that includes participation from government agencies, whānau, hapū and iwi, industry, the scientific community, conservation interests, and, if possible, recreational interests.

The Forum considers that appropriately designed, scientifically robust assessments for biodiversity and key species will be vital to the effectiveness of the MPA network in terms of meeting ecological objectives, and social and Kāi Tahu cultural expectations. The Forum also considers that a commitment to provide the data to independently assess each MPA and the MPA network is necessary to support effective co-management and generational reviews, and to enable adaptive management.

The Forum recommends that the monitoring programme should allow for:

- A robust generational review after 25 years. As part of this review, decisions can be made on boundary adjustments and changes to the rules within the MPA.
- Medium-term assessments of management measures (every 5 years) to identify actions that are required to address issues compromising the objective of the MPA and / or network (e.g. invasive species incursion).
- The inclusion of objectives to measure the ecological, Kāi Tahu cultural, social and economic effects of MPAs.

3.4 COMPLIANCE AND ENFORCEMENT

The Forum emphasises the importance of ongoing compliance as part of its recommendations to Ministers. Compliance and enforcement requirements and resourcing should be included within the management strategy if the MPAs are to be effective.

3.5 KŌIWI TĀKATA

Kōiwi tākata are defined as ‘unidentified human remains’ in the Ngāi Tahu ‘Koiwi Tangata (Human Remains) Policy, June 1993’ (the Koiwi Tangata Policy). This policy addresses human rights and fundamental freedoms concerning the management of unidentified skeletal remains of Māori that have been eroded from burial sites. Such burial sites are commonly found within the coastal marine area along the length of the coast within the Forum region, which is entirely within the takiwā of Kāi Tahu.

The Koiwi Tangata Policy expresses a clear preference for kōiwi tākata that are in situ to remain undisturbed and for the integrity of such burial sites to remain intact. However, Clause 2.10 of the policy states that the responsibility for the cultural care and eventual reburial of remains which are unearthed and identified as Māori rests with the local rūnaka.

The Forum notes that taoka or artefacts that are unearthed with kōiwi, or found separately within the coastal marine area, are subject to the jurisdiction of Heritage New Zealand, which administers the public process that determines ownership and custodianship.

It is the considered opinion of Kāi Tahu and the Forum that the retrieval of kōiwi tākata that are unearthed by natural or other means in an MPA is an exception to any rule or bylaw preventing the disturbance of an MPA. The Forum recommends that this is explicitly addressed during the establishment of any MPA.

3.6 CULTURAL MATERIALS

The Ngāi Tahu Cultural Materials Policy was instituted in 1994 to establish the interest of Kāi Tahu in the management of a range of cultural materials that were traditionally sought by Kāi Tahu tupuna (many of which are still sought today). This policy empowers kaitiaki rūnaka to negotiate with DOC for the implementation of durable protocols for accessing cultural materials, including stranded marine mammal remains. It also works alongside existing legislative provision for the customary use of traditional resources, the use and enhancement of cultural materials, and the transfer of mātauraka and traditional skills.

The Ngāi Tahu Cultural Materials Policy influenced the establishment of protocols with DOC for the retrieval of bone from stranded marine mammal remains. The use of such bone is made available to tribal artisans for the creation of taoka and artworks that celebrate and confirm the traditional connection with marine mammals. The Taonga Species section of the Ngāi Tahu Settlement Act 1998 (Section 296) provides for Kāi Tahu whānau and individuals possessing wildlife specimens. The Forum recognises that these protocols are now a common practice or courtesy exercised between DOC and manawhenua at the time of a marine mammal stranding, and recommends that provision for this important custom be included in the conditions for any MPA.

3.7 TRANSIT THROUGH MPAS BY VESSELS

Some submitters and Forum members have expressed concerns about the impact of MPAs, particularly Marine Reserves, on the ability to transit their vessel through certain areas. Commercial fishers have highlighted that they use some areas that are part of the proposed MPAs, particularly in times of foul weather, for actions such as sheltering, or cleaning and sorting catch.

The Marine Reserves Act already allows for the transit sheltering and anchoring of any vessel through a Marine Reserve provided that no fishing gear is in the water. However, if further assurance is required to address these concerns, the Forum recommends that it be made explicit that vessels, including fishing vessels, are permitted to transit through all MPAs and shelter in them when necessary, even with catch on board. The Forum also recommends that this be subject to the proviso that no fishing gear is allowed in the water while a vessel is within a Marine Reserve.

Similarly, for Type 2 MPAs that prohibit certain methods (e.g. trawling), the Forum recommends that it be made clear that a vessel is permitted to transit through the MPA as long as its fishing gear is not in the water.

3.8 SEISMIC TESTING AND BOTTOM DISTURBANCE

The Forum acknowledges the concerns raised by the Petroleum Exploration and Production Association of New Zealand (PEPANZ) in its submission and presentation to the Forum. PEPANZ has asked for clarity regarding regulations and for the impacts of petroleum exploration on the environment to be considered according to their merits.

No petroleum prospecting or mining permits have been issued for any of the areas where MPAs have been proposed in the recommendations. However, exploration permits overlap three of the recommended MPAs:

- Site C1 – Type 2 MPA, includes approximately 1.2 km² of permit 52717.
- Site E1 – Type 2 MPA, includes approximately 12 km² of permit 38264.
- Site H1 – Marine Reserve, includes approximately 18 km² of permit 38264.

A number of closed block offers also overlap with Sites E1 and H1.¹⁹⁸ Block offers for 2018 had not been released at the time of writing.

The Forum recommends that bottom disturbance and seismic testing associated with any activity including petroleum or mineral exploration or extraction be prohibited.

¹⁹⁸ Information taken from the New Zealand Petroleum & Minerals web maps (<https://www.nzpam.govt.nz>).

4. GENERAL RECOMMENDATIONS



Long Beach.
Photo: John Barkla

A number of other issues and concerns were raised by Forum members and submitters on matters that may affect not only some of the MPA proposals, but also the coastal marine environment in general.

4.1 LAND-BASED IMPACTS ON THE COASTAL ENVIRONMENT

Land-based impacts are a significant issue for this bioregion, particularly for estuaries, embayments and kelp. Research is required to determine how sedimentation and discharges from land-based activities contribute to environmental decline, with a focus on the extent of the impacts on habitats and ecosystems, and how those impacts should be avoided. Discharges to water, be it an estuary or coastal waters, are regulated under the Resource Management Act 1991 (RMA). Regional councils are responsible for developing regional water plans and regional coastal plans that set rules to control such discharges.

Discharges include city or district councils' stormwater and waste-water discharges, and ocean outfalls from meat-processing works. These are known as point-source discharges, as opposed to non-point source discharges such as nutrient run-off from farmland or sediment from disturbed land. The latter are more difficult to measure, especially if they enter estuaries or the open sea.

Land use and land disturbance activities (such as forestry, farm development, cultivation and wintering of stock), which are controlled by territorial and regional councils, can also impact on the coastal marine receiving environment. Habitat health and biodiversity protection in MPAs will be affected by land uses that discharge sediment and contaminants to adjacent coastal waters.

The Forum recommends that the region's regional and district councils with jurisdiction over activities that could affect the coastal environment in the Forum region ensure that the necessary monitoring and integrated management of land use and land disturbance is carried out to actively address the issues of concern, and protect and safeguard the coastal habitats and ecosystems.

The Forum also recommends that central and local government undertake greater advocacy to protect and better manage marine habitats and ecosystems.

4.2 PROPOSALS FOR BEYOND THE 12 NM LIMIT / EXCLUSIVE ECONOMIC ZONE PLANNING

Most deep habitats in the Forum region extend beyond the 12 NM boundary, limiting the ability to follow the MPA Guidelines in regard to whole habitat protection, longitudinal representation and species ranges. The most significant types of such habitats in this region are canyons, deep gravels and deep sands.

Two highly significant regional habitat drivers, the Southland Current / Subantarctic Front and the continental shelf edge, also cross the 12 NM boundary of the Forum region. The Forum is limited in its ability to recommend MPAs that appropriately account for these cross-boundary influences.

The inshore fishing industry is only able to fish deep water habitats where they come within the 12 NM boundary due to operating vessel, and skipper restrictions, particularly based on tickets held and vessel surveys.

The Forum recommends that any MPA planning processes that are relevant to the area beyond 12 NM take these cross-boundary issues into account.

4.3 FISHERIES MANAGEMENT

A considerable number of recreationally-focused submitters commented that recreational fishing and / or biodiversity could be enhanced through a variety of methods that were beyond the scope of the Forum. The most common suggestion called for a reduction in recreational daily catch limits, which is consistent with concerns that have been expressed over several decades. Many submitters felt that the current rawaru (blue cod) catch limit (30 fish per person per day) was too high. Submitters also noted that the recreational combined finfish, pāua and kōura papatea (rock lobster) limits were also too high and / or that the minimum recreational size of species allowable should be increased, particularly for rawaru (blue cod).

Other comments made by recreationally-focused submitters that were beyond the scope of the Forum's Terms of Reference included introducing a licensing system for recreational fishers, bringing charter fishing operations into the Quota Management System, the temporal and / or seasonal closures of sites, and the creation of recreational fishing parks. The Forum did not address alterations to the bag and / or size limits for recreational fishing, but noted that if the recreational sector would like to see these management measures changed, they should approach MPI.

The Forum notes that MPI is currently developing a national strategy for rawaru (blue cod) management with stakeholders. MPI has a dedicated recreational fishing team as part of its Recreational Fishing Initiative, which aims to engage with stakeholders to identify key issues. In principle, the Forum agrees that the management of recreational fishing take needs to be reviewed and recommends that MPI and the Minister of Fisheries take note of the recreational fishing concerns raised in submissions made to the Forum.

4.4 MĀORI NAMING PROPOSALS FOR MPA SITES

In response to the Forum decision to utilise Māori names for each of the proposed sites, Kāi Tahu have provided the following Māori placeholder names for the sites that are included in both Network 1 and Network 2:

- Sites A1 and A2 – Tuhawaiki: the name of a prominent reef and the point after which the mātaihai reserve is named; it is adjacent to the northeast boundary of Sites B1 and B2
- Sites B1 and B2 – Waitaki: after the prominent Waitaki River
- Site C1 – Moko-tere-a-torehu: a rock in the sea off the mouth of the Waitaki River that was named after a male crew member of the waka Arai-te-uru who was washed overboard
- Sites D1 and D2 – Te Umu Koau (note: this is the name for Bobby’s Head and so there is the need for further consultation with Kāti Rūnanga ki Puketeraki to establish a site name that would better reflect the Pleasant River to Stony Creek area)
- Sites E1 and G2 – Kaimata: the traditional name for the point known as Cape Saunders
- Site H1 and H2 – Papanui: this is to be utilised for the canyon over which Site H is proposed; it is the name of the bay at the east side of Cape Saunders
- Site I1 – Ōrau: the traditional name of Sandfly Bay and the site of an old nohoaka (encampment)
- Site K1 – Okaihae: the traditional name for Green Island
- Site L1 – Whakatorea (estuary): the name given to the hapua (estuary) after the tōrea (pied oystercatcher) that is found there
- Site M1 – Hākinikini: the traditional name for Quoin Point, which is included in the Site M1 proposal
- Site Q1 – Tahakopa: the traditional Māori name for the estuary and river that discharges into Site Q1
- Site T1 – Arai Te Uru: given the lengthy coastal extent of Site T1, it is appropriate that the traditional name for the coastal marine area off Otago (Arai-te-uru) is used.

Kāi Tahu Forum members have received conditional support for the above names from the respective rūnaka with manawhenua for the coastal marine areas covered by the proposed sites. The Forum recommends that the Ministers consult further with the relevant rūnaka once the sites have been selected by the Government for inclusion in their network of MPAs to confirm the Māori names. For clarity on which rūnaka holds manawhenua for each part of the coast, please refer to Section 1.1.10 – ‘Kāi Tahu takiwā’.

5.

UNIVERSAL ISSUES



Fishing boat.
Photo: Stephen Jaquiere

A number of issues arose during deliberations that fundamentally affected the ability of Forum members to move further towards a higher degree of consensus. The Forum considered it important to highlight some of these matters, but agreed that it was not productive to make recommendations on these matters and did not attempt to agree on recommendations. Thus, the matters covered in this section are not recommendations, but rather are included to provide decision makers with information that will help them to understand the wider context and levels of concern when evaluating future marine protection and fisheries management review processes.

5.1 DISPLACEMENT / REBALANCING

The impact of displacement on commercial fishing and the inability to accurately predict that impact was one of the matters that was an impediment to a higher level of consensus. The Forum did not reach a consensus on whether rebalancing or compensation would be necessary or appropriate.

The magnitude of this impact will vary depending on the ability of fishers to catch fish elsewhere and / or use other methods, and whether the annual catch entitlement level is available or achievable. In some instances, a different annual catch entitlement mix may be required as fish populations can be spatially variable. For example, there will be a greater displacement effect on pāua fishers (comparatively localised) than on fishers of some finfish species such as tarakihi or hoka (red cod) that can sometimes be caught elsewhere. There are, however, a number of species that also have very localised aggregations, such as mako (school shark and rig), mako repe (elephant fish), pātiki (flatfish) and kōura papatea (rock lobster). Catch intensity mapping by species, rather than by a single fishing method, shows areas where a number of key species are caught and that some are caught almost exclusively in specific areas, indicating that displacement is likely to have a higher impact on commercial fishing for these species.

Some of the Forum members believe that the potential impact of some spatial closures may affect not only the livelihoods of fishers operating in the area, but also the wider community that utilises the catch or provides services to the sector. Any transfer of effort may result in lower returns through either additional transit costs or lower catch per unit effort, and a reduction in catch from a spatial closure may also have secondary impacts on those who process fish or provide services to the sector. Such impacts are not factored into any analysis by MPI of the potential impact of a closure.

Partly due to the uncertainty around catch statistics and associated financial impacts, agreement could also not be reached on the effect that spatial closure and a subsequent shift in effort may have on the surrounding area. For fisheries that are not localised, the effect of a shift in effort and potentially more intense effort on the biodiversity of the remaining South Island East coast region could not be determined or agreed upon. For sedentary species such as pāua, the displacement of fishers and increased effort on the remaining stocks could have a negative impact on the sustainability of that species at the remaining open sites if it is subsequently overfished. On the other hand, a Marine Reserve may benefit a fishery through

enhanced big-fish breeding and nursery effects and consequent spillover, as has been recently proven for the Hauraki Gulf karatai (snapper (*Pagrus auratus*)) fishery.

The commercial fishing representatives are of the view that continued cumulative impacts of spatial closures will increase the risk to the wider East Coast region and to quota shares for existing quota owners.

The Forum was advised it could not consider compensation as part of its recommendations. Some Forum members consider it would help MPA planning if there was an option to rebalance the impact of new MPAs by adjusting catch limits and compensating fishers for any reductions in quota that resulted. For the commercial and Kāi Tahu representatives, the absence of a compensation option impeded a higher level of consensus.

From a Kāi Tahu perspective, the impact and redirection of fishing effort by commercial and recreational fishers into existing taiāpure and mātaītai reserves will likely be an issue that will arise from the establishment of Marine Reserves.

The proponents of Network 2 consider that rebalancing should be a two-step process that entails:

- A fisheries management response to remove the displaced catch from the fishery and rebalance the biological system. In the case of displaced commercial catch, the management response is likely to be a reduction in the total allowable commercial catch, whereas for displaced recreational catch, other management measures may be necessary to reduce catch (e.g. daily bag limit reductions); and
- A market-based response to rebalance economic incentives for the effective operation of the Quota Management System by ensuring that affected quota owners are no worse off (i.e. the Crown compensates affected quota owners for the market value of quota shares that are equivalent to the foregone commercial catch).

It is the opinion of some Forum members that, in the absence of rebalancing, the MPA network will have an overall negative effect on sustainable marine management, particularly if cumulative displacement from the network is significant.

5.2 SPILLOVER

Some Forum members consider that spillover from Marine Reserves has the potential to mitigate any potential adverse effects caused by the displacement of fishing effort within a Marine Reserve where populations of large, reproductive animals are protected. It is acknowledged that there is uncertainty in the scientific literature around the potential for this to occur within the Forum region. However, a recent study that measured the contribution of snapper larvae from the Leigh Marine Reserve to the Hauraki Gulf found that adult snapper within the reserve contributed approximately 11% of the juvenile population across an area that was 100 times that of the reserve, thus contributing to a snapper fishery located up to 40 km away which, in the researchers' view, more than compensated for the loss to

the fishery associated with the closure.¹⁹⁹ These results demonstrate that temperate MPAs have the potential to provide recruitment subsidies at magnitudes and spatial scales that are relevant to fisheries management. Furthermore, this study highlights the importance of adequate monitoring both to undertake meaningful future reviews of the network, and to further our knowledge of the potential benefits and costs that are associated with MPAs.

As with the issue of rebalancing above, there was no agreement amongst the Forum members as to the likelihood of potential benefits from spillover.

5.3 DIFFERENT THRESHOLDS FOR CUSTOMARY TOOLS VERSUS MPAS

Before declaring an area a mātaītai reserve, the Minister of Fisheries must, inter alia, consider the effects of the proposed reserve on existing fishers. Specifically, he or she must be satisfied that establishing a mātaītai reserve will not:

- (i) Unreasonably affect the ability of the local community to take fish, aquatic life, or seaweed for non-commercial purposes; or
- (ii) Prevent persons with a commercial interest in a species from taking their quota entitlement or annual catch entitlement (where applicable) within the quota management area for that species; or
- (iii) Prevent persons with a commercial fishing permit for a non-quota management species from taking fish, aquatic life or seaweed under their permit within the area for which that permit has been issued.²⁰⁰

The latter two considerations are referred to as ‘the prevent test’. If an application fails the prevent test, it must be declined.²⁰¹

By contrast, when considering an application for a Marine Reserve, the tests relating to impacts on fishing interests are whether the Marine Reserve will:

- (a) Interfere unduly with commercial fishing
- (b) Interfere unduly with or adversely affect any existing usage of the area for recreational purposes
- (c) Otherwise be contrary to the public interest.²⁰²

¹⁹⁹ Le Port, A.; Montgomery, J.C.; Smith, A.N.H.; Croucher, McLeod, I.M.; Lavery, S.D. 2017: Temperate marine protected area provides recruitment subsidies to local fisheries. *Proceedings of the Royal Society B – Biological Sciences* 284. <http://rspb.royalsocietypublishing.org/content/284/1865/20171300>.

²⁰⁰ Regulation 20(1)(e) of the Fisheries (South Island Customary Fishing) Regulations 1999 (the South Island Regulations).

²⁰¹ Regulation 20(2) of the South Island Regulations.

²⁰² Section 5(6) of the Marine Reserves Act 1971. The matters set out in this section are relevant to whether the Minister of Conservation upholds an objection to the Marine Reserve. Note: Via the concurrence process, the Minister of Fisheries will also consider these matters in regard to the establishment of a Marine Reserve.

To date, the mātaihai reserves in the Forum region have taken a significant amount of time to be approved (up to 10 years) and have had their size significantly reduced from the initial proposal due to these tests. Kāi Tahu believe that such inequitable standards unfairly disadvantage them in efforts to exercise their customary rights, puts a lower value on those rights than on the Crown's interest in establishing Marine Reserves and appears to be a breach of the Crown's duty of good faith as a Treaty partner.

Based on Kāi Tahu experience, the Forum concludes that it appears to be easier to declare an area a Marine Reserve than a mātaihai reserve, even though the actual impacts on existing users may be the same or greater for the Marine Reserve.

The East Otago Taiāpure Management Committee has managed the East Otago Taiāpure for two decades. Kāti Huirapa Rūnaka ki Puketeraki are concerned about the effect that a Marine Reserve may have within their rohe, and particularly within the taiāpure. The idea that any changes can be addressed by adjusting regulations within the taiāpure is flawed as it can take more than a year for regulations to be enacted. Therefore, this is considered a breach of the Crown's duty of good faith as a Treaty partner and undermines the rakatirataka of Kāti Huirapa Rūnaka ki Puketeraki. It is of significance that Kāti Huirapa Rūnaka ki Puketeraki do not oppose the establishment of a Marine Reserve within their rohe. However, effort must be made to ensure that co-management is enshrined in the establishment process and that the the East Otago Taiāpure Management Committee is able to respond appropriately.

