



Ocean Roadmap for New Zealand.

A Discussion Document: Towards a Healthy Ocean
and a Sustainable, Prosperous Ocean Economy

AUGUST 2023

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Disclaimer: The information contained in this Roadmap report is of a general nature and is intended for discussion purposes only. The report is derived from literature reviews and interviews, however, the views and opinions expressed in this document are those of the authors alone and do not necessarily reflect the official policy or position of any person or department within the organisations that are represented. Due to the early - stage nature of the ideas illustrated within the Roadmap report, there will inevitably be omissions. As feedback is received the Roadmap may be updated.

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Karakia

This karakia is a dedication for a waka, an ocean-going canoe, to remove any obstacles or difficulties that might be in the way of an important long voyage. It asks the various atua or gods associated with the sea to prepare the way, and for a clear path to be made across the waters, so that the waka might arrive safely at its destination.

Waerea, waerea nga tai moana
Waerea nga tai o Kiwa
Waerea, waerea nga tai nā Hinemoana
Waerea, waerea nga tai nā Tangaroa
Waerea, waerea nga tai nā Tāne Mahuta
Waerea, waerea nga tai nau e Tāwhirimatea

Takoto te ihi moana, takoto te ihi matawai
Takoto te ihi pūkohurangi, takoto te ihi wairangi
Ki au-ripo, ki au-tohorā, ki au-marino
Takoto atu te au-māuru, te au-whakarua,
te au-marangai
Te au-moana ki te pū, ki Hawaiki
Ki te pū, ki te Toi-whenua

Tenei au ka whakatakoto i te ihu o taku waka
Ki te rua o Tama-nui-te-Ra kia mau kita
Kita ki uta ki te Toi-whenua e

Whakahoro, whakahoro e Tāwhirimatea
Ki te pū, ki te māuru, ko Pou-tū,
ko Pou-takoto atu
Ki te Toi-whenua, ki Hawaiki

Kapi kapi o mata tonga
Waiho taua i te Ihonui o tai e
Maui O tai o Kupe, o tai o
Te Rango-pātahi
Koi keukeu, koi rangaranga e ī

Mitimiti tai maranga o Aotea
Mitimiti tai o te moana a Kiwa
Mitimiti tai a Hinemoana
Takaahoaho Tangaroa i tai-whenua
i tai-timu, i tai wawā, i tai wiwī e ī

Ka rere Tānekaha te waka-rei o Kahukoka
Ki te whanga, ki Hawaiki-nui, e oi ki uta e ī

Present day New Zealand is the emergent tip of the continent Zealandia, half of the size of Australia and stretching from New Caledonia in the north to beyond Campbell Island in the south and out to the Chatham Islands in the east.

Most of this eighth continent lies under water and is the fourth largest marine estate of the planet. This emergent tip is thought to have surfaced some 20 million years ago in the form of two main islands and numerous smaller islands. The collection of islands remained uninhabited by humans until the 13th century and the early migrations by peoples of the Pacific – accomplished mariners and navigators in their ocean-going vessels.



Sir Chris Mace KNZM

From these early migrations through to the present, the oceans that surrounded our shores have defined and indeed continue to define New Zealand as a maritime nation.

Within this vast estate, stretching from the tropics to Antarctica, resides a significant portion of the world's marine biodiversity along with many unique species of seabirds- some of which breed exclusively in New Zealand's maritime environment. Tragically a number of these species, marine mammals and targeted fish species are in serious decline. The reasons for this decline are many and the implications are significant—not only for New Zealand, but globally. As a nation, we must look to reverse this trend and establish new policies and practices that not only support more sustainable harvest of our precious marine resources, but also protect those species that are most vulnerable.

As Charles Royal succinctly states: "It's time to acknowledge that the destiny of humans is inextricably linked to the destiny of our planet and the natural world. We are not superior to the natural world – we are part of it."

The oceans that surround our small island nation are critical to our wellbeing on so many fronts. From influencing our climate and weather patterns to providing security and isolation from intruders to providing shipping lanes and contributing to our economy. It is our marine estate that gives our country global significance, with this significance comes both opportunity and responsibility.

The challenge laid down by John Martin, 2nd Admiral RNZN (Retired) as well as the key recommendations outlined in this Roadmap speak to much needed next steps: "What we need is a unified and coherent approach to articulate how we should manage our relationship with the ocean, balancing our national identity, environment, economic, security, legal and recreational concerns with our responsibility for stewardship." John Martin

This Ocean Roadmap initiative, courageously initiated by Rebecca Mills and inspired by Sir Rob Fenwick is a crucial step forward. It is my hope that by bringing disparate groups together and outlining an early vision for action, that the Roadmap can create the momentum necessary for the change we need: meeting John Martin's and Charles Royal's challenge, living in greater balance with our remarkable seascape, and ultimately creating health and wealth for generations to come.

A handwritten signature in black ink, appearing to be 'Chris Mace'.

– Sir Chris Mace

Aotearoa New Zealand is home to a critical swath of the world's ocean. This seascape is essential to the ecological health of thousands of key species, the livelihoods of our people, the strength and security of our economy, a source of whakapapa, and the capacity of our environment to adapt to and mitigate the effects of climate change.

Yet this extraordinary treasure is experiencing biodiversity loss; its potential is underexplored; and we lack the strategic coordination necessary to oversee current and future uses.

This Ocean Roadmap was developed to respond to this challenge. It is a collective effort, guided by diverse contributors, with the goal of beginning to make sense of how we can, together, approach an aspirational collective vision for New Zealand's ocean estate. Specifically, it was developed to:

1. Listen to the stories of the past while embracing new ideas for the future.
2. Provide insight into the building blocks and enabling conditions required to secure ocean health and wealth for generations to come.
3. Identify a set of opportunities and actions that if advanced could help New Zealand shift towards a future of sustainable protection and production that addresses the urgent risks of climate change and loss of biodiversity.

At this turning point in history, we have an opportunity and obligation to build a more equitable, resilient, knowledge-based and prosperous future that is in harmony with nature. Our maritime space defines us as a nation; the reality is that we are a small island nation at the bottom of the world surrounded by a huge marine estate. New Zealand holds legal rights over an exclusive economic zone (EEZ) of 4 million square km of ocean, the fourth largest in the world. In all, New Zealand is responsible for a large proportion of the world's marine environment. This tells us that not only are we not too small to make a difference, on the contrary, we have a pressing responsibility to act.

Managing New Zealand's marine environment is not an easy task. Its size and diversity—of habitats, uses and stakeholders—all present real complexity. Adding to this complexity, New Zealand's marine sector is governed by a wide range of agencies with no single entity coordinating efforts, and no explicit overarching strategy with which to guide decision making.

Fortunately, Aotearoa New Zealand has a history of tackling hard, complex challenges and innovating in the face of complexity.

Throughout this Roadmap, we have underscored that managing this vast asset will require foresight, sound science and Mātauranga, strategic use and conservation of precious natural capital and a deep commitment to making tangible progress. We have also underscored that if we come together and make those commitments, the opportunities for impact are vast.

We invite others to join our call to action:

We as New Zealanders share a collective opportunity and responsibility to protect and restore the ecological health of our ocean, acknowledging its intrinsic value while building an ocean economy that can provide nutritious food, empower whānau and communities, and provide innovative solutions to our most urgent challenges.

By taking up this opportunity we are building resilience to support us and our marine environment both now and over the long term.

It is our intention that the Roadmap will catalyse a new conversation and begin to identify targeted actions, providing a platform and an invitation for others to join efforts to secure ocean health and wealth for generations to come.

Summary of Key Recommendations:

The analysis presented within this Roadmap is intended to catalyse further dialogue, identify potential opportunities, and begin to move us, together, toward a collective vision and ultimately toward collective actions.

If we are to have a productive dialogue and move into that collective future, we believe three building blocks will be key: a new narrative and mindset focused on opportunity not just challenges; forward looking ambition; and bold leadership willing to take big steps. With those in place, and building on the initial opportunities that have emerged in this Roadmap, truly transformative actions are possible.

To facilitate action, we believe two important steps are necessary. First, we recommend resourcing an independent entity—the New Zealand Ocean Initiative—to facilitate, convene and implement future collaborative work in this space. Second, we believe this entity is best placed to, in consultation with stakeholders, co-develop an Oceans Strategy for Aotearoa New Zealand which confirms goals, commitments and optimises solutions across protection, production, prosperity and wellbeing.

While the scope of this Strategy would be set by the new entity, in addition to helping to understand enabling building blocks the Roadmap has unearthed a set of opportunity pathways, outlined below, which we think will be important in a national strategy document.

Ocean Literacy, Data and Knowledge.

A focus on narrowing scientific gaps in the marine space, better education and knowledge of the ocean and its ecosystems, together with better access to data, will enable industry, central and local government and civil society to make better informed decisions.