5.4 IMPACTS OF MPAS ON FUTURE MĀTAITAI RESERVE APPLICATIONS

The establishment of MPAs reduces the area in which fishers can fish, increasing the likelihood that an application for a new mātaihai reserve will fail the prevent test and be declined,²⁰³ and thus reducing the opportunities for Kāi Tahu whānui to exercise their customary and Treaty settlement rights within their rohe.

This has been a significant negative factor that has impacted on the willingness of Kāi Tahu rūnaka to agree to the establishment of MPAs in their rohe – indeed, in some cases, it has resulted in outright opposition to proposals, especially regarding areas where rūnaka still hold aspirations for mātaihai reserves.

²⁰³ A mātaihai reserve may also not be declared if an area is already a Marine Reserve (see regulation 20(1)(f) of the South Island Regulations).

5.5 THE DISPUTED VALUE OF MARINE RESERVES

One difficulty the Forum faced was the lack of a common shared view of the need for Marine Reserves. Some Forum members did not accept that Marine Reserves would necessarily be beneficial to the protection of biodiversity and argued that biodiversity could be better protected through better management of threats rather than spatial closures.

6.

BROADER ISSUES

Diving, Aramoana.
Photo: Ross Funnell



6.1 MARINE AND COASTAL AREA (TAKUTAI MOANA) ACT 2011

In the Forum region, there are currently at least three applications for the recognition of either customary marine title or protected customary rights under the Marine and Coastal Area (Takutai Moana) Act 2011. Given the number of such applications across New Zealand (approximately 330), these applications will require considerable time and resources to resolve.

The Forum considers that these applications should not impede this MPA recommendation process, as there will be further consultation by the relevant Ministers before any MPAs are established. The Forum expects that the relevant Ministers will consider any customary title or rights claim prior to their final decision making.

6.2 TOURISM

MPAs can create both direct and indirect benefits for tourism. Direct benefits result from Marine Reserves attracting an increased number of visitors who wish to experience an unexploited marine environment, while indirect benefits occur as a result of the protection of charismatic marine species. There can also be benefits for tourism operators that currently run wildlife viewing ventures or for future potential operations.

Generally, positive effects may include increased visitor numbers, longer lengths of stay by visitors, and the attraction of visitors who are motivated by an interest in viewing and learning about the marine environment. This may also lead to more economic opportunities and environmental awareness. The natural environment on which much of the tourism in the region is based (marine wildlife) should be maintained and enhanced by MPAs. However, it is acknowledged that MPAs alone will not address the issues facing iconic species such as penguins.

This increased tourism can also potentially have negative effects. Where tourism operators offer charter fishing, they can have a detrimental impact on fish and shellfish stocks. Other negative effects may include excessive pressure on visitor infrastructure (e.g. toilets, roads, pathways) and the degradation or disturbance of nearby natural features (e.g. vegetation, soil, wildlife). This can lead to increased protection and compliance costs.

The Forum recommends that the potential negative effects be addressed through investment in infrastructure, enforcement and education.

6.3 LOCAL ENVIRONMENTAL CHANGE DRIVEN BY GLOBAL PROCESSES

Ocean warming, ocean acidification and sea level rise have already been demonstrated to be occurring within the Forum region. It is predicted that these changes, which are driven by global processes, will continue and intensify over the next 100 years. In particular:

- Sea surface temperatures are increasing. Data show that there has been an increase of approximately 0.11°C per decade or 0.67°C over the past 61 years (1953–2014) in the Otago Harbour (Nick Shears, University of Auckland, pers. comm. 2016), and models predict an increase of up to a 4°C over the next 100 years in some locations in New Zealand.²⁰⁴
- Increasing carbon dioxide in the atmosphere is being absorbed by seawater at the ocean's surface, making it more acidic.²⁰⁵ Ten years of monthly monitoring has shown a significant decrease in the pH of the waters off Otago, most likely due to global ocean acidification.
- The global average sea level has risen by approximately 20 cm since the beginning of the 20th century and local seas are rising at a similar rate to the global average. It has been predicted that the sea level will rise by 30 cm to 1 m over the next 80–100 years (Parliamentary Commissioner for the Environment 2015).²⁰⁶
- Large-scale changes in wind fields and storm frequency are predicted, which will affect ocean currents and vertical mixing.²⁰⁷

These changes are complex and do not occur in isolation. Furthermore, the broader impacts of a changing ocean climate can also interact with local stressors. The removal of other stressors such as fishing-related impacts can help reduce the impacts of globally-driven changes. For example, since kelp canopies provide a buffer against lower pH, the removal of a kelp canopy will increase the likely impact of ocean acidification on sensitive temperate reef organisms.

These global issues obviously cannot be addressed in this report or through the establishment of any one MPA. However, the protection of biodiversity and biogenic habitats through appropriately designed MPAs has the potential to mitigate the impacts of globally-driven changes by enhancing the resilience, and genetic and functional diversity of the local marine environment.

²⁰⁴ Boyd, P.W.; Law, C.S. 2011: An ocean climate change atlas for New Zealand waters: a primer for a major new web-based tool to help predict how oceanic species will be affected by climate change. NIWA Information Series No. 79. ISSN 1174-264X. 20 p.

²⁰⁵ Law, C.S. et al. 2017: Ocean acidification in New Zealand waters: trends and impacts. *New Zealand Journal of Marine and Freshwater Research*. DOI: 10.1080/00288330.2017.1374983

²⁰⁶ Parliamentary Commissioner for the Environment 2015: Preparing New Zealand for rising seas: certainty and uncertainty. Parliamentary Commissioner for the Environment, Wellington. 92 p.

²⁰⁷ Boyd, P.W.; Law, C.S. 2011: An ocean climate change atlas for New Zealand waters: a primer for a major new web-based tool to help predict how oceanic species will be affected by climate change. NIWA Information Series No. 79. ISSN 1174-264X. 20 p.

6.4 ADEQUACY OF CONSERVATION TARGETS

The aim of the New Zealand Biodiversity Strategy (2000) is to protect 10% of New Zealand's marine environment by creating a network of representative protected areas by 2010, in accordance with the targets set by the Convention on Biological Diversity²⁰⁸. The Forum's Terms of Reference requires that consideration be given to both the Biodiversity Strategy (2000) and the Convention on Biological Diversity.

A significant number of submissions from the public and the science sector recommended that the Forum should protect more than the maximum proposed 5.2% of the Forum region in Marine Reserves (proposed in the Consultation Document) based on current recommendations from the International Union for the Conservation of Nature (IUCN) for effective protection of at least 30% of the ocean.²⁰⁹ Submitters drew attention to the outcomes of the World Parks Congress in 2014 and the IUCN Congress in 2016, which considered that the 10% target was insufficient to protect biodiversity, preserve ecosystem services and achieve socioeconomic priorities, and called for 30% of marine space to be protected in non-extractive protected areas by 2030.²¹⁰

6.5 RISKS TO SEABIRDS

Seabirds are ranked as the world's most threatened group of birds, with nearly half of all species in known or suspected decline, and New Zealand has the highest number and proportion of threatened seabird species (more than double) of any country in the world.²¹¹ Seabird populations are vulnerable to decline due to their typically small breeding populations, low fecundity, long life spans, and restricted numbers and ranges of breeding sites.²¹²

Seabirds face threats both at their breeding sites and at sea. Terrestrial threats include predation by introduced mammals, loss of breeding habitat and human disturbance. Marine threats include pollution, fisheries bycatch and resource competition, toxic algal poisoning and disease, environmental variability, and global climate change.

Habitat loss, disease, pollution and fishing are known threats to penguins, for which the Forum region is of particular significance. The priority actions for protecting seabirds involve the removal of terrestrial predators, the protection of habitats, the minimisation of plastic pollution and the reduction of bycatch to negligible levels. An additional threat to penguins

²⁰⁸ www.cbd.int/sp/targets/rationale/target-11

²⁰⁹ IUCN, motion 53, 2016. <https://portals.iucn.org/congress/motion/053>

²¹⁰ <https://portals.iucn.org/congress/motion/053>

²¹¹ Croxall, J.P.; Butchart, S.H.M.; Lascelles, B.; Stattersfield, A.J.; Sullivan, B.; Symes, A.; Taylor, P. 2012: Seabird conservation status, threats and priority actions: a global assessment. *Bird Conservation International* 22: 1–34.

²¹² *Ibid.*

may be related to fluctuations in prey abundance, but further research is required to determine its relevance.

The establishment of formal and effective breeding and feeding site protection as part of national, regional and global networks of MPAs has been recommended for the recovery of seabirds.²¹³ The Forum region is significant for iconic penguin and toroa (albatross) species.²¹⁴ While many threats to these species cannot be mitigated through the establishment of MPAs, some threats can be addressed. For example, the maintenance of biodiversity and ecosystem functioning, which can be achieved through MPAs, would likely benefit not only seabirds but all large predators, such as rāpoka (New Zealand sea lion), pahu (Hector's dolphin) and paikea (whales), in the marine environment. This is discussed in more detail in the relevant site summaries for Network 1 in Section 2.4.

6.6 LIMITATIONS TO THE BEST AVAILABLE INFORMATION

6.6.1 Issues with the habitat classification and fisheries data

The habitat maps that were used in the MPA planning within the Forum region were derived from a national-scale classification that has been modelled based on the best available information. Concerns around the accuracy of the habitat information have been raised throughout the process, with contentions that some noted habitats do not exist in the claimed locale or, alternatively, that habitats exist that have not been mapped. The current 'broad brush' approach to the habitat classification clearly creates a backdrop where some habitats are over represented while others are underrepresented.

MPI has provided estimates of catches within the proposed sites. Actual losses as result of establishing an MPA will depend on a number of variables, including whether catch can be taken elsewhere and whether any additional costs are incurred in doing so. The models MPI uses make certain assumptions around where catch is actually taken – which could result in both over and underestimates of the affected catch. However, when assessing these effects, MPI does not rely exclusively on these models but also takes other variables into account, with consultation with fishers being an important part of any assessment. Similarly, the Forum has also considered the knowledge of Forum members, submissions and information received during engagement with fishers as part of the Forum process in assessing the expected impact on fishers.

²¹³ Croxall, J.P.; Butchart, S.H.M.; Lascelles, B.; Stattersfield, A.J.; Sullivan, B.; Symes, A.; Taylor, P. 2012: Seabird conservation status, threats and priority actions: a global assessment. *Bird Conservation International* 22: 1–34.

²¹⁴ Ref to Schedule 97 / 98 NTCSA.

The impact of an MPA on trawling in particular is likely to extend beyond the area that is closed because of the distance that is required to shoot and retrieve gear.

In respect of potting, the habitats can only be used as a proxy to ascertain where potential fishing has been undertaken. This information is, however, enhanced by the local fishers' knowledge represented by Forum members and submissions.

The Forum would like Ministers to note that these discrepancies may alter the level of representation that is presented for some habitats. In addition, the discrepancies with the habitat information, together with the resolution of the fisheries data, result in uncertainty as to the level of catch from specific areas, affecting the ability to accurately predict impacts on current users and conservation outcomes.

Please refer to Appendix 5 for further detail on the habitat classifications, including limitations, errors and inconsistencies, and Appendix A1.2 for details on the issues relating to the accuracy of commercial fishing information.

6.7 LEGISLATIVE REFORM

Government agencies have been consulting on proposed reforms of the MPA legislation. A new MPA Bill may be introduced to Parliament.

Since the new legislation had not been passed at the time of the Forum's deliberations, the Forum process continued under the existing legislation, including the Marine Reserve Act 1971 and a variety of other tools that are listed in the MPA Policy. This means that the Forum was not able to recommend new tools (such as recreational fishing parks, species-specific protection and seabed reserves) that are proposed to be included in the new Bill. However, from the outset of the Forum process, the Forum members have been aware that the primary implementation legislation may change, and consultation and recommendations were undertaken with that in mind.

7.

GLOSSARY



Juvenile hoiho (yellow-eyed penguins),
Tavora. Photo: John Barkla

7.1 ACRONYMS AND ABBREVIATIONS

AEBAR	Aquatic Environment and Biodiversity Annual Review ²¹⁵
DEM	Digital Elevation Model
DOC	Department of Conservation
EEZ	Exclusive Economic Zone
FMA	Fisheries Management Area
IBA	Important Bird Area
IUCN	International Union for the Conservation of Nature
LINZ	Land Information New Zealand
MACAA	Marine and Coastal Areas (Takutai Moana) Act 2011
MHWS	mean high water springs
MLWS	mean low water springs
MPA	Marine Protected Area
MPA Policy	Marine Protected Areas Policy ²¹⁶
MPA Guidelines	Marine Protected Areas Guidelines ²¹⁷
MPI	Ministry for Primary Industries
NIWA	National Institute of Water and Atmospheric Research
NM	nautical mile (1 NM = 1.8 km)
NTCSA	Ngāi Tahu Claims Settlement Act
PEPANZ	Petroleum Exploration and Production Association of New Zealand
QEII	QEII National Trust
RMA	Resource Management Act 1991
SH1	State Highway 1
SILNA	South Island Landless Native Act
TACC	Total Allowable Commercial Catch
the Forum	The South-East Marine Protection Forum – Te Roopu Manaaki ki te Toka
TRoNT	Te Rūnanga o Ngāi Tahu

²¹⁵ Ministry for Primary Industries. 2016. Aquatic Environment and Biodiversity Annual Review 2016. Compiled by the Fisheries Management Science Team, Ministry for Primary Industries, Wellington, New Zealand.

²¹⁶ This specifically refers to the publication: Department of Conservation; Ministry of Fisheries 2005: Marine Protected Areas: Policy and Implementation Plan. Wellington.

²¹⁷ This specifically refers to the publication: Ministry of Fisheries & Department of Conservation 2008: Marine Protected Areas Classification, Protection Standard and Implementation Guidelines.

7.2 TE REO

In the Kāi Tahu dialect, the ‘k’ and ‘ng’ in Māori words are used interchangeably. However, in this report, there is a preference for the use of the ‘k’ in all instances except where the words are in statute or are legislative terms (e.g. Te Rūnanga o Ngāi Tahu).

hapū	Extended family
hapūa	Estuary
Iwi	Tribe, people
kai hau kai	The custom of gathering whānau and hapū to celebrate and share mahika kai from across the rohe.
kaimoana	Seafood
Kāi Tahu	Tribal group of much of the South Island of New Zealand, sometimes referred to as Ngāi Tahu.
kaitiaki	Guardian
kaitiakitaka	The exercise of guardianship; in relation to fisheries resources, this includes the ethic of stewardship based on the nature of the resources, as exercised by the appropriate manawhenua in accordance with tikaka Māori (Fisheries Act 1996).
kōiwi tākata	Unidentified (Māori) human remains / skeletons.
mahika kai	Places where food and resources are procured and the practices of gathering such resources.
mana	Prestige, spiritual power
manaakitaka	Hospitality; this is a key cultural value as the ability to share kāi and appropriately host visitors at home or the marae is highly valued.
mana-moana	Customary authority or rakatirataka exercised by an iwi or hapū in an identified area over seas and lakes.
manawhenua	Customary authority or rakatirataka exercised by an iwi or hapū in an identified area.
mātaitai	Customary management areas that are one of the suite of management tools created under Part IX of the Fisheries Act 1996. These are designed to give effect to the obligations stated in the Treaty of Waitangi Fisheries Claims Settlement Act 1992 to develop policies that help recognise the use and management practices of Māori in exercising non-commercial fishing rights. Manawhenua may apply to establish a mātaitai reserve over a traditional fishing ground for the purpose of recognising and providing for customary management practices and food gathering. Traditional and recreational fishing are still allowed in mātaitai reserves.
mātauraka	The traditional knowledge accumulated by generations of Kāi Tahu whānau and hapū through co-existence with and the use and protection of their natural resources.
mātauraka Māori	Māori traditional knowledge
nohoaka	Temporary / seasonal campsite, encampment
papatipu	Traditional Māori land
Poatiri	Mt Charles – Otago Peninsula

rakatahi	Younger generation, youth
rakatirataka	Mana / authority
rohe	Area / region
rohe moana	Seascape
rūnaka	The governing council or administrative group of a Māori hapū or iwi.
taiāpure	Fisheries management tool used by iwi and hapū. A local area management tool established in an area that has customarily been of special significance to an iwi or hapū as a source of food or for spiritual or cultural reasons. ²¹⁸ Taiāpure can be established over an area of estuarine or coastal waters to make better provision for rakatirataka and for the rights secured under Article Two of the Treaty of Waitangi. Taiāpure provisions are contained within sections 174–185 of the Fisheries Act 1996. All fishing (including commercial fishing) can continue in a taiāpure, but this tool offers a way for manawhenua to become involved in the management of both commercial and non-commercial fishing in their area. Areas that are given special status to recognise rakatirataka (as taiāpure); management arrangements can be established (under the Fisheries Act 1996) for taiāpure that recognise the customary special significance of the area to iwi or hapū as a food source or for spiritual or cultural reasons.
Tākata Tiaki	Any person appointed as Tākata Tiaki under customary fisheries regulations, being a member of the manawhenua organisation or a notified representative.
takiwā	Traditional area of occupation of an hapū or iwi
taoka	Highly prized
Te Tai o Araiteuru	Southern coastal and sea area between the Waitaki and Waikawa Rivers.
tupuna	Ancestor
wāhi taōka	Places of special value
Waitaha	The first iwi to occupy southern Te Waipounamu who were followed by Kāti Māmoe and Kāi Tahu.
whānau	Family group; to be born, give birth
whānui	Extensive / the multitudes

²¹⁸ Fisheries Act 1996, section 174.

7.3 DEFINITIONS OF TERMS

Many of the following definitions have been taken from or based on definitions used in the New Zealand Biodiversity Strategy,²¹⁹ the MPA Guidelines²²⁰ and the Fisheries Act 1996.

artificial	Human-made structures that are placed in the marine environment for the purpose of human use (e.g. marinas, wharfs, marine farms), habitat enhancement or recreation.
annual catch entitlement	The right to catch a certain amount of a fish stock during a fishing year.
bedrock	Stable, hard substratum that is not separated into boulders or smaller-sediment units. These rock exposures typically consist of sedimentary rock benches or platforms, but may also include other rock exposures such as metamorphic or igneous outcrops. There may be varying degrees of concealment by attached plants and animal colonisation.
benthic	Dwelling on or associated with the seabed. Benthic organisms live on or in the seabed. Examples include burrowing clams, sea grasses, sea urchins and acorn barnacles.
benthic boundary layer	The dynamic environment at the interface between the deep water and the ocean floor.
biodiversity (biological diversity)	The variability among living organisms from all sources including, among other things, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems; and genetic (the variability in genetic make up among individuals of the same species), species and ecological diversity. In this report, the term refers specifically to indigenous biodiversity.
biogenic reefs	Elevated structures on the seabed that are constructed of living and dead organisms, including fragile, erect bryozoans and other sessile suspension feeders. Examples are bryozoan beds, rhodolith beds, tube worm mounds, sponge gardens and cold-water corals. These communities develop in a range of habitats from exposed open coasts to estuaries, marine inlets and deeper offshore habitats, and may be found in a variety of sediment types and salinity regimes.
biogenic habitat	Habitat created by the physical structure of living or dead organisms or by their interaction with the substrate. Biogenic habitats occur in a wide variety of environments, may be associated with hard (reef) or soft (sediment) substrates.
bioregion (biogeographic region)	An area that is defined according to patterns of ecological characteristics in the seascape.
coastal environment	An environment in which the coast is a significant element or part. The extent of the coastal environment will vary from place to place depending on how much it affects, or is affected by, coastal processes and the management issues concerned. It includes at least three distinct, but inter-related, parts: the coastal marine area, the active coastal zone and the land back-drop.
coastal marine	For the purposes of developing a network of protected areas, the MPA Policy specifies two planning processes – one for the coastal environment and one for the deep-water marine environment. For the purpose of implementing the network of protected areas, the coastal/ deep-water planning boundary is the limit of the territorial sea (12 NM).