Ocean Health: Conservation and Restoration.

We are truly privileged to be stewards of a rich and diverse seascape. Reducing its biodiversity loss is a global and national environmental imperative to avoid ecosystem collapse. It also happens to make economic sense. Without ocean health, there is no ocean economy.

Advancing Carbon Capture and Storage. The ocean plays a major role in regulating climate, and can be both a source and sink of carbon. Developing the next generation of projects that understand and leverage the marine-climate connection—including how best to store and preserve blue carbon—can accelerate our nation’s climate adaptation and mitigation goals.

Evaluating Ocean-based Renewables.

Investment in technology development and demonstration projects in green shipping, offshore wind and more have the potential to advance ocean-based renewable energy—building key economic sectors and reducing national emissions.

The Premium Opportunity of Sustainable Business.

Consumers are looking for higher social and environmental standards in what they buy and what they consume. Investing in and expanding sustainable marine enterprises represents a major opportunity for New Zealand businesses.

Story Telling: Demonstration Projects. Aotearoa

New Zealand is already innovating and leading in many key areas—from the Gulf Innovation Fund Together (GIFT) to the Kaikōura Marine Guardians. Central to the path forward will be showcasing and learning from what is already working well.

Innovative Financing: Priming the Pump. Both in New Zealand and globally we are seeing a shifting financial landscape with corporate and philanthropic players increasingly looking at the social and environmental consequences of their investments. Exploring innovative financing models has the potential to support marine restoration and leverage synergies with land-based opportunities to generate positive outcomes for people, planet and profit.

Mitigating Maritime Security Risk. Our remoteness reinforces the importance of a robust maritime security system to support access to global supply and value chains. Meanwhile, competition for fishing resources in the near Pacific, the Southern Ocean and even within our EEZ is being compounded with international interest in undersea assets. Increasingly, geopolitical and climate change pressures will threaten our marine space and require a focus on protecting NZ’s food, maritime and environmental security into the future.

This is just a snapshot of the potential opportunities explored in this Roadmap for how we might better, together, protect and manage the vast natural capital in our marine environment and create collective outcomes for people, economies, and natural ecosystems alike.

History tells us that people may hold different values and come from different positions on the use and conservation of ocean and coastal ecosystems. To help distil a pathway forward in what is undeniably a complex landscape, we’ve sought to firstly listen to understand diverse perspectives. We see this listening and research driven approach as a first step to understanding opportunities and a potential pragmatic and unifying pathway forward. It’s our hope that through this initial piece of work we can highlight, in even a small way, just what is possible when we weave collective ideas together.

Given the urgency of current challenges and the breadth of future opportunities, doing nothing is simply not an option. What we need most of all is commitment across public and private sectors and political will. The risks of doing nothing are too high, our ocean is not too big to fail, and it is not too big or complex to fix. But it is too big and central to our future to ignore.





Summary Roadmap: Agenda for Action

Towards a Healthy Ocean and a Sustainable, Prosperous Ocean Economy

We believe this Ocean Roadmap for New Zealand identifies the building blocks of change and a platform to support wider discussions on how we best move forward, together.

Throughout this document we have underscored that although the challenges are complex, creating a healthy ocean and a sustainable and prosperous ocean economy will require foresight, sound science (including Mātauranga), strategic use and conservation of precious natural resources and a deep commitment to making tangible progress. Given the urgency of current challenges and future potential opportunities, doing nothing is simply not an option. This is the moment to come together.

It is our hope that this Roadmap will accelerate cross-sector conversations and catalyse the political will necessary to lead on this issue.

We invite you to join this ‘Call to Action’ to secure New Zealand’s ocean health and wealth for generations to come.

As we have stressed throughout this report, it will take collective action to make this vision a reality. If you would like to be a part of this effort moving forward, or have feedback on this Roadmap, please direct thoughts and comments via support@theleverroom.com

In addition to acknowledging all contributors below, we would like to firstly acknowledge the significant contribution of the late Sir Rob Fenwick whose passion, drive and interest in the restoration of New Zealand's ocean estate were the major catalyst to this work. Devastated by the continuing decline of Aotearoa's marine estate, he endeavoured to amplify the efforts however his time was cut short.

Rebecca Mills had the privilege to share conversations with Sir Rob, which sparked her to consider how best to frame and catalyse the approach, as presented in this report.