²¹⁹ Department of Conservation; Ministry for the Environment 2000: The New Zealand Biodiversity Strategy. Department of Conservation and Ministry for the Environment, Wellington. 146 p. www.biodiversity.govt.nz

²²⁰ Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. Ministry of Fisheries and Department of Conservation, Wellington. 54 p.

comprehensiveness	The degree to which the full range of ecological communities and their biological diversity are incorporated within protected areas.
connectivity	The extent to which populations in different parts of a species' range are linked by the movement of eggs, larvae or other propagules, juveniles or adults.
continental shelf	A broad expanse of ocean bottom that slopes gently and seaward from the shoreline to the shelf-slope break. The shelf area is commonly subdivided into the inner continental shelf, mid-continental shelf and outer continental shelf. The sea floor below the continental shelf break is the continental slope. Below the slope is the continental rise, which finally merges into the deep ocean floor, the abyssal plain. The pelagic (water column) environment of the continental shelf constitutes the neritic zone. The continental shelf and slope are part of the continental margin.
continental slope	A steep-sloping bottom that extends seaward from the edge of the continental shelf and downward toward the rise. The continental slope is the relatively steep incline between the continental shelf and the surrounding ocean basin. In New Zealand, these slopes are typically inclined at an angle of 3–6°. The slope is often cut with submarine canyons.
Convention on Biological Diversity	An international agreement on biological diversity that came into force in December 1993. The objectives of the Convention are the conservation of biological diversity; the sustainable use of its components; and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.
demersal	Occurring near the seabed. Demersal organisms live near, but not on, the seabed and usually feed on benthic organisms.
ecosystem	An interacting system of living and non-living parts, such as sunlight, air, water, minerals and nutrients. Ecosystems encompass communities and their surrounding environments, and function through three basic cycles of matter and energy: biogeochemical cycles, life cycles and histories, and food webs. The 'interconnectedness' within and among ecosystems is provided by both the physical environment and biological interactions.
epipelagic zone	A zone that extends from the surface downward to as far as sunlight penetrates during the day. This very thin layer is up to approximately 200 m deep and is seaward of the shelf-slope break. The endemic species of this zone either do not migrate or perform only limited vertical migrations, although many animals enter the epipelagic zone from deeper layers during the night or spend their early development stages in the photic zone. The epipelagic zone overlies the mesopelagic zone.
estuarine	The estuarine environment includes estuaries, tidal reaches, the mouths of coastal rivers and coastal lagoons. The dominant functions are the mixing of freshwater and seawater, and tidal fluctuations, both of which vary depending on the degree of direct access to the sea. Estuaries are semi-enclosed bodies of water that have a free connection with the open sea. They differ from other coastal inlets in that sea water is measurably diluted by inputs of freshwater, which, combined with tidal movements, means that the salinity is constantly variable.
estuary	A partially enclosed coastal body of water that is either permanently or periodically open to the sea and within which there is a measurable variation in salinity due to the mixture of seawater and freshwater derived from land drainage.
Exclusive Economic Zone (EEZ)	The area of ocean from the outside edge of the territorial sea (which covers inland waters, harbours and the area out to 12 NM from the coast) out to 200 NM from the coast. The resources of New Zealand's EEZ are under New Zealand control.

exposure	<p>This is related to the prevailing energy of water movement, be it tidal, waves or currents. Wave exposure is determined by the aspect of the coast (which is related to the direction of the prevailing or strong winds), the fetch (the distance to the nearest land), openness (the degree of open water offshore) and profile (the depth profile of water adjacent to the coast). Three levels of relative exposure were used in the protected area coastal classification:</p> <ul style="list-style-type: none"> • High – areas with high wind/wave energy. This includes areas of open coast that face into the prevailing winds and receive oceanic swell (fetch >500 km, e.g. ocean swell environment; current >3 knots). • Medium – areas with medium wind/wave energy. This generally includes open coasts that face away from the prevailing winds and do not have a long fetch (fetch = 50–500 km, e.g. open bays and straits). • Low – areas with low wind/wave energy (fetch <50 km, e.g. sheltered areas, small bays and estuaries; current <3 knots).
fecund	Producing or capable of producing an abundance of offspring or new growth; highly fertile.
habitat	The place or type of area in which an organism naturally occurs.
hard bottom	Rocky reef and boulders
gifts and gains	A negotiating tool that was used during Forum deliberations whereby a particular stakeholder group may forego their particular interest in a particular site in acknowledgment of another group's opposition to it but in return gain support from that group for another site.
indigenous species	A plant or animal species that occurs naturally in New Zealand. Synonymous to 'native'.
interfluves	A narrow, elongated and plateau-like or ridge-like landform between two valleys.
intertidal	The area of land at the land–sea interface that is marine in character but influenced periodically by the rise and fall of twice-daily tides, bimonthly spring and neap tides, or ebb and flow in the tidal reaches of rivers.
invertebrate	An animal that lacks a backbone or spinal column. Insects, spiders, worms, slaters and many marine animals such as corals, sponges and jellyfish are examples of invertebrates. Invertebrates make up the vast majority of all animal species; only fish, amphibians, reptiles, birds and mammals are not invertebrates.
marine environment	Includes all areas in which the ocean and coast represent significant components, and all natural and biological resources contained therein. It includes the area from the Mean High Water Spring mark to the full extent of the EEZ (to 200 NM offshore). The 'marine environment' includes estuarine and near-shore coastal environments, as well as the continental shelf, seamounts and sea trenches.
Marine Protected Area (MPA)	An area that has been given a level of protection through a range of management tools that protect habitats and ecosystems. The MPA Guidelines ²²¹ prescribe three marine protection types, two of which provide enough protection to be considered MPAs. These marine protection types (Type 1 (Marine Reserve) and Type 2 (Other MPA)) are the only types of marine protection that meet the MPA protection standard, which sets the outcome irrespective of the management tool. This outcome is described in the MPA Policy as 'enabling the maintenance or recovery of the site's biological diversity at the habitat and ecosystem level to a healthy functioning state'.

²²¹ MPA Guidelines, p. 13.

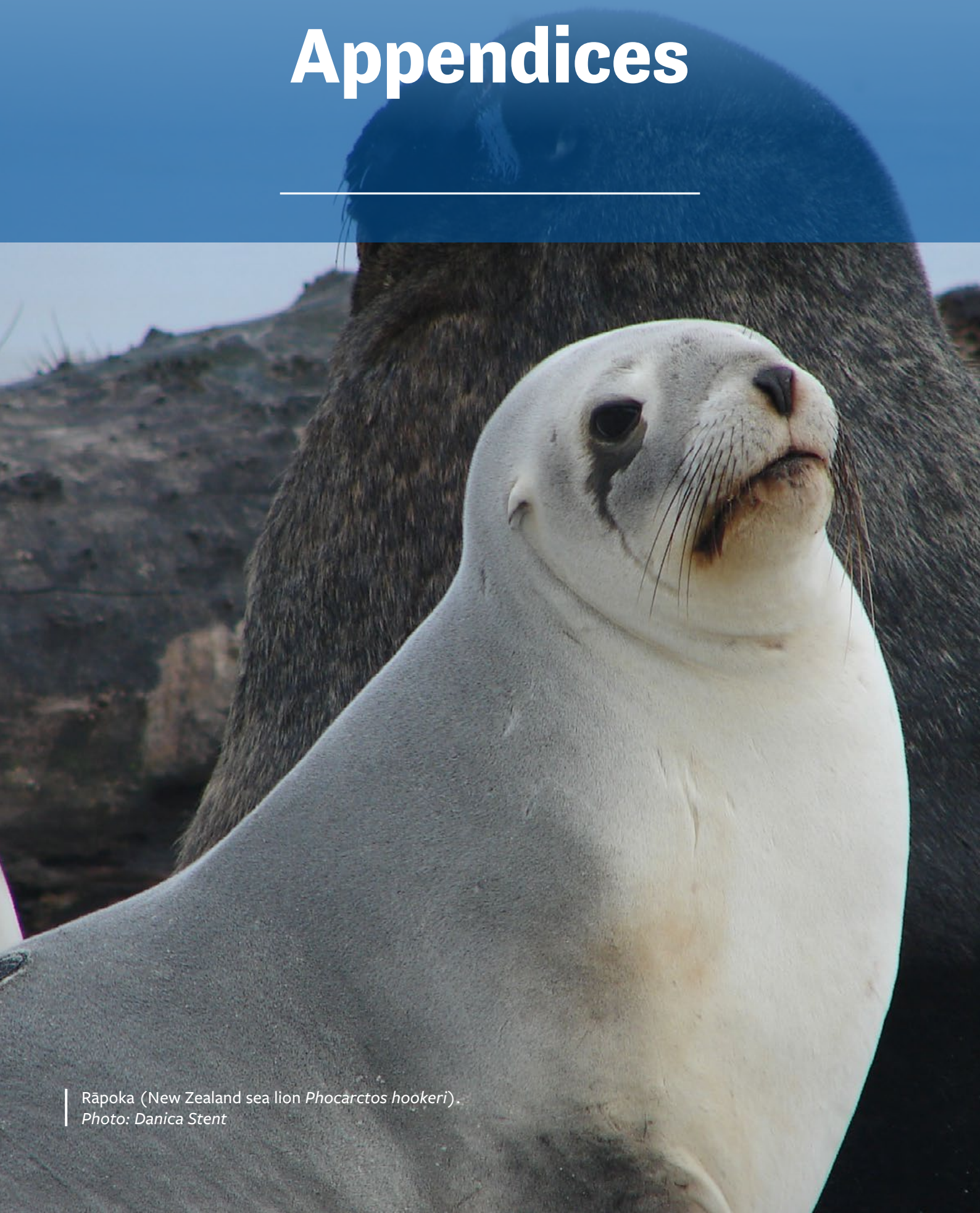
marine protection tools	<p>A range of management methods that can be used to establish a marine protected area. Other tools such as Hector's dolphins set net controls and protected land status (public conservation land), already exist in the Forum region and contribute to the protection and management of the marine environment. Other tools that are similar to those for marine protected areas (referred to as 'Type 3 tools' in the MPA Protection Standard) are relevant when measuring progress towards the Biodiversity Strategy target. However, only some tools qualify as MPAs for the purpose of the MPA Policy.</p> <p>Note: the consultation document also has a definition for 'management tools' which has been omitted in the recommendaiton report; it may be useful to insert it in the glossary before 'marine protection tools': Management tools are mechanisms that, directly or incidentally, establish a protected site and/or manage threats to the maintenance and/or recovery of the site's biodiversity at the habitat or ecosystem level. Direct management tools can therefore include marine reserves, fisheries restrictions, and mechanisms to reduce adverse impacts of land-based activities or shipping. Incidental management tools could include cable protection zones or marine mammal sanctuaries.</p>
Marine Reserve	A Type 1 MPA that is typically established under the Marine Reserves Act 1971 to give the highest possible level of protection for the purpose of preserving marine life for scientific study. Marine Reserves are generally no-take areas.
mean high water spring	The average of the levels of each pair of successive high waters, and of each pair of successive low waters, during that period of about 24 hours in each semi-lunation (approximately every 14 days), when the range of the tide is greatest (Spring Range).
megafauna	Large-bodied animals.
mesopelagic	The midwater or 'twilight' zone where there is still faint light but not enough for photosynthesis. This occurs at a depth of 200–1000 m, seaward of the shelf-slope break. Bacteria, salps, shrimp, jellyfish, swimming (cirrate) octopods, vampire and other squids, and fishes typically occur here, many of which are bioluminescent.
national park or reserve status	National parks and some types of reserves provide high levels of protection and could count towards the MPA network if they are of sufficient size and extend below the Mean High Water Spring. National parks and other conservation areas under the Reserves Act 1977 can include estuarine and intertidal areas.
neritic zone	The zone in the shallow part of the ocean.
network design principles	The principles that guide the design of the protected areas network. These include the concepts of representative, rarity/uniqueness, viability, replication, resilience and connectivity.
oceanic water column	Waters of the 'open ocean' that occur beyond the shelf break (approximately 200–250 m depth) and extend to the maximum ocean depths.
pelagic	Associated with open water. Pelagic organisms live in the open sea, away from the seabed.
pro forma	A term that is used to describe submissions that were completed by submitters using a template response that had been drafted by an organisation or individual for use by others.
protected area network	A network or system of protected areas. The principal criteria for New Zealand's protected area network are comprehensiveness and representativeness.
protection standard	The guidance for assessing whether a tool, or a combination of tools, provides sufficient protection for a site to provide for the maintenance and/or recovery of biological diversity at the habitat and ecosystem level to a healthy functioning state and is set out in the MPA Guidelines. The standard is described in Planning Principle 2 of the MPA Policy.

representativity	The Convention on Biological Diversity stated that ‘Representativity is captured in a network when it consists of areas representing the different biogeographical subdivisions of the global oceans and regional seas that reasonably reflect the full range of ecosystems, including the biotic and habitat diversity of those marine ecosystems’. ²²² To be included as ‘representative’, the habitat(s) within the site must be of sufficient extent and quality to enable the maintenance and/or recovery of biological diversity at the habitat and ecosystem level to a healthy functioning state.
resilience	The ability of a species, variety or breed to respond and adapt to external environmental stresses.
restoration	The active intervention and management of degraded biotic communities, physical features and seascapes in order to restore biological character, ecological and physical processes, and cultural and visual qualities.
salinity	The quantity of dissolved salts in water, particularly seawater and its diluted products. Salinity is recorded, by convention, as parts per thousand (‰); that is, grams of salts per litre of water. Water can be categorised as being fully saline (30–40‰), or as having variable salinity where the salinity fluctuates on a regular basis (18–40‰), reduced salinity (18–30‰) or low salinity (<18‰).
saltmarsh	An estuarine wetland in the intertidal zone that mainly has a mineral substrate.
seagrass	A vascular marine plant that has the same basic structure as terrestrial (land) plants. Seagrasses have tiny flowers and strap-like leaves, and form meadows in estuaries and shallow coastal waters with sandy or muddy bottoms. They are most closely related to lilies and so are quite different from seaweeds, which are algae. The leaves support an array of attached seaweeds and tiny filter-feeding animals such as bryozoans, sponges and hydroids, as well as the eggs of ascidians (sea squirts) and molluscs. They also provide food and shelter for juvenile and small fish.
soft bottom	A substrate with a small particle size and unstable bottom conditions (e.g. cobble, gravel, sand and mud bottoms).
species	A group of organisms that is capable of interbreeding freely with each other but not with members of other species.
statistical area	Areas into which New Zealand’s EEZ is divided for the purpose of commercial fisheries reporting.
submarine canyon	A valley on the seafloor of the continental slope. Submarine canyons are generally found as extensions to large rivers, and have been found to extend 1 km below sea level and extend for hundreds of kilometres. The walls are generally very steep and are subject to erosion by turbidity currents, bioerosion or slumping.
substrate	The type of bottom sediments, such as sand and gravel. Substrate type and sediment grain size have a strong influence on the types of plants and animals that can inhabit a given place, and range from tiny mud particles through to fine sand, coarse sand, pebbles, cobbles, boulders and solid rock outcrops.
subtidal	The zone in estuarine and coastal areas that occurs below the level of lowest tide. This zone is permanently inundated.
threatened species	A species that is vulnerable, endangered or presumed extinct. This report uses the New Zealand Threat Classification System (NZTCS) which lists New Zealand wild species according to its threat of extinction.
Type 2 MPA	An area that incorporates various management tools that together meet the protection standard. These management tools can be established under various Acts, but most notably the Fisheries Act 1996. Type 2 MPAs are not no-take MPAs, as they generally allow most recreational fishing to occur, as well as some commercial fishing depending on the fishing method used.

²²² www.cbd.int/decision/cop/?id=11663

upwelling	A process where subsurface, nutrient-rich and usually cooler water is carried upward into the ocean's surface layers. Upwelling is caused by a complex interaction between wind, currents and the topography of the sea floor.
viability	Size and quality of the MPA and whether that allows the MPA to meet the protection standard.
vertebrate	An animal with a backbone. This includes amphibians, reptiles, birds, mammals and fish.

Appendices



Rāpoka (New Zealand sea lion *Phocarctos hookeri*).
Photo: Danica Stent

APPENDIX 1: HABITAT AND FISHERIES DATA

A1.1 Habitat data

Table A1-1: Habitat data

Site-by-site habitat information for (A) Marine Reserves, and (B) Type 2 Marine Protected Areas. These data are based on the habitat classification provided in Marine Protected Areas Classification, Protection Standard and Implementation Guidelines, information on which, as well as limitations of the data, are provided in Appendix 5. Numbers refer to the area of each habitat that is contained within the site (km²), with the percentage of the regional habitat provided in brackets.

Habitat	Total habitat in region (km ²)	Site B1		Site B2		Site D1		Site D2		Site H1		Site H2		Site I1		Site K1		Site M1		Site O1	
		(km ²)	%	(km ²)	%	(km ²)	%	(km ²)	%	(km ²)	%	(km ²)	%	(km ²)	%	(km ²)	%	(km ²)	%	(km ²)	%
Deep Gravel	1102.15	0	0.0	0	0.0	0.10	0.0	0	0.0	20.89	1.9	5.22	0.5	0.74	0.1	0	0.0	0	0.0	0	0.0
Deep Mud	128.16	0	0.0	0	0.0	9.46	7.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Deep Reef	163.44	0	0.0	0	0.0	7.29	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Deep Sand	4785.77	0	0.0	0	0.0	37.65	0.8	0	0.0	128.82	2.7	82.92	1.7	7.06	0.1	1.56	0.0	0	0.0	58.25	1.2
Deep Water Sand	73.10	0	0.0	0	0.0	0	0.0	0	0.0	18.24	25.0	18.08	24.7	0	0.0	0	0.0	0	0.0	0	0.0
Exposed Boulder Beach	0.03	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.02	80.3	0	0.0	0	0.0	0	0.0
Exposed Intertidal Reef	7.21	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.45	6.2	0.03	0.4	0.60	8.4	0.42	5.8
Exposed Sandy Beach	6.34	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.57	9.0	0	0.0	0.04	0.6	0.24	3.8
Exposed Shallow Gravel	6.49	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.23	3.5	0	0.0	0	0.0	0	0.0
Exposed Shallow Reef	90.88	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2.44	2.7	0.20	0.2	2.66	2.9	4.03	4.4
Exposed Shallow Sand	547.14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17.18	3.1	3.16	0.6	2.53	0.5	12.42	2.3
Moderate Gravel Beach	3.24	0.43	13.2	0.43	13.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Moderate Intertidal Reef	5.23	0	0.0	0	0.0	0.19	3.6	0.19	3.6	0.19	3.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Moderate Sandy Beach	6.43	0	0.0	0	0.0	0.21	3.2	0.21	3.2	0.21	3.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Table AI-1 (A) continued

(A) Marine Reserves		Site B1	Site B2	Site D1	Site D2	Site H1	Site H2	Site I1	Site K1	Site M1	Site O1	
Habitat	Total habitat in region (km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	
		%	%	%	%	%	%	%	%	%	%	
Moderate Shallow Gravel	901.77	87.09	74.38	8.2	0	0.0	0	0.0	0	0.0	0	0.0
Moderate Shallow Mud	132.93	13.78	13.61	10.2	10.14	7.6	0	0.0	0	0.0	0	0.0
Moderate Shallow Reef	116.82	0	0	0.0	28.99	24.8	14.67	12.6	0	0.0	0	0.0
Moderate Shallow Sand	768.34	0	0	0.0	0.79	0.1	0.26	0.0	0	0.0	0	0.0
Sheltered Intertidal Reef	0.42	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Sheltered Sandy Beach	1.02	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Sheltered Shallow Reef	4.49	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Sheltered Shallow Sand	25.88	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine	9.04	0	0	0.0	0.29	3.3	0.00	0.0	0	0.0	0	0.0
Estuarine Boulder Beach	0.02	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Boulder Reef	0.00	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Cobble Beach	0.06	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Cobble Field	0.00	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Gravel Beach	0.33	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Gravel Field	0.43	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Intertidal Reef	0.82	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Mud Flat	42.59	0	0	0.0	0.67	1.6	0	0.0	0	0.0	0	0.0
Estuarine Reef	0.20	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Estuarine Sand Flat	20.67	0	0	0.0	0	0.0	0	0.0	0	0.02	0	0.0
Estuarine Sandy Beach	16.43	0	0	0.0	0.15	0.9	0.00	0.0	0	0.02	0	0.0
Biogenic - <i>Macrocystis</i>	18.00	0	0	0.0	5.9	32.8	5.8	32.2	0	0.0	0	0.0
Biogenic Seagrass	7.20	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Biogenic - Bryozoan Habitat	431.00	0	0	0.0	0	0.0	0	0.0	129	29.9	75	17.4

Table A1-1 (B) continued

(B) Type 2 Protected Areas		Site A1	Site A2	Site C1	Site E1	Site G2	Site L1	Site Q1
Habitat	Total habitat in region (km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)	(km ²)
		%	%	%	%	%	%	%
Estuarine	9.04	0	0	0	0	0	0.08	0.21
Estuarine Boulder Beach	0.02	0	0	0	0	0	0.00	0
Estuarine Boulder Reef	0.00	0	0	0	0	0	0.00	0
Estuarine Cobble Beach	0.06	0	0	0	0	0	0.00	0
Estuarine Cobble Field	0.00	0	0	0	0	0	0.00	0
Estuarine Gravel Beach	0.33	0	0	0.00	0	0	0.00	0
Estuarine Gravel Field	0.43	0	0	0.00	0	0	0.00	0
Estuarine Intertidal Reef	0.82	0	0	0	0	0	0.00	0
Estuarine Mud Flat	42.59	0	0	0	0	0	0.11	0.40
Estuarine Reef	0.20	0	0	0	0	0	0.00	0
Estuarine Sand Flat	20.67	0	0	0	0	0	0.04	0.01
Estuarine Sandy Beach	16.43	0	0	0	0	0	0.05	0.07
Biogenic - <i>Macrocystis</i>	18.00	0	0	0	0	0	0.00	0
Biogenic - Seagrass	7.20	0	0	0	0	0	0.00	0
Biogenic - Bryozoan Habitat	431.00	0	0	0	276	138	0.00	0
					64.0	32.0		

A1.2 Fisheries data

A1.2.1 OVERVIEW

The Ministry for Primary Industries (MPI) requires reporting of catch and method details of fishing events for all commercial fishing trips in the Exclusive Economic Zone (EEZ). Since October 2007, MPI has modelled the likely or possible space involved in all fishing events and mapped the aggregated average annual intensity of fishing or catch.

The detail that the spatial information supplied to MPI by commercial fishers varies, depending on the fishing methods they are using. Fishing methods like offshore trawling require the recording of both start and end points but other methods (like hand gathering) may only require a statistical area as a locational reference for a fishing event. Any point location supplied to MPI usually has an accuracy of approximately 1 NM (1.8 km).

A1.2.2 MAPPING OF FISHING EVENTS

- In the case of inshore trawling, the end position of a tow is estimated based on the location of the next trawl start position during that fishing trip. The trawl length was estimated using the fishing time and vessel speed reported by the fishers. The direction for the last trawl on a trip was assumed to be towards the landing port used on that trip.
- For other longline sets, the start position is buffered by a circle with a radius equivalent to the length of the line set. Set net fishing is mapped using 2 NM (3.6 km) buffered circles around the reported start position for each event.
- For all other fishing events, including set netting and longlining by vessels less than 6 m in length, which are not required to report their start positions, the location of fishing is reported using large statistical areas. Where possible, the likely location of each fishing event is constrained within the reported statistical area based on environmental data such as depth, topography, habitat type or narratives provided by the fishers. For example, rock lobster potting reported using a statistical area will be assigned to all subtidal rocky reef areas within each rock lobster statistical area, cod potting will be confined to all shallower areas within each general statistical area and pāua harvesting will be confined to all shallow rocky reefs within each pāua statistical area.

Table A1-2: Fisheries data limitations

Reported locations and assumptions made when mapping areas in which commercial fishing methods are used

Method	Required Reported Location	Applied area values	Estimated locations
Trawl (offshore)	Start and end points	Trawl doorspread width (specific to different fisheries)	N/A
Trawl (inshore)	Start point	Trawl doorspread width (specific to different fisheries)	End points are estimated using the bearing to the start location of the next tow within the same trip. Trawl length is calculated using the reported time and speed values. Missing values are populated using medians from similar fisheries
Set Net (>6 m vessel length)	Start point	Buffered by 2 NM (3.6 km)	N/A
Longlining (>6 m vessel length)	Start point	Buffered using the reported line length	N/A
Jig	Location at midnight	Buffered by 5 NM (9.2 km)	N/A
Pāua	Statistical area	Rocky reef locations within the statistical areas	N/A
Pot (with coordinates)	Start point	Buffered by 1 NM (1.8 km)	N/A
Cray pot	Statistical area	Rocky reef locations within the statistical areas	N/A
Crab pot	Statistical area	Areas described by fishers within statistical areas	N/A
Pot (without coordinates)	Statistical area	Statistical areas reduced to certain depths in certain fisheries	N/A
All other fishing events	Statistical area	N/A	N/A

A1.2.3 FORUM REGION LAYERS

The reported commercial catch within the South-East Marine Protection Forum (the Forum) region between October 2007 and September 2013 was made available to the Forum during the proposal development stage. However, the information included in this recommendations report has been updated to include data to September 2016. All commercial catch data had been averaged to create annually averaged catch data.

The information provided to the Forum was in two parts:

1. Layers for display as map layers within the SeaSketch application
2. Layers used for analysis and reporting within SeaSketch by Forum members.

Display layers

The commercial fishing intensity layers that were visible within the SeaSketch application represented the average reported catch of all species within the Forum region over the 6 years of available information. The layers had a spatial resolution of 1 km² and had been separated by fishing gear type (Trawl = bottom and midwater trawl, Pot = cod, rock lobster and crab pots, etc.) as well as including a single layer that contained the total catch for all fishing methods combined.

Since these layers were intended for public viewing, there was a requirement to ensure that the activities of individual fishers were not identifiable. To maintain fisher confidentiality, a methodology was developed that identified areas where fewer than three permit holders were active. These areas were then merged with neighbouring areas that also contained fewer than three permit holders to form 2 km² grid cells. If three or more permit holders were present within the expanded area, the catch values were averaged across all values within the larger cell area. If the number of permit holders present within one of the increased cells was still fewer than three, the cell size was increased to 5 km² and so on up to 50 km² or until three or more permit holders were active within an area.

The map layers were then classified into a ten-class, high to low ranking system to allow the identification of areas with differing fishing intensity whilst removing the ability for users to extract catch estimate values from the data.

Analysis layers

The layers that were used within SeaSketch for reporting were based on the same base information as was used to create the display layers, but with two differences: these layers did not undergo the same anonymising process as the display map layers and the categories were broken down into individual fisheries rather than the broad-scale gear types that were used in the display maps.

The 'Fishery Displacement' category represented the percentage of fishery catch within an area of interest compared to the total catch for that fishery within the Forum region. For example, a fishery displacement value of 10% for a Marine Protected Area (MPA) option in the SeaSketch report indicated that 10% of that fishery within the Forum region was likely caught in that particular area and might move elsewhere if the commercial fishing restrictions provided by that MPA are enforced.

A1.2.4 NETWORK SUMMARIES

Site-by-site data

Table A1-3: Commercial fishery displacement – site-by-site data.²²³

Displacement relates to the amount of effort / catch that has occurred within the sites during the fishing years 2007/08 to 2015/16, that would be displaced by the proposals.²²⁴ Percentages are the proportion of displacement based on the Forum region (as opposed to the Quota Management Area). The table also shows the amount of catch that could be displaced in kg together with export value (\$), based on estimates provided by MPI. Export value is based on 2016 export prices.²²⁵ For some stocks, 2017-18 port price is used as a proxy. Where there are no export or port prices available, these stocks are not included in the calculations. The actual export value may therefore be slightly higher than the estimates included here.

Fishery	Site-A1			Site-A2		
	%	kg	\$	%	kg	\$
Danish seine	1.5	1,449	5,807	0.0	0	0
Dive - Pāua	N/A	N/A	N/A	N/A	N/A	N/A
Jig - Squid	N/A	N/A	N/A	N/A	N/A	N/A
Line ²²⁶	2.1	1,000	12,134	0.5	250	3,220
Net - Elephant fish	0.2	12	64	0.0	N/A	N/A
Net - Rig	<0.1	1	6	0.0	N/A	N/A
Net - School shark	<0.1	<1	1	0.0	N/A	N/A
Net - Other	0.0	0	0	0.0	N/A	N/A
Pot - Blue cod	N/A	N/A	N/A	N/A	N/A	N/A
Pot - Lobster	N/A	N/A	N/A	N/A	N/A	N/A
Trawl - Flatfish	1.8	15,035	80,515	0.1	966	5,088
Trawl - Gurnard	11.2	16,676	87,640	0.9	1,344	7,347
Trawl - Red cod	5.5	15,042	45,251	0.4	1,140	3,300
Trawl - Tarakihi	0.1	95	368	0.0	0	0
Trawl - Other	4.3	48,706	204,618	0.2	2,883	12,829
Total		98,017	436,405		6,583	31,785

²²³ There is insufficient data on which to assess displacement, volume or value for estuaries. This affects the estuarine part of Site D1, as well as Sites L1 and Q1.

²²⁴ SeaSketch report include 'Dive – Other'. The amounts involved are very small, but as very little 'Dive – Other' occurs in the Forum region, this shows as a high percentage displacement. The figures are not included here because the Forum considers they give a false impression of a high impact.

²²⁵ In the body of this recommendations report, estimated export value and volume may differ slightly from these tables. This is because some methods, for example crab potting, are not included in SeaSketch reports, but have been included in MPI's calculations.

²²⁶ 'Line' includes bottom long line and dahn line.

Fishery	Site-B1			Site-B2		
	%	kg	\$	%	kg	\$
Danish seine	2.4	2,541	10,207	1.8	1,755	7,054
Dive - Pāua	0.0	0	0	0.0	0	0
Jig - Squid	0.0	0	0	0.0	0	0
Line	0.5	182	936	0.5	174	904
Net - Elephant fish	0.1	22	121	0.0	0	0
Net - Rig	0.1	30	172	0.0	0	0
Net - School shark	0.1	16	84	0.1	<1	<1
Net - Other	0.1	6	40	0.0	0	0
Pot - Blue cod	<0.1	0	4	0.0	0	4
Pot - Lobster	0.0	0	0	0.0	0	0
Trawl - Flatfish	<0.1	4	25	0.0	0	2
Trawl - Gurnard	0.0	0	0	0.0	0	0
Trawl - Red cod	<0.1	34	95	<0.1	18	52
Trawl - Tarakihi	0.3	365	1,506	0.3	328	1,288
Trawl - Other	0.1	1,045	5,054	0.1	1,022	4,857
Total		4,247	18,244		3,299	14,161

Fishery	Site-C1		
	%	kg	\$
Danish seine	12.3	16,628	65,416
Dive - Pāua	N/A	N/A	N/A
Jig - Squid	N/A	N/A	N/A
Line	N/A	N/A	N/A
Net - Elephant fish	0.9	628	3,385
Net - Rig	2.6	3,111	17,190
Net - School shark	5.0	4,604	22,568
Net - Other	1.9	992	6,347
Pot - Blue cod	N/A	N/A	N/A
Pot - Lobster	N/A	N/A	N/A
Trawl - Flatfish	<0.1	48	229
Trawl - Gurnard	0.2	469	3,167
Trawl - Red cod	0.2	545	1,058
Trawl - Tarakihi	0.3	316	1,297
Trawl - Other	0.5	5,020	19,244
Total		32,359	139,901

Fishery	Site-D1			Site-D2		
	%	kg	\$	%	kg	\$
Danish seine	<0.1	22	85	0.0	0	0
Dive - Pāua	0.5	202	4,753	0.5	205	4,841
Jig - Squid	0.0	0	0	0.0	0	0
Line	2.0	1,125	12,862	0.8	529	6,088
Net - Elephant fish	0.2	145	885	0.0	0	0
Net - Rig	0.1	96	434	0.0	0	0
Net - School shark	<0.1	18	114	0.0	0	0
Net - Other	1.0	1,921	14,379	0.0	0	0
Pot - Blue cod	1.5	2,949	39,335	0.2	484	6,647
Pot - Lobster	15.5	20,569	2,246,754	5.8	9,772	1,067,947
Trawl - Flatfish	0.2	1,649	9,021	<0.1	71	377
Trawl - Gurnard	1.5	2,305	12,243	<0.1	35	198
Trawl - Red cod	0.1	366	1,752	<0.1	8	29
Trawl - Tarakihi	0.4	582	3,094	<0.1	11	66
Trawl - Other	0.7	8,425	35,515	<0.1	280	1,268
Total		40,373	2,381,227		11,394	1,087,460

Fishery	Site-E1			Site-G2		
	%	kg	\$	%	kg	\$
Danish seine	0.0	0	0	0.0	0	0
Dive - Pāua	N/A	N/A	N/A	N/A	N/A	N/A
Jig - Squid	N/A	N/A	N/A	N/A	N/A	N/A
Line	N/A	N/A	N/A	N/A	N/A	N/A
Net - Elephant fish	0.5	302	1,607	N/A	N/A	N/A
Net - Rig	2.1	2,338	12,096	N/A	N/A	N/A
Net - School shark	8.9	6,826	33,154	N/A	N/A	N/A
Net - Other	2.9	3,827	16,071	N/A	N/A	N/A
Pot - Blue cod	N/A	N/A	N/A	N/A	N/A	N/A
Pot - Lobster	N/A	N/A	N/A	N/A	N/A	N/A
Trawl - Flatfish	0.1	541	2,999	<0.1	112	646
Trawl - Gurnard	<0.1	45	269	<0.1	17	96
Trawl - Red cod	0.1	207	662	<0.1	58	138
Trawl - Tarakihi	0.6	581	3,015	0.1	173	894
Trawl - Other	0.2	1,709	5,980	<0.1	242	862
Total		16,377	75,852		603	2,634

Fishery	Site-H1			Site-H2		
	%	kg	\$	%	kg	\$
Danish seine	0.0	0	0	0.0	0	0
Dive - Pāua	0.0	0	0	0.0	0	0
Jig - Squid	3.3	8,204	25,351	2.1	5,396	16,675
Line	3.4	821	3,592	1.6	358	1,625
Net - Elephant fish	0.1	71	401	<0.1	15	81
Net - Rig	2.1	2,523	12,835	1.3	1,410	7,057
Net - School shark	1.7	1,480	7,229	0.7	641	2,953
Net - Other	1.9	1,766	8,243	1.0	791	3,424
Pot - Blue cod	2.4	4,849	59,347	1.4	2,998	35,543
Pot - Lobster	0.0	0	0	0.0	0	0
Trawl - Flatfish	<0.1	303	1,697	<0.1	253	1,430
Trawl - Gurnard	<0.1	37	215	<0.1	30	174
Trawl - Red cod	<0.1	54	126	<0.1	22	51
Trawl - Tarakihi	0.2	274	1,363	0.1	163	789
Trawl - Other	<0.1	1,200	5,065	<0.1	816	3,585
Total		21,583	125,465		12,895	73,387

Fishery	Site-I1		
	%	kg	\$
Danish seine	0.0	0	0
Dive - Pāua	<0.1	13	300
Jig - Squid	0.5	1,242	3,837
Line	0.5	122	1,325
Net - Elephant fish	0.0	0	0
Net - Rig	0.0	0	0
Net - School shark	0.0	0	0
Net - Other	0.0	0	0
Pot - Blue cod	0.5	865	11,595
Pot - Lobster	1.8	1,575	168,759
Trawl - Flatfish	<0.1	52	265
Trawl - Gurnard	<0.1	8	51
Trawl - Red cod	<0.1	72	281
Trawl - Tarakihi	0.1	144	749
Trawl - Other	<0.1	154	684
Total		4,247	187,844

	Site-K1		
Fishery	%	kg	\$
Danish seine	0.0	0	0
Dive - Pāua	0.0	0	0
Jig - Squid	0.0	0	0
Line	<0.1	2	16
Net - Elephant fish	0.0	0	0
Net - Rig	0.0	0	0
Net - School shark	0.0	0	0
Net - Other	0.0	0	0
Pot - Blue cod	0.1	141	1,961
Pot - Lobster	0.2	129	14,816
Trawl - Flatfish	<0.1	63	376
Trawl - Gurnard	<0.1	3	16
Trawl - Red cod	<0.1	15	63
Trawl - Tarakihi	<0.1	12	68
Trawl - Other	<0.1	56	293
Total		420	17,610

	Site-M1		
Fishery	%	kg	\$
Danish seine	0.0	0	0
Dive - Pāua	<0.1	17	406
Jig - Squid	0.0	0	0
Line	0.6	245	3,194
Net - Elephant fish	0.0	0	0
Net - Rig	0.0	0	0
Net - School shark	0.0	0	0
Net - Other	0.0	0	0
Pot - Blue cod	<0.1	29	490
Pot - Lobster	1.0	1,885	202,504
Trawl - Flatfish	0.3	2,639	16,655
Trawl - Gurnard	<0.1	2	11
Trawl - Red cod	0.1	186	551
Trawl - Tarakihi	0.0	0	0
Trawl - Other	<0.1	215	777
Total		5,218	224,589

Fishery	Site-01		
	%	kg	\$
Danish seine	0.0	0	0
Dive - Pāua	5.7	2,738	64,553
Jig - Squid	1.7	3,459	10,689
Line	1.1	233	3,038
Net - Elephant fish	0.0	0	0
Net - Rig	0.2	120	634
Net - School shark	0.5	438	2,211
Net - Other	0.1	6	17
Pot - Blue cod	0.3	393	6,516
Pot - Lobster	0.1	97	11,163
Trawl - Flatfish	6.6	43,883	265,346
Trawl - Gurnard	<0.1	11	73
Trawl - Red cod	1.9	4,891	15,754
Trawl - Tarakihi	0.8	1,396	6,886
Trawl - Other	0.4	5,494	23,987
Total		63,160	410,869

APPENDIX 2: MARINE PROTECTED AREAS PLANNING SUMMARY

A2.1 Policy overview

The South-East Marine Protection Forum's (the Forum's) network planning was guided by two main documents: the Marine Protected Areas Policy and Implementation Plan²²⁷ (the MPA Policy) and the Marine Protected Areas Classification, Protection Standard and Implementation Guidelines²²⁸ (the MPA Guidelines).

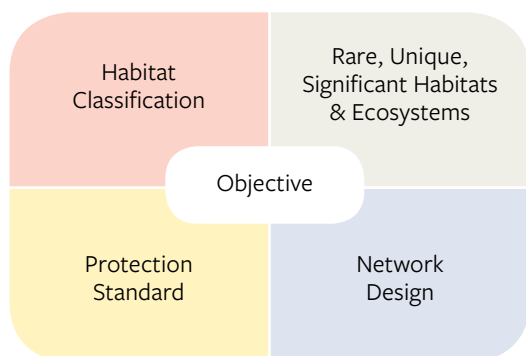
The objective of the MPA Policy, which the Forum must give effect to, is to:

Protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of New Zealand's marine habitats and ecosystems.

To meet this objective, four primary components were considered:

1. Habitat classification
2. Rare, unique and significant habitats
3. Protection standard
4. Network design.

Figure A2-1: The four components that were considered to meet the Marine Protected Area (MPA) Policy objective.



A2.2 Habitat classification

Using the habitat classification defined in the MPA Guidelines,²²⁹ 33 habitat types were identified in the Forum region utilising a number of sources.

²²⁷ Department of Conservation; Ministry of Fisheries 2005: Marine Protected Areas: Policy and Implementation Plan. Department of Conservation and Ministry of Fisheries, Wellington. 25 p.

²²⁸ Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. Ministry of Fisheries and Department of Conservation, Wellington. 54 p.

²²⁹ Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. Ministry of Fisheries and Department of Conservation, Wellington. Table 2, p. 37.

Some habitat names in the MPA Guidelines were not used or were modified in the final dataset for easier interpretation. The main differences between the MPA Guidelines and the habitat names used by the Forum were:

- The use of ‘estuarine’ as a prefix before any estuarine-based habitat types. ‘Estuarine’ was included as a habitat type where no further substrate information was available for an estuarine area
- Calling hard substrate features reefs (e.g. shallow exposed reef)
- The addition of deep water habitats because the planning area contained areas deeper than 200 m
- Referring to areas of ‘low’ exposure as ‘sheltered’.