Over the past 30 years a number of others, including and notably Sir Chris Mace, John Martin, Pete Hodgson, Dr Bill Ballantine, Hon Sandra Lee, Hugh Logan, Bill Mansfield, Cath Wallace, Barry Weeber, Dame Anne Salmond, Raewyn Peart, Dame Catherine Tizard and Dr Morgan Williams have also advocated for a more strategic, overarching approach to how New Zealand manages our marine space. Wherever possible we have sought to acknowledge these significant contributions at the relevant time within the text of this document.

We are indebted to many contributors and partners who contributed time assisting the project team in bringing this Roadmap and first phase of work to completion. As lead author Rebecca Mills on behalf of the project team, is particularly grateful for the review and input of early drafts by the following contributors.

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Organisations are listed for identification purposes only.

Advisory Panel:


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A vast, deep blue ocean under a clear sky. Numerous seabirds, likely albatrosses, are scattered across the water. Some are in flight, their wings spread wide, while others are swimming or splashing. The birds are mostly dark on top and lighter on the bottom. The water has a slight ripple, and the overall scene is one of a busy, natural marine environment.

New Zealand begins with the sea and ends with the sea. Understand this and you will comprehend New Zealand and the New Zealander. The thundering surf is our frontier. And our only guards, gulls and migratory birds. With justice, then, the Polynesian voyagers called the land Tiritiri o te Moana – the gift of the sea.

Maurice Shadbolt & Brian Brake 1963, p. 25

Our

Part 01

Call

to

Action

We as New Zealanders share a collective opportunity and responsibility to protect and restore the ecological health of our ocean, acknowledging its intrinsic value while building an ocean economy that can provide nutritious food, empower whānau and communities, and provide innovative solutions to our most urgent challenges.

By taking up this opportunity we are building resilience to support us and our marine environment both now and over the long term.

It is our intention that the Roadmap will catalyse a new conversation and identify targeted actions, providing a platform and an invitation for others to join efforts to secure ocean health and wealth for generations to come.

Purpose of this work

In both Aotearoa New Zealand and around the world we are seeing signals that the journey towards a sustainable future for our oceans has already begun, with pioneers leading the way.

While there are many complex and urgent challenges, new sustainability focussed technologies are attracting investors and there is growing interest across sectors and communities in how we might better, together, create collective outcomes for people, economies, and natural ecosystems alike. The relatively new creation of the Oceans and Fisheries portfolio also arguably signals the Government's commitment to a more holistic, integrated approach to managing our oceans. With the announcement of a multi-agency approach¹ we see an opportunity to support efforts, along with other marine ecosystem partners, to secure ocean health and wealth for generations to come.

History tells us that people may hold different values and come from different positions on the use and conservation of marine ecosystems. To help distil a pathway forward in what is undeniably a complex landscape, we've sought to firstly listen to understand diverse perspectives. We see this listening and research driven approach as a first step to understanding opportunities and a potential

pragmatic and unifying pathway forward. It's our hope that through this initial piece of work we can highlight, in even a small way, just what is possible when we weave collective ideas together. Given what's at stake, this Roadmap was conceived to:

1. Listen to the stories of the past while embracing new ideas for the future.
2. Provide insight into the building blocks and enabling conditions required to secure ocean health and wealth for generations to come.
3. Identify a set of opportunities and actions that if advanced could help New Zealand shift towards a future of sustainable protection and production that addresses the urgent risks of climate change and loss of biodiversity.

Approach

This Roadmap was developed with the intention to listen and capture the views of a diverse and thoughtful group of New Zealanders who, together, are already aspiring to a future of collective prosperity and protection.

It was our humble aspiration to look and listen to the past to inform the future in our approach to this mahi.