Kāi Tahu, along with the science and commercial fishing sectors, brought their first-hand knowledge of habitats to the Forum. This knowledge included mātauraka Māori and was complemented by a depth of understanding, including intergenerational knowledge, that was contributed by the other sectors represented on the Forum.

Appendix 5 provides information relating to the habitat classification process, the data that were used and the limitations.

A2.2.1 OUTSTANDING, RARE, DISTINCTIVE OR INTERNATIONALLY IMPORTANT MARINE COMMUNITIES OR ECOSYSTEMS

Several different habitats/ecosystems that occur within the Forum region potentially fall within this category. However, the distribution of only three relevant habitats could be mapped with any degree of confidence, all of which were biogenic habitats: *Macrocystis* (giant bladder kelp) forest; bryozoan thickets off the Otago Peninsula; and seagrass beds. Other biogenic habitats are known to occur within the region, but a lack of sufficient data meant that they could not be reliably mapped.²³⁰ These include:

- Tube worm mats (referred to under several names, i.e. wire-worm, hay paddock, chaetopterids)
- Bivalve beds – kūkuku (horse mussels), kuhakuha (dog cockles)
- Sponge gardens
- Sea tulips
- Kelp and other algae.

A2.3 Meeting the protection standard

The Forum understands that to be a formal ‘Marine Protected Area’, the management tool or combination of tools used must be sufficient to meet the protection standard, which states that the tool(s) must:

... enable the maintenance or recovery of the site’s biological diversity at the habitat and ecosystem level to a healthy functioning state. In particular, the management regime must provide for the maintenance and recovery at the site of:

²³⁰ E.G. Jones et. al. 2016. Biogenic habitats on New Zealand’s continental shelf. Part I: Local Ecological Knowledge. *New Zealand Aquatic Environment and Biodiversity Report No. 174.*

- (a) *the physical features of the site and the biogenic structures that support biodiversity*
- (b) *ecological systems, natural species composition (including all life-history stages) and trophic (the position an organism occupies in a food chain) linkages*
- (c) *potential for the biodiversity to adapt and recover in response to perturbation (changes in the normal state or regular movement of something)*²³¹.

A2.3.1 MARINE RESERVES (TYPE 1 MPAS)

The Forum's objective has been to ensure that a Marine Reserve (or Type 1 MPA) is established to protect an example of each habitat and ecosystem type in the network. This is mentioned as a requirement under Planning Principle 5 of the MPA Policy as well as in the MPA Guidelines.²³²

A2.3.2 OTHER MARINE PROTECTED AREAS (TYPE 2 MPAS)

Other MPAs (or Type 2 MPAs) can be established using fisheries management tools (Fisheries Act 1996), tools under the Resource Management Act 1991 or via special legislation. At a minimum, dredging, bottom trawling and Danish seining are presumed to be disallowed in MPAs because they would not allow the maintenance and recovery of physical features and biogenic structures due to disturbance of the sea bed habitat (see part (a) of the protection standard outlined in Appendix 2, Section 2.3).

The MPA Guidelines require that a case-by-case analysis be undertaken to identify other activities that may not be permitted in a Type 2 MPA. Fishing methods that may be excluded from an MPA if considered to have a detrimental effect within the area include purse seining, midwater trawling, midwater gillnetting and benthic netting. Such exclusions would be imposed to meet part (b) of the protection standard, allowing for the protection, maintenance and recovery of ecological systems, natural species composition, and trophic linkages.

Further restrictions for some MPAs have been proposed based on the specific values associated with the proposal and taking into consideration the tool selection guidelines.²³³

A2.3.3 OTHER PROTECTION TOOLS

There may be cases where the restrictions that are required to protect a habitat or ecosystem would not meet the standards because they would not protect sufficient biodiversity. The MPA Policy provides that the Forum recognises such areas that do not meet the protection standard.²³⁴

While protection tools that do not meet the protection standard can be recommended, the Forum acknowledges that only those areas that meet the protection standard are considered MPAs under the MPA Policy.

²³¹ 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, New Zealand. 54 p.

²³² See the MPA Policy, paragraph 93, and the MPA Guidelines, section 3.3.

²³³ See the MPA Guidelines, p. 22.

²³⁴ See the MPA Policy, p. 18 ('Other marine protection tools').

A2.3.4 THE FORUM'S MANAGEMENT TOOL SELECTION

In choosing appropriate management tools, the Forum considered the relationship between habitat types and potential threats, including the effects of different activities on habitats, be they marine- or land-based (e.g. sedimentation, fishing, mining, tourism and pollution). Tool selection was based on the guidelines set out in Section 3.5 of the MPA Guidelines, including:

- The size of the MPA
- The likely level of extraction from an MPA (from all sources)
- The frequency of extraction
- The type of species being extracted and its ecological importance.

A2.4 Network design: creating a network of MPAs

A network of MPAs can be defined in many different ways. For example, Roff (2005)²³⁵ defined it as:

... multiple sites with replicates of all habitat types that are oceanographically connected; individually or in aggregate they are of sufficient size to sustain minimum viable populations of the largest species in a region (including those of seasonal migrants to the region) and their resident species can sustain their populations by recruitment from one MPA to another.

However, regardless of the specific definition used, it is generally accepted that an ecologically representative network of protected areas should:

- Capture the full range of ecological variability
- Ensure functioning ecosystems by encompassing the temporal and spatial scales at which ecological systems operate
- Provide for the effective management of large-scale processes and patterns.

Moreover, it is considered that multiple reserves, or the replication of similar environments, reduces the risk that populations or habitat will be destroyed by a catastrophe.

In its identification of areas for inclusion in the network, the Forum particularly considered:

- Protecting whole habitats and ecosystems
- The size of protected areas
- Maximising connectivity
- Representing latitudinal and longitudinal variation
- Sea and adjacent land uses
- Keeping boundaries simple.

²³⁵ Roff, J.C. 2005. Conservation of marine biodiversity: too much diversity, too little co-operation. *Aquatic Conservation: Marine and Freshwater Ecosystems* 15 (1):1-5.

The Forum understands that the MPA Policy directs that where possible:

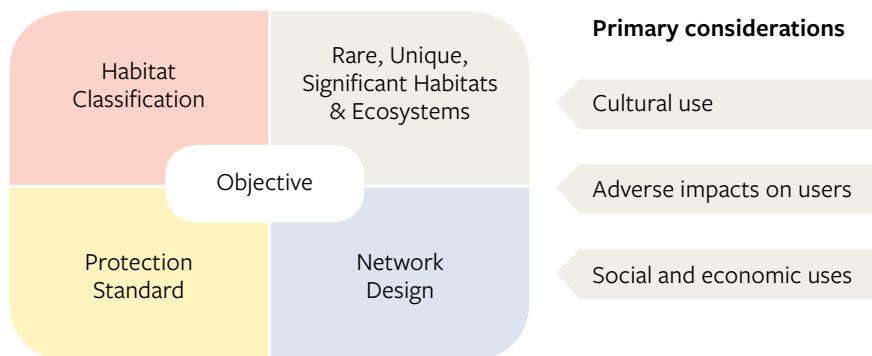
- Examples of each of the habitat types should be protected in a Marine Reserve and replicated in another MPA to ensure that the full range of habitats and ecosystems is represented in the MPA network, whilst minimising the adverse impact on Treaty partners and existing users, where there are alternatives.
- Multiple reserves, or the replication of habitats, should be considered to reduce the risk that entire populations or all examples of a protected habitat are destroyed by a catastrophe. Connectivity is also important as it allows populations in different parts of a species' range to be connected by the movement of eggs, larvae, juveniles or adults.

A2.5 Primary considerations – requirements under the MPA Policy

In addition to meeting the MPA Policy objective as noted above, there are considerations that must be taken into account in forming recommendations (see Figure A2-2). These include:

- Cultural use
- Adverse impacts on users
- Social and economic interests.

Figure A2-2: Primary considerations in meeting the Marine Protected Area (MPA) Policy objectives.



A2.5.1 CULTURAL USE

The MPA Guidelines require the Forum to consider information on traditional use, values, current economic value and Treaty settlement obligations. In addition, the MPA Guidelines call for the Forum to constructively involve and engage with manawhenua whose interest in marine areas may be affected by protected areas. See Section 1.1 – ‘Treaty of Waitangi’ for more detail.

A2.5.2 ADVERSE IMPACTS ON USERS

Where there is a choice of several sites that would add a similar ecosystem or habitat to the network if protected, the site(s) chosen should minimise adverse impacts on existing users and Treaty settlement obligations.

A2.5.3 SOCIAL AND ECONOMIC INTERESTS

When choosing among potential sites, information related to social and economic interests should be considered to minimise adverse impacts on existing users. Such information may include current and potential use for the purposes of extraction or exploration, or the contribution to economic or intrinsic value by virtue of its protection.

A2.6 Further information

The full considerations that are associated with MPA planning can be found in the MPA Policy and Guidelines.

Information on designing MPA networks, including references, can be viewed by downloading the Network Design: Ecological Concepts document on the Forum's website²³⁶.

²³⁶ www.south-eastmarine.org.nz/about/marine-protected-areas

APPENDIX 3: FORUM CONTEXT

A3.1 Introduction to the Forum

The Forum's 16 members come from the south-east South Island community and various representative organisations. Manawhenua and a diverse range of community interests and users of the marine environment are represented.

The Forum's core task was to provide recommendations to the Government on a network of Marine Protected Areas (MPAs) for the coastal marine area between Timaru and Waipapa Point in Southland out to 12 NM (22.2 km) from the coast, including the lower estuarine reaches of some 30 rivers.

The Forum carried out its efforts in accordance with the Marine Protected Areas Policy and Implementation Plan²³⁷ (the MPA Policy) and the Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines²³⁸ (the MPA Guidelines).

A3.2 Forum members

Maree Baker-Galloway	Chairperson, Partner at Anderson Lloyd specialising in Environmental Law, Queenstown
Edward Ellison	Deputy Chair, representing the three Otago Rūnaka, Dunedin
Dr Philippa Agnew	Environmental sector representative, Oamaru
Steve Bennett	Recreational fishing sector, Dunedin <i>Note: Steve Bennett replaced Nelson Cross as a recreational fishing sector representative in December 2016.</i>
Stephanie Blair	Representing Te Rūnaka o Awarua, Invercargill
Simon Gilmour	Commercial fishing sector, Dunedin
Ate Heineman	Commercial fishing sector, Dunedin
John Henry	Representing Arowhenua and Waihao, Timaru
Dr Chris Hepburn	Marine sciences sector, Dunedin
Sue Maturin	Environmental sector, Dunedin
Neville Peat	Community sector, Dunedin
Dr Tim Ritchie	Recreational fishing sector, Dunedin
Fergus Sutherland	Tourism sector, The Catlins
Carol Scott	Commercial fishing sector, Nelson
Emeritus Professor Khyla Russell	Representing the three Otago rūnaka (alternate)
Gail Thompson	Representing Te Rūnaka o Awarua, Bluff (alternate)

²³⁷ Department of Conservation; Ministry of Fisheries 2005: Marine Protected Areas: Policy and Implementation Plan. Department of Conservation and Ministry of Fisheries, Wellington. 25 p.

²³⁸ Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. Ministry of Fisheries and Department of Conservation, Wellington. 54 p.

FORMER FORUM MEMBERS

Pauline Reid	Representing Arowhenua and Waihao, Kāi Tahu (alternate)
Nelson Cross	Recreational fishing sector, Kaka Point

Notes: Pauline Reid passed away suddenly at her home on 26 September 2014. Pauline was a forthright and passionate proponent of customary interests in early Forum meetings.

Former Forum member Nelson Cross passed away on 06 November 2017. Nelson was a long term and dedicated advocate for recreational fishing interests on many fronts, including the Forum.

A3.3 The Forum's Terms of Reference

South-East Marine Protection Forum Revised Terms of Reference With Effect from August 17 2017

The Otago Marine Protection Planning Forum²³⁹ (the Forum) has been endorsed and the Chair appointed, by the Ministers of Conservation and Primary Industries to consider and advise on how integrated marine protection can be achieved in the Otago subregion of the Southern South Island biogeographic region.

The Forum has been established to provide a collaborative process to consider and recommend marine protection options for the Otago region. It has been established in accordance with the Marine Protected Areas Policy and Implementation Plan (MPA Policy) and the MPA Classification, Protection Standard and Implementation Guidelines (MPA Guidelines).

Forum members are broadly representative of stakeholder and user groups with an interest in marine areas and a strong link to the region. Forum members will engage with their sectors of interest and bring those sectors' views forward to the Forum. Forum members will ensure all sectors and interests in the region are able to participate, and will facilitate opportunities for all who wish to have a say on marine protection issues or options in the Otago region.

Objective

The principal objective of the Forum will be to provide a report for Ministers recommending levels of marine protection for the Otago subregion of the Southern South Island biogeographic region, consistent with the MPA Policy and MPA Guidelines.

Specifically the Forum will:

- *Develop marine conservation objectives for the sub-region*
- *Consider classification and inventory information, including use of the best available information*
- *Consult with, and compile information on, existing users and interests in the area*
- *Identify sites and potential tools for area-based protection of biodiversity (refer to the design guidelines page 20 – 21 MPA Guidelines)*
- *Seek to establish consensus on proposed areas to be set aside as protected areas*
- *Consult on protection options*
- *Make written recommendations to Ministers.*

²³⁹ The Forum changed its name from the Otago Marine Planning Forum to the South-East Marine Protection Forum in October 2014.

MPA targets and Considerations

The Forum's recommendations should aim to achieve the MPA Policy objective at a "Forum region" level – that is to: "protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of [Otago's] marine habitats and ecosystems".

The Forum should give consideration to the Biodiversity Strategy (2000), and the Convention on Biological Diversity and its objectives of establishing ecologically representative and well connected systems of Marine Protected Areas.

In keeping with the MPA Policy, the Forum should focus on recommending a mix of protection tools (including Marine Reserves) to provide coverage of a representative range of habitats and ecosystems, while recognising that the role of the Forum is to implement the MPA Policy at the sub-bio regional scale. The Forum should focus on outcomes and select the best tool available to achieve the objectives of the Forum.

Scope

The geographical boundary of the Forum:

- *The landward boundary should be the marine environment*
- *The seaward boundary should be the 12 NM territorial sea limit*
- *Southern and Northern Boundaries are shown on the map in Appendix 3 and are Waipapa Point in the South and Timaru in the North.*

The scope of the tools that the Forum may consider are limited to those that provide for protected area planning, the Forum should not be diverted by Resource Management Act, aquaculture or fisheries management issues (refer to MPA Policy integrating marine tools page 11 for guidance on tools available).

Bearing in mind planning principle 7 (MPA Policy page 19), where the Forum identifies that it needs additional information, it will in the first instance seek the assistance of the Department of Conservation (the Department) and the Ministry for Primary Industries (the Ministry)

Change to Legislation or National Biodiversity Strategy

Should relevant legislation or the New Zealand Biodiversity Strategy change during the life of the Forum, the Terms of Reference may need to be updated. In this case, Officials will recommend an updated Terms of Reference if the Forum has not formulated its recommendations.

Consultation

The Forum will convene a collaborative process and will constructively involve and engage with manawhenua, regional councils, marine biodiversity interest groups including Otago University, and the users and stakeholders whose interests in marine areas may be affected by protected areas and the Forum's recommendations.

The Forum will plan its regional engagement considering the best tools to build links with the community within its budgetary constraints.

The Forum must undertake written consultation (allowing a minimum of 40 working days for submissions) on draft recommendations prior to finalising the report to Ministers.

The Department and the Ministry will support the Forum in carrying out its consultation and will ensure Crown obligations under the Treaty of Waitangi are upheld.

The Recommendations of the Forum

The Forum should endeavour to reach a consensus on recommendations.

The Report to Ministers

The Forum will produce a report for Ministers recommending various levels of marine protection, identifying both areas and tools, as described on page 18 of the MPA Guidelines.

Communications with the media

A communications plan will be developed for approval by the Forum.

Funding

The South-East Marine Protection Forum process will be funded by the Department, with additional resourcing provided by the Ministry. The Forum must complete the process within the allocated budget, and monthly reports on expenditure will be provided to the Forum.

Servicing

The Forum will be serviced and supported by the Department and the Ministry (MPA Guidelines p16).

Agency officials will support the Forum by providing advice and guidance to the Forum members. It is expected that their knowledge and experience will be sought throughout the process. Advice and resources provided by agency officials will include:

- *international standards and best practice;*
- *information visualisation and decision support tools;*
- *marine protected area design and boundaries; and*
- *information on the spatial distribution of marine habitats and human activities in the region.*

In jointly servicing the Forum, the Department and the Ministry will establish a project structure with a Governance Board to monitor progress and support the Chair in managing risks and issues. Along with the agency officials, a member of the Governance Board will attend Forum meetings, to observe progress and provide guidance as necessary.

The Chair of the Forum will regularly report to, and work with, the Governance Board around the Forum's progress in meeting its milestones.

Timeframes

The final recommendations to Ministers are due on 20 December 2017. The table below outlines the milestones that the Forum will need to meet in order to make its recommendation to Ministers by 20 December 2017.²⁴⁰ The Forum will report to the Governance Board on a monthly basis on the achievement of milestones with a red light/green light reporting system.

²⁴⁰ Note, in December 2017, the Forum was granted a short administrative extension to January 19, 2018, to complete the design and publication of the Forum's Recommendations Report.

Milestone	Complete	Progress Gate
Final deliberations completed, incorporating feedback from submission process into marine protection recommendations	20 September 2017	Progress gate – if not met agencies will consider terminating process
Deliberations report provided to Governance Board	29 September 2017	No
Draft recommendations report to Governance Board for review	20 November 2017	No
Final Recommendation Report to Ministers	20 December 2017	Progress gate – if not met agencies will consider terminating process

Achieving these timeframes will require a significant time commitment from Forum members. The Governance Board's expectation is that the Forum will need to meet approximately every three weeks, with the inclusion of some two-day meetings.

No further extension to the project deadline will be granted. The Governance Board may need to terminate the project if the timeframes above are not met.

A3.4 Conflicts of interest

Forum members were signatories to the Internal Forum Protocol, which included the following principles in regard to conflicts of interest:

- *Members are to declare when they have a pecuniary or financial interest relevant to items on the agenda. Declarations of conflicts of interest other than pecuniary interest are at the discretion of the members.*
- *Members are on the Forum as representatives of particular stakeholders, representing particular points of view, therefore it is accepted to the extent that this can be considered to result in a certain element of bias, that is accepted by the Forum.*
- *When conflict of interest arises, the member should declare it to the meeting.*
- *The Forum will decide on a case by case basis the role the member is to play in the specific discussion in respect of which they have declared their conflict. In some cases a member may remain to contribute on matters of fact or to answer questions from other members, but on other occasions withdrawal from the meeting is better protection both for the Forum and the member with the conflict.*
- *The declaration of any conflict of interest must be recorded in the minutes and noted on the conflict of interest register.*

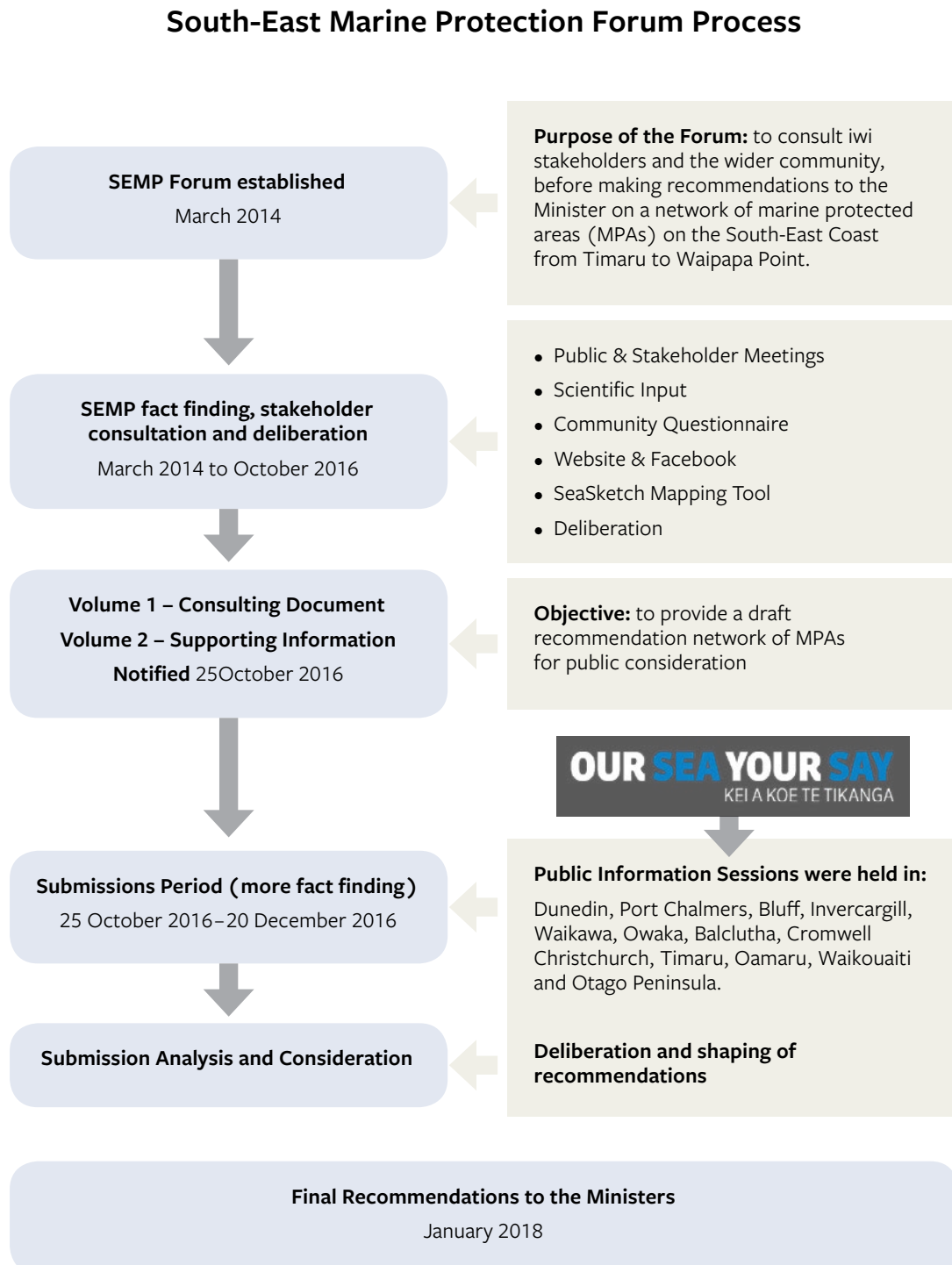
These principles were adhered to during deliberations.

In addition, following the consultation process, a Submissions Conflicts Register was established in which declared conflicts of interest were recorded for each Forum member.

It was agreed by the Forum that members would not sign submissions. Two previously-received submissions signed by Forum members were subsequently amended to remove their names, with other non-Forum members of the relevant group or organisation signing the submissions instead.

A3.5 The process

Figure A3-1: The South-East Marine Protection Forum process.



A3.6 Stakeholder engagement

The Forum members endeavoured to meet with a wide range of people having an interest in the process in order to provide individuals and groups with an opportunity to express their viewpoints. The process followed by the Forum was consistent with Planning Principle 4 of the MPA Policy. The process is set out in detail in Appendix 3 of the Consultation Document Volume II and is summarised below:

- a) The Forum was first convened in mid-2014 and has met many times since.
- b) An online questionnaire, *Our Sea Your Say – Kei A Koe Te Tikanga*, was one of the early points of contact with stakeholders. This provided the Forum with the opportunity to gather broad information and perspectives from respondents. The questionnaire covered a wide range of topics, including area particulars, ongoing respondent activities, observations and opinions on the need for protection. In total, 90% of the 301 respondents said ‘yes something needs to be done to protect marine values of the region’ and only 8% said ‘nothing needs to be done’.
- c) A series of public meetings introduced communities to the goals of the MPA Policy, as well as the role of the Forum in particular. These meetings provided the Forum with an invaluable opportunity to learn about the issues and concerns of local communities.
- d) The Forum website www.south-eastmarine.org.nz was developed as the primary communication tool for community engagement.
- e) The online tool SeaSketch was employed to engage stakeholders and the public in developing plans. SeaSketch is a valuable resource that supports collaborative marine spatial planning and provides easy to find marine information.
- f) Facebook has also been used to raise public awareness of opportunities to contribute to Forum decisions and provide an avenue for feedback.
- g) Advertisements were placed in relevant daily newspapers and a variety of magazines. These contained a call to action, encouraging people to contribute via an 0800 number, online or by post.
- h) A database of interested parties was established, with members receiving regular email newsletters notifying them of the Forum’s progress.
- i) There has been widespread distribution of two information posters and a fact sheet throughout the Forum region.
- j) The Forum worked through the tasks of the MPA Policy using the MPA Guidelines to develop proposals for consultation.
- k) In October 2016, the Forum released its Consultation Document, which was published in two volumes (Volume I contained the Consultation Document itself while Volume II provided the supporting background information and reference material). The Forum consulted on 20 proposed sites discussed within this document to make its network recommendations.
- l) A Summary of Submissions was prepared by an independent submissions analyst. (See Appendix 4.2).

- m) A Summary of Science Submissions was prepared by an independent scientist. (See Appendix 4.3).
- n) Forum members prepared Stakeholder Summaries for each of their respective stakeholder groups.
- o) The Forum utilised access to all submissions, as well as supplementary information and data from supporting agencies, in the development of the final recommendations within this report.

A3.7 MPA planning tools – SeaSketch

A3.7.1 GEOSPATIAL DATA LAYERS

A comprehensive set of mapped information was provided to the Forum via the online mapping tool SeaSketch.²⁴¹ This encompassed over 100 different data layers, including:

- Habitats
- Commercial fishing intensity
- Existing restrictions under the Fisheries Act 1996
- Fisheries statistical areas
- Public conservation land
- Land use
- Accessibility
- Existing consents (e.g. discharges, dredge spoilt dumping, structures)
- Management boundaries
- Māori reserves
- Ngāi Tahu Claims Settlement Act 1998 information
- Seabird distribution and breeding sites
- Marine mammal sightings and foraging areas
- River catchments and water quality
- Seafloor imagery (multibeam and photos).

A3.7.2 REPORTING AND ANALYSIS

SeaSketch also allows users to carry out an analysis of sites based on the protection tools proposed, providing real-time feedback on how well the sites and networks meet policy objectives. The specific reports include information on habitats, commercial fishing and other existing uses. The full set of reports for any specific area, can be run direct from SeaSketch.

SeaSketch was also used as an online submission tool, providing respondents with direct access to much of the data and information that was used by the Forum.

²⁴¹ www.southeastmarine.seasketch.org

A3.8 Consultation

The Consultation Document can be accessed through the Forum's website at www.south-eastmarine.org.nz:

- Consultation Document – Volume 1 (164 MB)
- Consultation Document – Volume 2 – Supporting Information (113 MB)

A3.9 Deliberations and decision making

The Forum's deliberations process involved two steps: a site-by-site analysis and the MPA network design process.

A3.9.1 SITE-BY-SITE ANALYSIS

The Forum worked its way through each site that was consulted on using a deliberation record that contained all of the existing information that the Forum had about the site. New information provided in submissions was added to this record.

Site-by-site analysis was undertaken in two stages. In Stage 1, the Forum assessed the site for its habitat types, viability as an MPA, kaitiakitaka currently practiced and available management tools / protection measures. In Stage 2, the Forum assessed the impacts on users – both positive and adverse.

After each of these stages, the Forum gave the site one or more of the following classifications:

1. Confirmed or withdrawn as a recommended site
2. Flagged as a site requiring further discussion / information
3. Subject to changes or negotiation, and / or the evaluation of network design matters.

A3.9.2 MPA NETWORK DESIGN

During the network design process, the Forum considered the following factors:

1. The extent to which the full range of habitat or ecosystem types is protected in a Marine Reserve; gaps in terms of the protection of habitat types, including rare, distinctive or internationally or nationally important habitat types, were identified.
2. The level of connectivity between MPAs.
3. The extent of latitudinal and longitudinal variation (north to south and across the shelf).
4. The replication of different habitat types.

When a choice had to be made between similar sites, the deciding factors the Forum took into account included the need to minimise adverse effects on Treaty settlement obligations and existing users, as per the MPA Policy.

Where there was a choice between minimum-impact sites, the Forum was also guided by:

1. Accessibility for management and enforcement requirements.
2. Benefits such as educational, diving and tourism opportunities.

A3.10 Role of agencies

The Department of Conservation (DOC) and the Ministry for Primary Industries (MPI) have provided support and advice to the Forum. This has included support for the drafting of the proposals for consultation and the drafting of the recommendations report.

A3.10.1 GOVERNANCE GROUP

DOC: Marie Long (Chair), Astrid Nunns, David Newey, Sean Cooper, Andy Roberts

MPI: Christine Bowden, Dave Scranney and Dave Turner

Ngāi Tahu: Matapura Ellison

Ngāi Tahu: Nigel Scott

A3.10.2 SUPPORT STAFF

DOC: Sarah Bagnall, Helen Chapman, Kim Morgan, Rebecca Bird, Nicole Mistal, Ronnie Anderson, Adrian Gilby, Leeann Ellis, Kate Tanner, Ruth Mackenzie-White, Greig Funnell and Judy Rodda

MPI: Tania Cameron, Rob Tinkler, Blake Abernethy and Riki Mules

Gillian Thomas and Associates Ltd: Gillian Thomas

APPENDIX 4: SUBMISSIONS

A4.1 Overview

A total of 2803 submissions were received in response to the Consultation Document, among which:

- 990 were submitted via hard copy
- 1331 were submitted via email
- 482 were submitted via SeaSketch.

Many submitters completed ‘template’ (or pro forma) submissions, which had been drafted by an organisation for use by others. Pro forma submissions during the consultation process were received from Forest and Bird (1084 submissions), Fish Forever (141 submissions) and Tautuku Fishing Club (739 submissions).

Submissions reflected the public’s diverse views. Some expressed the desire to have more and larger Marine Protected Areas (MPAs), particularly Marine Reserves, while others supported minimising the impact on users of the marine environment by proposing smaller and / or fewer MPAs, and instead utilising Fisheries Act tools in preference to Marine Reserves.

In designing a network, the South-East Marine Protection Forum (the Forum) considered the views and information provided through the submission process, along with additional information sourced from Forum members and support agencies. The Forum evaluated every submission on its own merits.

Submissions can be downloaded from the Forum website. All private and commercially sensitive information has been removed.

A4.2 Summary of submissions

To support the Forum in its deliberations process, the Department of Conservation commissioned an independent analyst to provide a Summary of Submissions. This summary sought to provide an overview of the key points raised within the submissions received and can be viewed on the Forum website www.south-eastmarine.org:

- Summary of Submissions (9 MB)

A further summary containing commercially sensitive information was produced for the Forum to ensure that all submission information could be considered in a summarised form. This document has not been included on the Forum website due to its inclusion of potentially sensitive information.

A4.3 Summary of Science Submissions

An independent scientist was commissioned to provide a summary of scientific information contained within the submissions received. This information was not included in the Summary of Submissions.

This scientific summary can be viewed on the Forum website www.south-eastmarine.org:

- Summary of Science Submissions (4 MB)

APPENDIX 5: HABITAT CLASSIFICATION

Appendix 1 of the MPA Guidelines²⁴² describes in detail the classification process that was used in forming the habitat layer utilised in Marine Protected Area (MPA) planning. Below is a summary of that information and how it pertains to the South-East Marine Protection Forum (the Forum) regional process.

A5.1 Importance of consistent classification

New Zealand's diverse marine environment covers an area of approximately 4.1 million km². Beneath the waves is a diverse range of marine biota, such as kelp forests, sponge gardens, shellfish beds and deep-water coral communities, all of which are interwoven through complex interactions between biological and physical processes. Ideally, any classification should be based on detailed knowledge of the distribution and relative importance of marine biota. However, a full inventory of habitats and ecosystems does not currently exist, and biological information is missing, incomplete or at an insufficient resolution for many areas. Therefore, an alternative approach was required to help identify where to place representative protected areas.

A5.2 Classification approach

The classification system consists of a hierarchy of five layers that categorise a physical environment. The first layer of the classification is the biogeographic region, which comprises the Southern Coastal biogeographic region (within which the Forum region falls). This approach assumes that physical habitats and ecosystems, if separated by enough space (hundreds to thousands of kilometres), will contain different biological communities due to a combination of broad-scale factors such as water temperature, oceanography, current dynamics, large-scale latitudinal gradients, climate or barriers to dispersal. The second layer of the classification is the environment, which is separated into estuarine and marine. This layer recognises that there are fundamental differences in biology associated with estuarine and marine environments. The third, fourth and fifth layers of the classification are depth, exposure and substrate type, as these three factors are thought to most strongly influence a site's biology. Within each biogeographic region and environment type, combinations of depth, exposure and substrate type represent habitats to be protected giving 44 potential habitats that should be protected – although not all of these will be present in every biogeographic region.

A5.3 Classification of the Forum region

The Forum region's marine habitat layer was guided by the MPA Guidelines, as well as best available information provided by the National Institute of Water and Atmospheric Research (NIWA), Land Information New Zealand (LINZ) and the regional authorities neighbouring the planning area. The habitat layer was created by merging data layers representing biogeographic region, environment type, depth, substrate and exposure to create a classified habitat dataset.

²⁴² Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. Ministry of Fisheries and Department of Conservation, Wellington. 54 p.

The landward extent of this dataset is based on the coastal marine area boundaries reported within regional coastal plans. These are administrative boundaries (rather than ecological based) and so do not represent the true upper extent of the estuarine environment. However, these boundaries were adequate for the purposes of MPA planning within the Forum region.

The habitat classification is intended to provide a general indication of the various habitat types present within the Forum region. It was created using the best information available at the time, but it has known limitations. Therefore, care should be taken when forming decisions based solely on this data.

The following sections describe the methodology and data sources used in the creation of the Forum's marine habitat dataset.

A5.3.1 DEPTH

Coastline boundaries were sourced from the LINZ Data Service and consisted of Topo50 coastlines, islands, lakes, lagoons and river polygons. The inland extent of rivers and estuaries were determined using the landward extents of coastal marine areas recorded in regional coastal plans. The resulting coastline dataset was used to represent the mean high water springs (MHWS) boundary. The marine extent was determined using the south-east marine planning area and the Southern South Island biogeographic area, which extends out to the 12 NM territorial sea boundary. Some smaller features within the Topo50 islands dataset that represented partially submerged rocks were removed as they were considered to represent an intertidal rocky reef habitat type.

The intertidal zone within the Forum region was created by digitising intertidal areas that were visible within aerial imagery. The majority of imagery sources were published by regional/district councils and LINZ in the form of Web Map Services. Each Web Map Service was comprised of a mosaic of aerial images held by each organisation (i.e. LINZ, Environment Canterbury, Otago Regional Council and Dunedin City Council). Before an intertidal zone was created, all possible imagery sources were inspected and the image that was assumed to have been captured closest to low tide was used to create the intertidal shape. Since an image representing low tide was not always available, the areas identified as being intertidal within this dataset should be treated as an estimate for the mean low water springs (MLSW) boundary. In addition, there were areas where the mean high water springs (MHWS) boundary intersected with marine areas that were visible within the imagery sources. In these instances, the intertidal zone was drawn within the marine area at a proportional size to that visible within the imagery. Due to the reporting required by the MPA planning process, it was more important to maintain accurate proportions of habitat types rather than absolute spatial accuracy.

The 30 m and 200 m contour lines (boundaries between shallow/deep subtidal and deep-water areas) were sourced from data provided by NIWA,²⁴³ and were based on a combination of available bathymetry data sources (depth sounding, multibeam, navigational charts, contours and point depth values). These data were provided in both bathymetry contour format and as a Digital Elevation Model (DEM). Where the bathymetry contours did not cover the entire marine area, the DEM datasets were used to fill any gaps.

²⁴³ Nodder, S.; Mackay, K.; Schnabel, K.; Wood, A.; Jenkins, C. 2014: Otago Marine Protected Area planning sediments and substrates GIS products.

The depth values were assigned as:

- Intertidal (MHWS to MLWS)
- Shallow subtidal (MLSW to 30 m depth)
- Deep subtidal (30–200 m depth)
- Deep water (>200 m depth).

A5.3.2 SUBSTRATE

The benthic substrate information that was used to create this dataset was sourced from NIWA, LINZ, Otago Regional Council and the 2011 MPA Policy habitat dataset.²⁴⁴ Aerial imagery sourced from LINZ, Environment Canterbury, Otago Regional Council and Dunedin City Council was also used to verify and, if needed, update the substrates visible near the coastline.

NIWA provided the majority of the offshore marine substrate information.²⁴⁵ Sample information was gathered from the NIWA dbSEABED database system and analysed by NIWA to create three separate datasets representing the percentage content of mud, sand and gravel, respectively, within the area of interest. These datasets were provided in a 500-m-grid format. The three datasets were reclassified so that cells containing values of 50% or higher were considered to be dominated by a single substrate type, while any cell containing less than 50% of each substrate type was removed. The reclassified substrate datasets were then merged together and used to form the bases of the updated marine substrates dataset.

Rocky substrate types were sourced from a national rocky reef dataset, which was created using a combination of LINZ navigation charts of varying scales and expert knowledge. This dataset was also incorporated into the 2011 MPA Policy habitat maps and provided a broad-scale representation of rocky reef locations. Additional reef areas were identified by local commercial fishermen and through the analysis of LINZ multibeam shipping surveys using the Benthic Terrain Modeler add-on for ArcGIS.

Finer-detailed coastal substrate information was sourced from LINZ Topo50 polygons available on the LINZ Data Service. Sand and rock Topo50 datasets were used to provide coastline substrate types, while sand and mud Topo50 datasets were used to provide the basis for estuary substrate types. Since the sand and mud Topo50 datasets had considerable overlap within estuary environments, the 2011 MPA Policy habitat dataset was used to help guide appropriate substrate values.

Additional fine-scale estuary substrate data were sourced from Otago Regional Council. The Otago Regional Council estuary classifications were made between 2007 and 2008, some of which were reclassified using the 2011 MPA Policy habitat dataset as a guide in order for the habitat values to meet the substrate classifications outlined in the MPA Guidelines. The features within the Otago Regional Council estuarine dataset required extensive cleaning before the data could be incorporated into the final substrate dataset, as many small features were present that would not be visible at the intended viewing scale of the final dataset –

²⁴⁴ Breen, D. 2011: Coastal marine habitats and marine protected areas in the New Zealand Territorial Sea: a broad scale gap analysis. Department of Conservation and Ministry of Fisheries, Wellington. 50 p.

²⁴⁵ Nodder, S.; Mackay, K.; Schnabel, K.; Wood, A.; Jenkins, C. 2014: Otago Marine Protected Area planning sediments and substrates GIS products.

these small features were either removed or merged into neighbouring substrate types. Other regional councils within the Forum region did not have estuarine substrate datasets available at the time this dataset was created.

The 2011 MPA Policy habitat dataset was used to fill any gaps where other information was not available. Where substrate information within estuary areas was not available, the substrate was classed as being 'estuarine'.

Along the coastline of the Forum region, aerial imagery was used to verify the accuracy of the sourced substrate information. Where the substrate information did not match what was visible in the aerial imagery, the substrate dataset was modified to better conform to the imagery. Rock and sand substrate type boundaries were the most likely to require modifications.

A5.3.3 EXPOSURE

Exposure data were sourced from the 2011 MPA Policy habitat dataset. Some estuarine areas included within the Forum region boundaries were not represented within this dataset and so were classified as being 'estuarine' as this was the best available fit.

A5.3.4 HABITAT LAYER CREATION

The final habitat classification layer was created by merging the depth, substrate and exposure layers mentioned above, as well as a layer representing the biogeographical region.

The classification of the different habitat types was completed using the MPA Guidelines. Some habitat class names that are present in the guidelines were not used or were modified in the final dataset. The main differences between the guidelines and the habitat dataset were the use of 'estuarine' as a prefix before any estuarine-based habitat types; naming rocky features reefs (e.g. shallow exposed reef); and the addition of deep-water habitats as the planning area contained areas deeper than 200 m. Biogenic habitats were supplied as separate datasets and included *Macrocystis* and seagrass,²⁴⁶ and bryozoan thickets.²⁴⁷

The resulting data layer contained an extensive amount of 'slivers' where two or more features in the original datasets did not fully align. These slivers were usually very small and / or narrow, and could make interpretation of the final data layer difficult. The slivers were removed by merging them into neighbouring features, using aerial imagery to guide which features should be merged. The final habitat dataset was intended for viewing at a maximum scale of 1:9028 and any slivers or features that were not visible at this scale were removed.