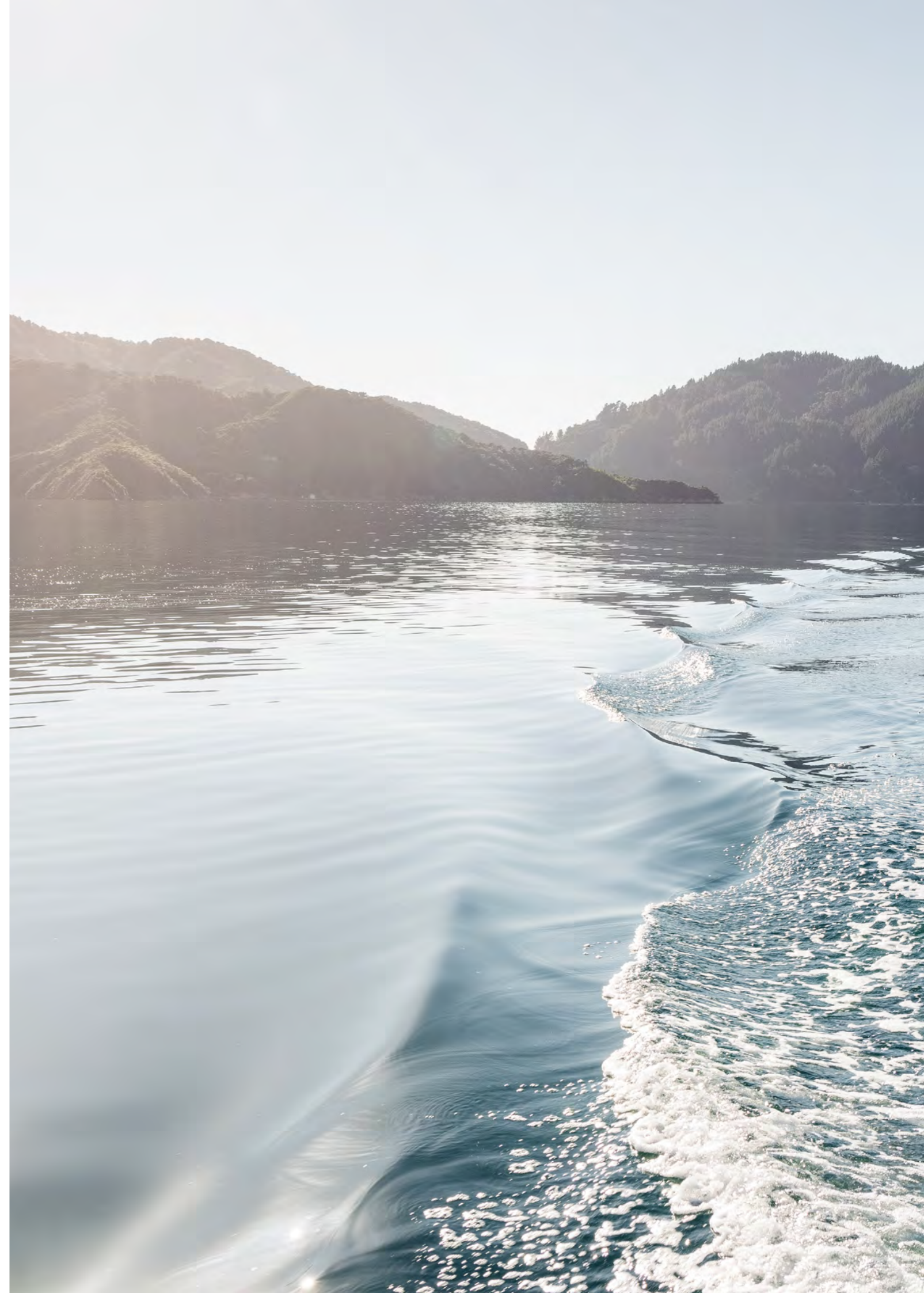
Practically speaking this meant drawing knowledge from Māori history, documenting, referencing and building on previous research, while also undertaking new research. Throughout this document we also acknowledge and welcome recent work of the Office of the Prime Minister's Chief Science Advisor, Sustainable Seas National Science Challenge, The Environmental Defence Society, WWF New Zealand The Aotearoa Circle, Live Ocean, Koi Tū: The Centre for Informed Futures, the Blue Cradle Foundation and the office of the Parliamentary Commissioner for the Environment who are each also moving forward the collective conversation in various ways.

God gave us two ears and one mouth, so we ought to listen twice as much as we speak.

Author: -Irish Proverb-

We explicitly sought to listen to many voices to reflect the wide diversity of perspectives, including from the public sector, research institutions, investment and finance, industry, Māori organisations, as well as philanthropy and non-governmental organisations. This cross sectoral approach to the interviews enabled the project team to develop a holistic picture of opportunities within the New Zealand context. Interviews were semi-structured conducted via a guided discussion based around several key themes rather than a rigid questionnaire format.

This Roadmap was partly written as New Zealand sought to limit the impact of Covid-19. The Covid-19 pandemic has continued to highlight the interconnections between human and planetary health and the need for nations to work together to respond to global threats. In this context, we have an opportunity and obligation to build a more equitable, resilient, knowledge-based and prosperous future that is in harmony with nature.



Our

Island
Nation:

Part 02

Situational
Context

Te Moana-nui-ā-Kiwa, the Pacific Ocean, was one of the last areas of the earth to be explored and settled by human beings. It was only around 3000 years ago that people began heading eastwards from New Guinea and the Solomon Islands further into the Pacific. Great skill and courage was needed to sail into the unknown across vast stretches of open sea.