Finally, the habitat dataset was overlaid on top of aerial imagery to verify whether the assigned habitat classes matched the imagery. The coastline for the entire Forum planning area was inspected and any necessary changes made. Sand- and rock-based habitat types were the most likely to receive modifications during this phase. Any changes to the final habitat layer have been recorded within the source datasets that were used to create the final habitat data layer.

The resulting habitat layer for the Forum region included 22 coastal habitats and ten estuarine habitats (Figure A5-1).

²⁴⁶ Fyfe, J.; Israel, S.A.; Chong, A.; Ismail, N.; Hurd, C.L.; Probert, K. 1999: Mapping marine habitats in Otago, southern New Zealand. *Geocarto International* 14(3): 17–28.

²⁴⁷ Wood, A.; Probert, P. 2013: Bryozoan-dominated benthos of Otago shelf, New Zealand: its associated fauna, environmental setting and anthropogenic threats. *Journal of the Royal Society of New Zealand* 43(4): 231–249.

A5.4 Regional variation

It is important to note that the national classification scheme based on broad environmental drivers (as a surrogate for biological patterns) may not effectively reflect the actual regional patterns of biodiversity when applied to individual regions.

Several factors influence the Forum region's marine environment that are not accounted for explicitly in the habitat classification and are thus likely to produce regional variation both across the shelf and latitudinally. These factors include the Southland Current, a major influence on the Otago/Southland coastal systems; the geomorphology, such as headlands, particularly the Otago Peninsula; and two canyon heads that extend substantially into the territorial sea of the Forum region.

The distribution of species as observed through modelling (e.g. fish, bryozoans) and biological survey (e.g. seaweeds, seabirds), along with the clear variability in fishing efforts demonstrate that regional variation is not accounted for particularly well in the habitat classification.

The MPA Guidelines recognise this limitation of the classification process and include guidance on latitudinal and longitudinal variability when identifying sites:

***Represent latitudinal and longitudinal variation** – Many processes create latitudinal and longitudinal (cross-shelf) differences in habitats and ecosystems. This diversity is reflected partly in the distribution of the biogeographic regions, but care should be taken to identify potential protected areas sites that include differences in habitats and ecosystems that cover both latitudinal and longitudinal or cross-shelf ranges. It may be convenient to extend protected areas from the intertidal zone to deep waters offshore.²⁴⁸*

A5.5 Limitations, errors and inconsistencies

The broad-scale classifications were designed to be useful at a scale that was appropriate for the planning process. As such, finer detail, including knowledge that is intuitively held by locals, tended to be poorly incorporated into the habitat classifications. This is an inherent limitation of broad-scale classifications that use modelled physical drivers. This does not negate the usefulness of such classifications in the planning process, but does mean that those relying on these classifications should be mindful of their limitations.

While every effort has been made to obtain the best available information in creating the habitat classification for the Forum region, a number of errors and inconsistencies have been identified by Forum members and the public through submissions.

During the construction of the habitat classification, a draft data layer was incorporated into the complete habitat classification in error. This resulted in some habitats being shown in the wrong location or classified incorrectly. This error related to the treatment of 'foul ground', a mixture of soft-sediment and hard-rock substrates, as being a continuous reef in the habitat classification. This error was identified post-consultation and thus some information within the Consultation Document was erroneous. Once the error was discovered, these data were

²⁴⁸ Ministry of Fisheries; Department of Conservation 2008: Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines. Ministry of Fisheries and Department of Conservation, Wellington. 21 p.

corrected and the new information was utilised for all further analysis and discussion within the Forum. The main impacts of the error were a misrepresentation of reef habitats on the map and inaccuracies in the data used to determine how much of each habitat was captured in the proposed sites. The majority of the erroneous habitat classification, however, occurred outside the sites that were identified as recommended locations going forward and thus had relatively little overall effect on the process. Sites E1 (a Type 2 MPA over the canyons and bryozoan thickets) and K1 (a Marine Reserve around Okaihae (Green Island)) included errors that resulted in reef habitats being listed as present in the Consultation Document (reef habitat was absent from Site E1 and was present in a lower amount than noted at Site K1).

In addition to the known error above, some habitat types had a low certainty in their extent (or whether they actually occur in a particular location at all). For example, the reef habitat at Site M1 – Akatore Coastal shows the reef extending for approximately 600 m from the shoreline. The experience of several Forum members and stakeholders clearly suggests that the reef does not extend that far and instead drops to sand very quickly. This potential inconsistency has implications in terms of reserve design for this site, as discussed in the site record.

Another example, is an area that was identified as ‘deep mud’ offshore from Harakeke Point / Tow Rock (near Site I1). This habitat is questionable as local knowledge of the area suggests that mud is not substantially present (and this was verified by samples taken from the area, which clearly showed less than 50% mud composition). A subsequent investigation of the base data used in the habitat classification indicated that no samples had been taken from within this area and that the habitat was ‘determined’ only through modelling. Thus, there is a high probability that this habitat is merely an artefact of the modelling and does not represent the actual composition of this location. While this area of mud is retained in the habitat maps (and will remain so until such time as the habitat type is verified by survey), the Forum has taken this into account in making their recommendations.

A further example occurs where a reef is shown in the habitat map several kilometres south of Tow Rock. Local knowledge indicates that this reef is unlikely to occur. Again, until this is verified by survey it remains in the habitat classification. This area is not included within any of the proposed sites and therefore has little effect on the recommendations.



These errors and limitations of the habitat classification demonstrate why caution should be used when interpreting habitat maps. The habitat classification provides a broad-scale basis for planning, but should be augmented during planning processes with local knowledge and additional information where available.

A5.5.1 FORUM REGION HABITAT MAP





Figure A5-1: Classified habitat types of the Forum region (a)

Legend to habitats

Management areas

-  Marine Reserve
-  Type 2 MPA
-  Forum region

Coastal habitats

-  Bryozoan known
-  Bryozoan most abundant
-  *Macrocystis*
-  Foul - Sand/Rock


Mud

-  Moderate Shallow Mud
-  Exposed Shallow Mud
-  Deep Mud
-  Deep Water Mud








Gravel

-  Sheltered Shallow Coarse Sand
-  Moderate Gravel Beach
-  Moderate Shallow Coarse Sand
-  Exposed Gravel Beach
-  Exposed Shallow Beach
-  Deep Gravel
-  Deep Water Gravel









Boulder

-  Exposed Boulder Beach

Reef

-  Sheltered Intertidal Reef
-  Sheltered Shallow Reef
-  Moderate Intertidal Reef
-  Moderate Shallow Reef
-  Exposed Intertidal Reef
-  Exposed Shallow Reef
-  Deep Reef

Sand

-  Sheltered Sandy Beach
-  Sheltered Shallow Beach
-  Moderate Sandy Beach
-  Moderate Shallow Beach
-  Exposed Sandy Beach
-  Exposed Shallow Beach
-  Deep Sand
-  Deep Water Sand

Estuarine habitats

-  Estuarine
-  Estuarine Boulder Beach
-  Estuarine Boulder Reef
-  Estuarine Cobble Beach
-  Estuarine Cobble Beach
-  Mud Flat
-  Estuarine Gravel Beach
-  Estuarine Gravel Field
-  Estuarine Intertidal Reef
-  Estuarine Reef
-  Estuarine Sandy Beach
-  Estuarine Sand Flat

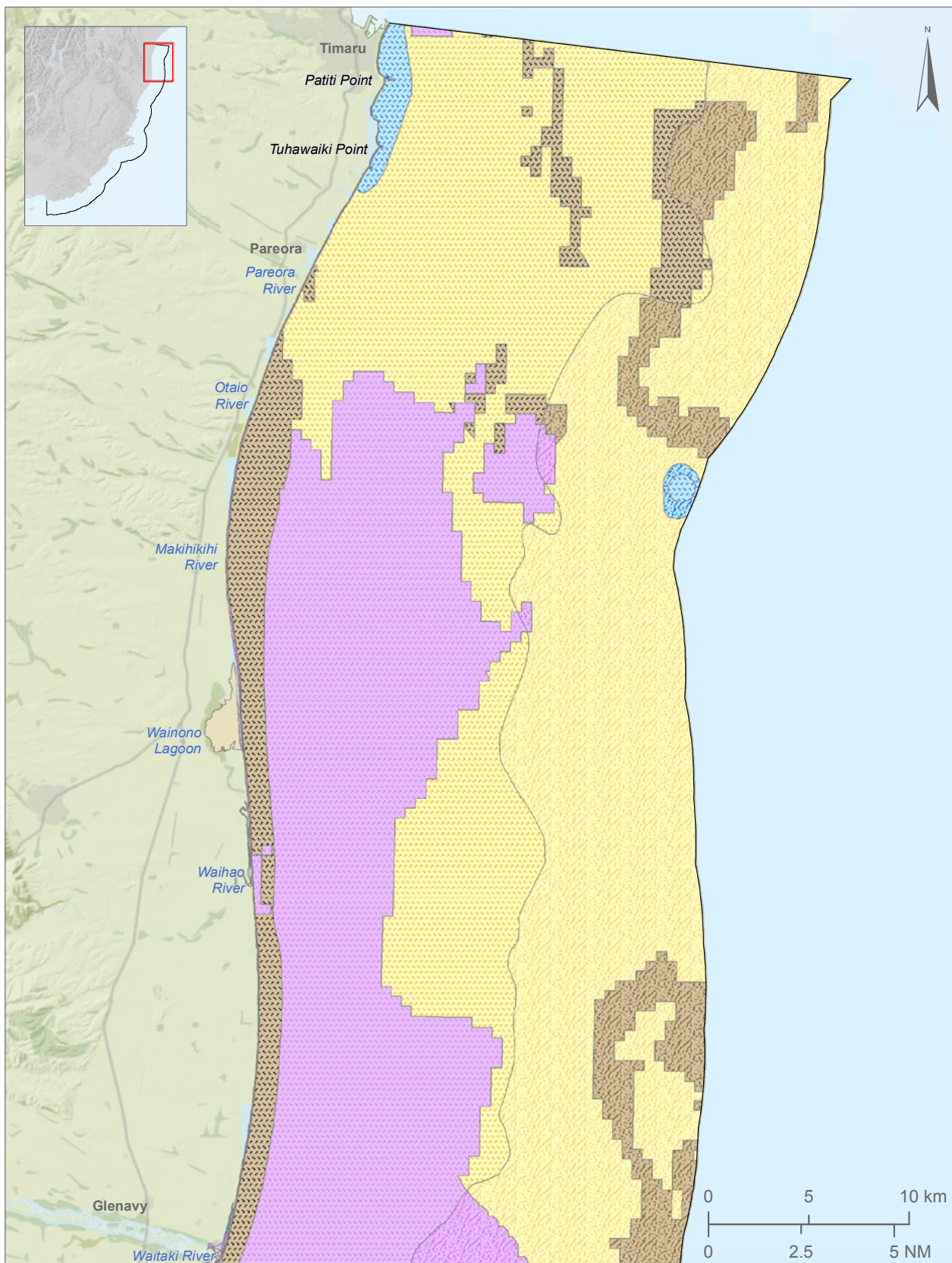


Figure A5-1: Classified habitat types of the Forum region (b)
South Canterbury Bight

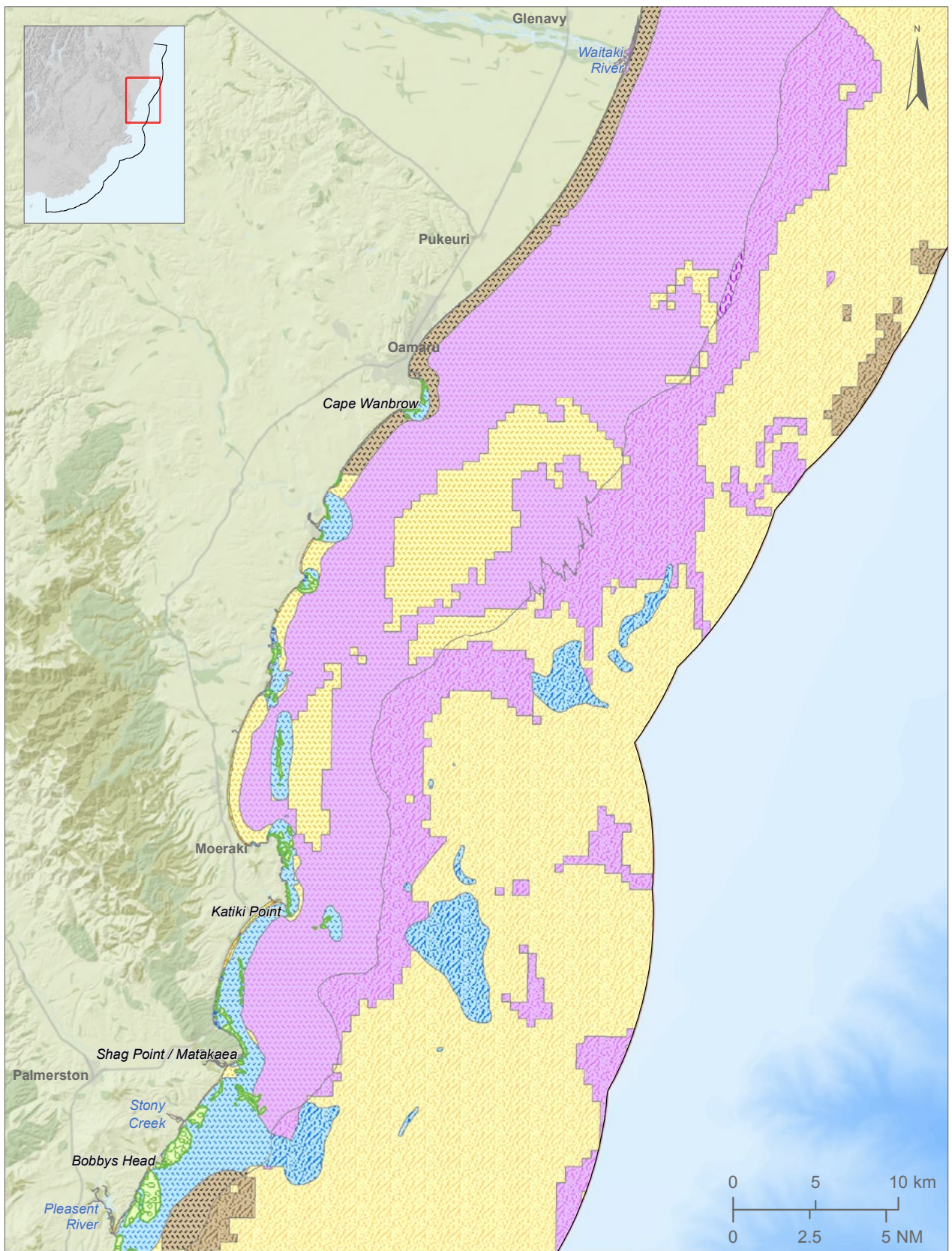


Figure A5-1: Classified habitat types of the Forum region (c)

North Otago

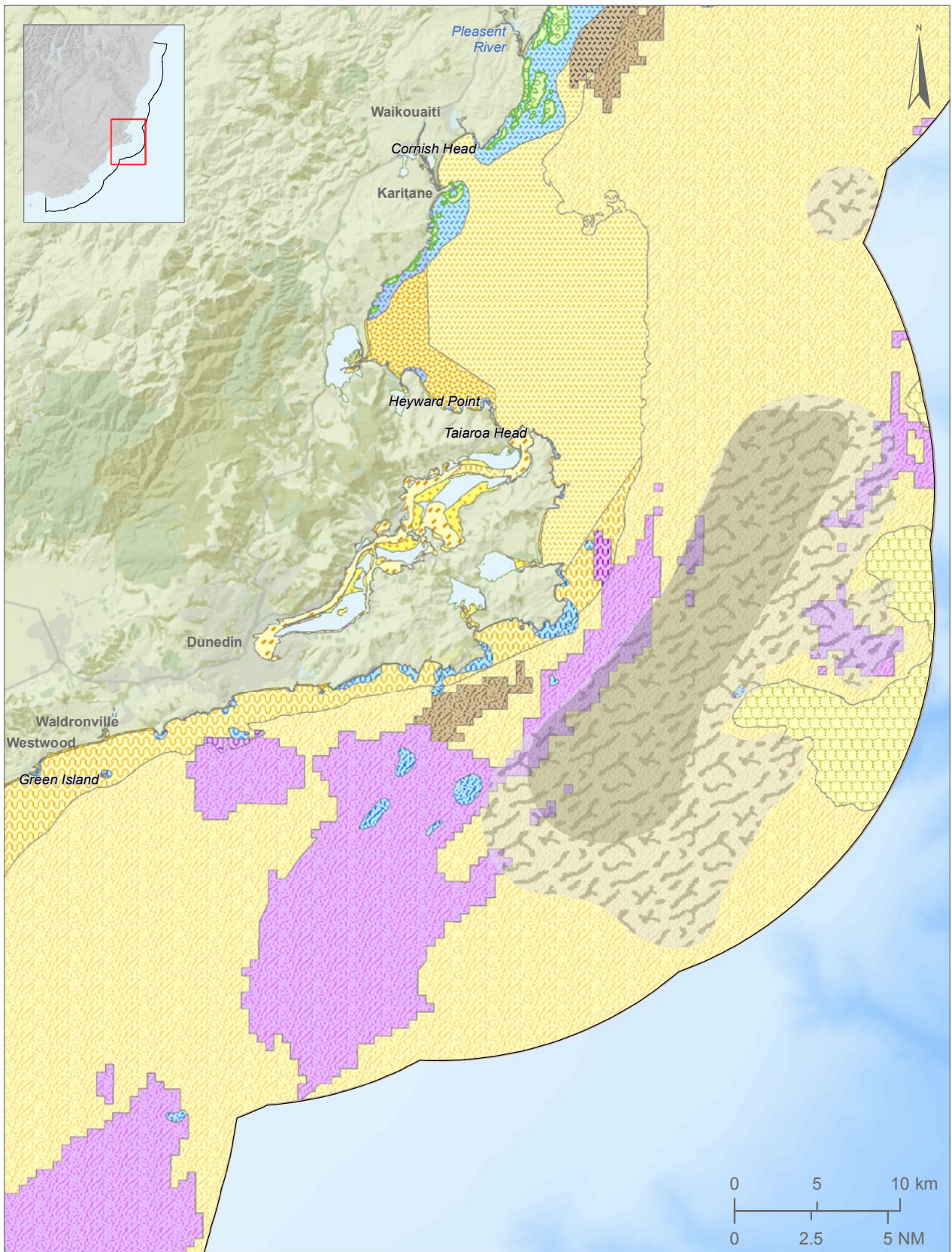


Figure A5-1: Classified habitat types of the Forum region (d)
Otago Peninsula

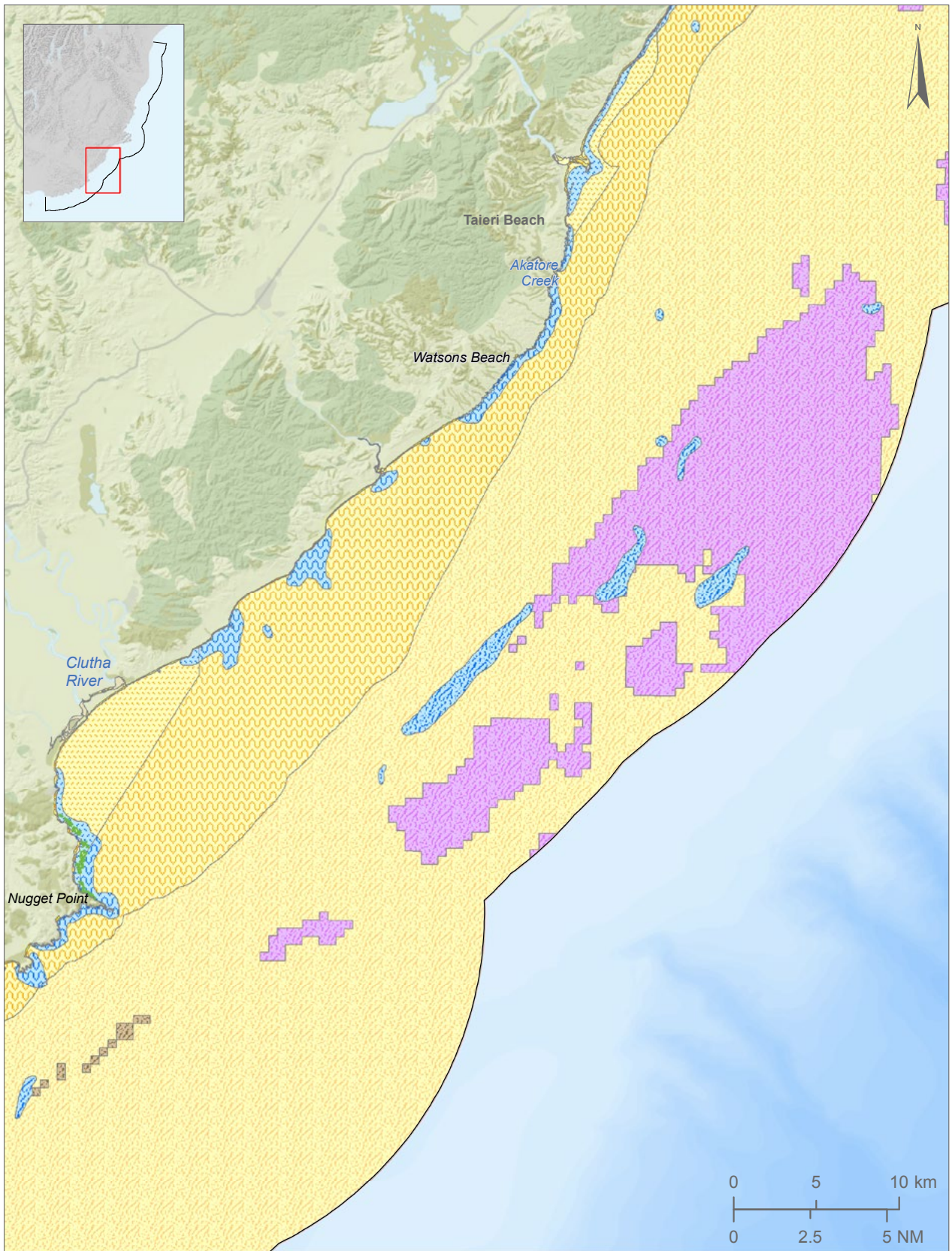


Figure A5-1: Classified habitat types of the Forum region (e)
 Clutha River

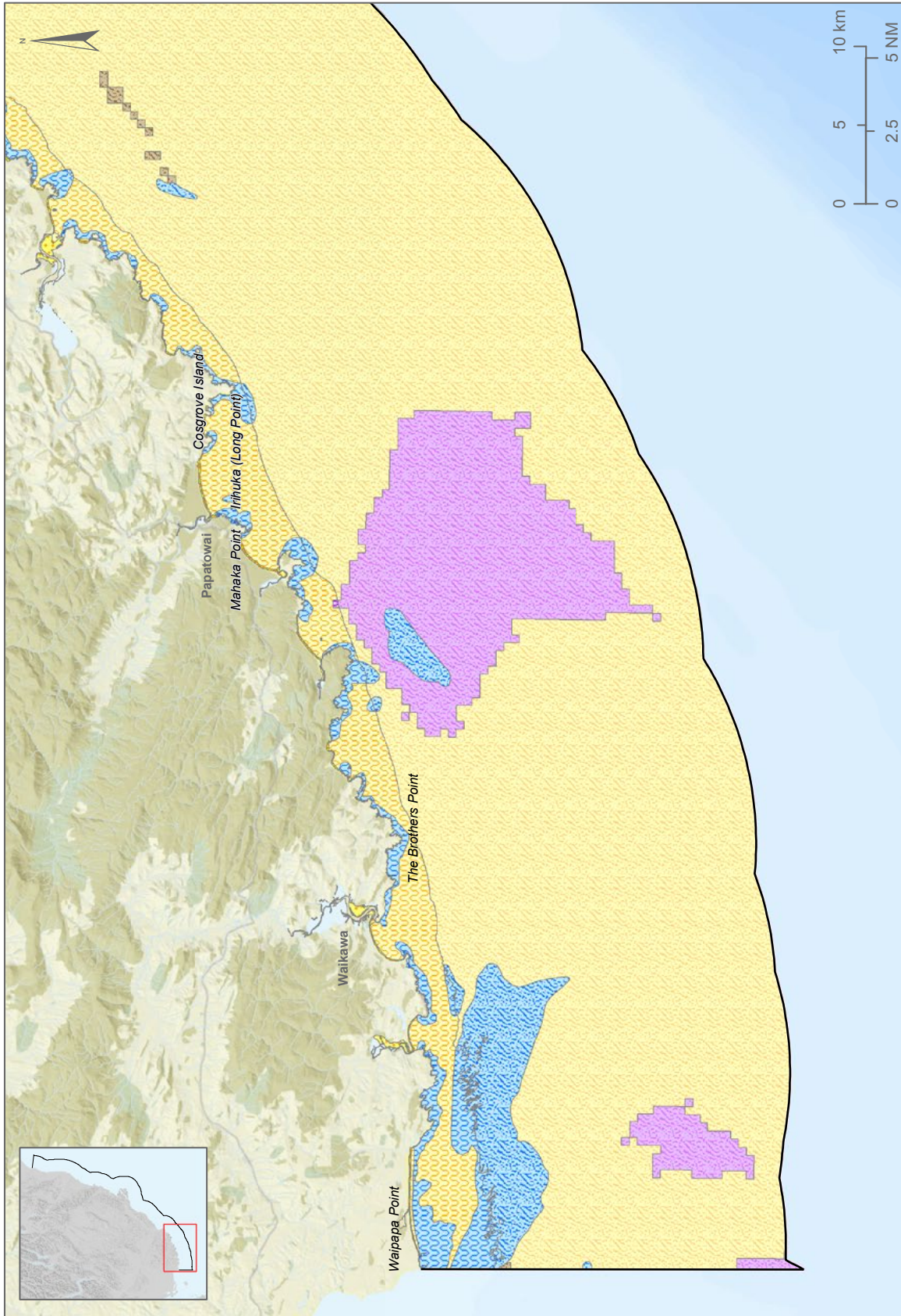


Figure A5-1: Classified habitat types of the Forum region (f)
The Catlins

APPENDIX 6: ADDITIONAL SUPPORTING INFORMATION

A6.1 Taonga Species Ngāi Tahu Claims Settlement Act Schedules 97 & 98

Reprinted as at
20 May 2014

Ngāi Tahu Claims Settlement Act 1998

Schedule 97

Schedule 97 Taonga species

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Birds

Name in Māori	Name in English	Scientific name
Hoiho	Yellow-eyed penguin	<i>Megadyptes antipodes</i>
Kāhu	Australasian harrier	<i>Circus approximans</i>
Kākā	South Island kākā	<i>Nestor meridionalis meridionalis</i>
Kākāpō	Kākāpō	<i>Strigops habroptilus</i>
Kākāriki	New Zealand parakeet	<i>Cyanoramphus</i> spp
Kakaruai	South Island robin	<i>Petroica australis australis</i>
Kakī	Black stilt	<i>Himantopus novaeseelandiae</i>
Kāmana	Crested grebe	<i>Podiceps cristatus</i>
Kārearea	New Zealand falcon	<i>Falco novaeseelandiae</i>
Karoro	Black-backed gull	<i>Larus dominicanus</i>
Kea	Kea	<i>Nestor notabilis</i>
Kōau	Black shag	<i>Phalacrocorax carbo</i>
	Pied shag	<i>Phalacrocorax varius varius</i>
	Little shag	<i>Phalacrocorax melanoleucos brevirostris</i>
Koekoeā	Long-tailed cuckoo	<i>Eudynamys taitensis</i>
Kōparapara or Korimako	Bellbird	<i>Anthornis melanura melanura</i>
Kororā	Blue penguin	<i>Eudyptula minor</i>
Kōtare	Kingfisher	<i>Halcyon sancta</i>
Kōtuku	White heron	<i>Egretta alba</i>
Kōwhiowhio	Blue duck	<i>Hymenolaimus malacorhynchos</i>
Kūaka	Bar-tailed godwit	<i>Limosa lapponica</i>
Kūkupa/Kererū	New Zealand wood pigeon	<i>Hemiphaga novaeseelandiae</i>
Kuruwhengu/Kuruwhengi	New Zealand shoveller	<i>Anas rhynchotis</i>
Mātā	Fembird	<i>Bowdleria punctata punctata</i> and <i>Bowdleria punctata stewartiana</i> and <i>Bowdleria</i>

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Name in Māori	Name in English	Scientific name
		<i>punctata wilsoni</i> and <i>Bowdleria punctata candata</i>
Matuku moana	Reef heron	<i>Egretta sacra</i>
Miromiro	South Island tomtit	<i>Petroica macrocephala macrocephala</i>
Miromiro	Snares Island tomtit	<i>Petroica macrocephala dannefaerdi</i>
Mohua	Yellowhead	<i>Mohoua ochrocephala</i>
Pākura/Pūkeko	Swamp hen/Pūkeko	<i>Porphyrio porphyrio</i>
Pārera	Grey duck	<i>Anas superciliosa</i>
Pateke	Brown teal	<i>Anas aucklandica</i>
Pīhoihoi	New Zealand pipit	<i>Anthus novaeseelandiae</i>
Pīpīwharau	Shining cuckoo	<i>Chrysococcyx lucidus</i>
Pīwakawaka	South Island fantail	<i>Rhipidura fuliginosa fuliginosa</i>
Poaka	Pied stilt	<i>Himantopus himantopus</i>
Pokotiwaha	Snares crested penguin	<i>Eudyptes robustus</i>
Pūtakitaki	Paradise shelduck	<i>Tadorna variegata</i>
Riroriro	Grey warbler	<i>Gerygone igata</i>
Roroa	Great spotted kiwi	<i>Apteryx haastii</i>
Rowi	Ōkārito brown kiwi	<i>Apteryx mantelli</i>
Ruru koukou	Morepork	<i>Ninox novaeseelandiae</i>
Takahē	Takahē	<i>Porphyrio mantelli</i>
Tara	Terns	<i>Sterna spp</i>
Tawaki	Fiordland crested penguin	<i>Eudyptes pachyrhynchus</i>
Tete	Grey teal	<i>Anas gracilis</i>
Tīeke	South Island saddleback	<i>Philesturnus carunculatus carunculatus</i>
Tītī	Sooty shearwater/Muttonbird/ Hutton's shearwater Common diving petrel South Georgian diving petrel Westland petrel Fairy prion Broad-billed prion White-faced storm petrel Cook's petrel	<i>Puffinus griseus</i> and <i>Puffinus huttoni</i> and <i>Pelecanoides urinatrix</i> and <i>Pelecanoides georgicus</i> and <i>Procellaria westlandica</i> and <i>Pachyptila turtur</i> and <i>Pachyptila vittata</i> and <i>Pelagodroma marina</i> and <i>Pterodroma cookii</i> and <i>Pterodroma inexpectata</i>

Name in Māori	Name in English	Scientific name
	Mottled petrel	
Tītītipounamu	South Island rifleman	<i>Acanthisitta chloris chloris</i>
Tokoeka	South Island brown kiwi	<i>Apteryx australis</i>
Toroa	Albatrosses and Mollymawks	<i>Diomedea</i> spp
Toutouwai	Stewart Island robin	<i>Petroica australis rakiura</i>
Tūī	Tūī	<i>Prothemadera novaeseelandiae</i>
Tutukiwi	Snares Island snipe	<i>Coenocorypha aucklandica huegeli</i>
Weka	Western weka	<i>Gallirallus australis australis</i>
Weka	Stewart Island weka	<i>Gallirallus australis scotti</i>
Weka	Buff weka	<i>Gallirallus australis hectori</i>

Plants

Name in Māori	Name in English	Scientific name
Akatorotoro	White rata	<i>Metrosideros perforata</i>
Aruhe	Fernroot (bracken)	<i>Pteridium aquilinum</i> var <i>esculentum</i>
Harakeke	Flax	<i>Phormium tenax</i>
Horoeka	Lancewood	<i>Pseudopanax crassifolius</i>
Houhi	Mountain ribbonwood	<i>Hoheria lyalli</i> and <i>H. glabata</i>
Kahikatea	Kahikatea/White pine	<i>Dacrycarpus dacrydioides</i>
Kāmahi	Kāmahi	<i>Weinmannia racemosa</i>
Kānuka	Kānuka	<i>Kunzia ericoides</i>
Kāpuka	Broadleaf	<i>Griselinia littoralis</i>
Karaeopirita	Supplejack	<i>Ripogonum scandens</i>
Karaka	New Zealand laurel/Karaka	<i>Corynocarpus laevigata</i>
Karamū	Coprosma	<i>Coprosma robusta, coprosma lucida, coprosma foetidissima</i>
Kātote	Tree fern	<i>Cyathea smithii</i>
Kiekie	Kiekie	<i>Freycinetia baueriana</i> subsp <i>banksii</i>
Kōhia	NZ Passionfruit	<i>Passiflora tetrandia</i>
Korokio	Korokio Wire-netting bush	<i>Corokia cotoneaster</i>

Name in Māori	Name in English	Scientific name
Koromiko/Kōkōmuka	Koromiko	<i>Hebe salicifolia</i>
Kōtukutuku	Tree fuchsia	<i>Fuchsia excorticata</i>
Kōwahi Kōhai	Kōwhai	<i>Sophora microphylla</i>
Mamaku	Tree fern	<i>Cyathea medullaris</i>
Mānia	Sedge	<i>Carex flagellifera</i>
Mānuka Kahikātoa	Tea-tree	<i>Leptospermum scoparium</i>
Māpou	Red matipo	<i>Myrsine australis</i>
Mataī	Mataī/Black pine	<i>Prumnopitys taxifolia</i>
Miro	Miro/Brown pine	<i>Podocarpus ferrugineus</i>
Ngaio	Ngaio	<i>Myoporum laetum</i>
Nīkau	New Zealand palm	<i>Rhopalostylis sapida</i>
Pānako	(Species of fern)	<i>Asplenium obtusatum</i>
Pānako	(Species of fern)	<i>Botrychium australe</i> and <i>B. biforme</i>
Pātōtara	Dwarf mingimingi	<i>Leucopogon fraseri</i>
Pīngao	Pīngao	<i>Desmoschoenus spiralis</i>
Pōkākā	Pōkākā	<i>Elaeocarpus hookerianus</i>
Ponga/Poka	Tree fern	<i>Cyathea dealbata</i>
Rātā	Southern rātā	<i>Metrosideros umbellata</i>
Raupō	Bulrush	<i>Typha angustifolia</i>
Rautāwhiri/Kōhūhū	Black matipo/Māpou	<i>Pittosporum tenuifolium</i>
Rimu	Rimu/Red pine	<i>Dacrydium cypressinum</i>
Rimurapa	Bull kelp	<i>Durvillaea antarctica</i>
Taramea	Speargrass, spaniard	<i>Aciphylla</i> spp
Tarata	Lemonwood	<i>Pittosporum eugenioides</i>
Tawai	Beech	<i>Nothofagus</i> spp
Tētēaweka	Muttonbird scrub	<i>Olearia angustifolia</i>
Tī rākau/Tī Kōuka	Cabbage tree	<i>Cordyline australis</i>
Tikumu	Mountain daisy	<i>Celmisia spectabilis</i> and <i>C. semicordata</i>
Tītoki	New Zealand ash	<i>Alectryon excelsus</i>
Toatoa	Mountain Toatoa, Celery pine	<i>Phyllocladus alpinus</i>

Name in Māori	Name in English	Scientific name
Toetoe	Toetoe	<i>Cortaderia richardii</i>
Tōtara	Tōtara	<i>Podocarpus totara</i>
Tutu	Tutu	<i>Coriaria</i> spp
Wharariki	Mountain flax	<i>Phormium cookianum</i>
Whīnau	Hīnau	<i>Elaeocarpus dentatus</i>
Wī	Silver tussock	<i>Poa cita</i>
Wīwī	Rushes	<i>Juncus</i> all indigenous <i>Juncus</i> spp and <i>J. maritimus</i>

Marine mammals

Name in Māori	Name in English	Scientific name
Ihupuku	Southern elephant seal	<i>Mirounga leonina</i>
Kekeno	New Zealand fur seals	<i>Arctocephalus forsteri</i>
Paikea	Humpback whales	<i>Megaptera novaeangliae</i>
Parāoa	Sperm whale	<i>Physeter macrocephalus</i>
Rāpoka/Whakahao	New Zealand sea lion/ Hooker's sea lion	<i>Phocarcetos hookeri</i>
Tohorā	Southern right whale	<i>Balaena australis</i>

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Part A Taonga fish species

Name in Māori	Name in English	Scientific name
Kāeo	Sea tulip	<i>Pyura pachydermatum</i>
Koeke	Common shrimp	<i>Palaemon affinis</i>
Kōkopu/Hawai	Giant bully	<i>Gobiomorphus gobioides</i>
Kōwaro	Canterbury mudfish	<i>Neochanna burrowsius</i>
Paraki/Ngaiore	Common smelt	<i>Retropinna retropinna</i>
Piripiripōhatu	Torrentfish	<i>Cheimarrichthys fosteri</i>
Taiwharu	Giant kōkopu	<i>Galaxias argenteus</i>

Part B Shellfish Species

Name in Māori	Name in English	Scientific name
Pipi/Kākahi	Pipi	<i>Paphies australe</i>
Tuaki	Cockle	<i>Austrovenus stutchburgi</i>
Tuaki/Hākiari, Kuhakuha/ Pūrimu	Surfclam	<i>Dosinia anus</i> , <i>Paphies donacina</i> , <i>Macra discor</i> , <i>Macra murchsoni</i> , <i>Spisula aequilateralis</i> , <i>Basina yatei</i> , or <i>Dosinia subrosa</i>
Tuatua	Tuatua	<i>Paphies subtriangulata</i> , <i>Paphies donacina</i>
Waikaka/Pūpū	Mudsnail	<i>Amphibola crenata</i> , <i>Turbo smaragdus</i> , <i>Zedilom spp</i>




A6.2 Te Tai o Arai Te Uru Statutory Acknowledgement







Figure A6-1: Map showing the area covered by the Statutory Acknowledgement

Legend for habitat maps

Management areas

-  Marine Reserve
 -  Type 2 MPA
 -  Forum region
-

Coastal habitats

-  Bryozoan known
-  Bryozoan most abundant
-  *Macrocystis*
-  Foul - Sand/Rock


Mud

-  Moderate Shallow Mud
-  Exposed Shallow Mud
-  Deep Mud
-  Deep Water Mud








Gravel

-  Sheltered Shallow Coarse Sand
-  Moderate Gravel Beach
-  Moderate Shallow Coarse Sand
-  Exposed Gravel Beach
-  Exposed Shallow Beach
-  Deep Gravel
-  Deep Water Gravel

Boulder

-  Exposed Boulder Beach

Reef

-  Sheltered Intertidal Reef
-  Sheltered Shallow Reef
-  Moderate Intertidal Reef
-  Moderate Shallow Reef
-  Exposed Intertidal Reef
-  Exposed Shallow Reef
-  Deep Reef

Sand

-  Sheltered Sandy Beach
-  Sheltered Shallow Beach
-  Moderate Sandy Beach
-  Moderate Shallow Beach
-  Exposed Sandy Beach
-  Exposed Shallow Beach
-  Deep Sand
-  Deep Water Sand

Estuarine habitats

-  Estuarine
-  Estuarine Boulder Beach
-  Estuarine Boulder Reef
-  Estuarine Cobble Beach
-  Estuarine Cobble Beach
-  Mud Flat
-  Estuarine Gravel Beach
-  Estuarine Gravel Field
-  Estuarine Intertidal Reef
-  Estuarine Reef
-  Estuarine Sandy Beach
-  Estuarine Sand Flat




**SOUTH-EAST
MARINE PROTECTION
FORUM**
ROOPU MANAAKI
KI TE TOKA