According to many tribal narratives, Kupe was the first Pacific explorer to discover the islands of New Zealand. Stories about his exploration on his canoe, the *Matawhaorua* or *Matahorua*, differ from region to region but often feature a fight with a great wheke (octopus). Many New Zealand place names, preserved by later generations of Māori people, recall his journey.

Marbled by drifts of cloud, the Pacific covers almost a third of the earth's surface... The ancestors of Māori invented blue-water sailing... Their explosive migrations ... were made possible by a navigation system based on deep knowledge of the sea. Dame Anne Salmond, "Tears of Rangī"

Across New Zealand and around the world today people have personal deep connections to the ocean. For many people living in coastal communities, the ocean is not only a source of food and livelihoods, but also an intrinsic part of our culture and heritage.

We are a country surrounded by the ocean and it's one of the most incredible gifts we have.

Tom Hishon

New Zealand is an island nation with stewardship of an ocean and ocean floor twenty-one times larger than its emerged land area - our land and cultures are surrounded by one of the planet's largest marine EEZ per capita. New Zealand's marine environment encompasses the territorial sea and the EEZ, as well as the seabed of the continental shelf extending beyond the EEZ. New Zealand's marine space spans the subtropics to the subantarctic with islands to the north, south and east far beyond its two main islands. The shelf environment includes broad plateaus, narrow shallow and wide deep shelves incised with submarine canyons and a steep continental slope leading to the abyssal plains.

New Zealand holds legal rights over an EEZ of 4 million square km of ocean and the fourth largest in the world, with an average depth of 2.4 km. That works out to be around 2.3 cubic km of water for each resident, or about one million Olympic swimming pools' worth of seawater for each person.²

New Zealand ratified the 1982 United Nations Convention on the Law of the Sea (UNCLOS) in 1996. In accordance with the Convention, New Zealand exercises sovereignty over its territorial sea, sovereign rights over its continental shelf and, within its EEZ, sovereign rights for the purposes of exploitation of living and non-living resources as well as jurisdiction over the establishment and use of artificial islands, installations and structures, marine scientific research and environmental protection. Specifically, Article 192 references the obligation to protect and preserve the marine environment, while Article 193 references the sovereign right to exploit natural resources pursuant to environmental policies and in accordance with the duty to protect and preserve the marine environment.

Aotearoa New Zealand's government also has obligations under Te Tiriti o Waitangi which established a partnership in sovereignty between the Crown (represented by government) and Māori. The three guiding principles of the Treaty are partnership, participation and protection.

Managing New Zealand's marine environment is not an easy task in part because of its size and diversity. The ocean is a large, interconnected ecosystem, yet while we have acknowledged the importance of an ecosystem-based approach we currently have no explicit over-arching strategy with which to manage it.

The Ocean's Critical Role

The ocean provides a wide variety of vital benefits and intrinsic values, many of which our contributors noted are often overlooked and inadequately quantified.

This is somewhat surprising given many New Zealanders' love affair with the sea. In many ways the ocean defines our way of life in New Zealand, it determines our climate and is essential to our way of life.

While some benefits are easy to see and quantify in financial terms, others are sometimes hidden from view, such as habitat for a vast number of species, the metaphysical and cultural values of tangata whenua, the recreational experiences of a large proportion of New Zealanders, and the vital ecosystem services provided by the marine environment gas regulation (CO₂/O₂), acting as a source or sink for heat, waste treatment, nutrient cycling, and habitats.

While the value of natural environments is often measured in biodiversity and biomass, these are of incalculable value, largely because they cannot be reconstructed when gone. Acknowledging the intrinsic value of our natural realm is also important for many New Zealanders.

Ecological and Human Health

Of equal but often overlooked importance, oceans provide a source of awe, wonder and inspiration the world over. Marine biodiversity is among the great taonga (treasures) of Aotearoa New Zealand with as much as 85% of New Zealand's indigenous biodiversity found in the sea. Over half of our 17,000 reported species are endemic, which means they are only found here. This includes over 6,000 known species of invertebrates, and hundreds of seaweeds and fish. A unique feature of New Zealand's waters is the diversity of habitats, with over 50 habitat types in our coastal regions alone, each supporting different species. This is important as from the perspective of ecological science, the first principle of resilience is biodiversity – that is, the variability among living organisms within a particular ecosystem.

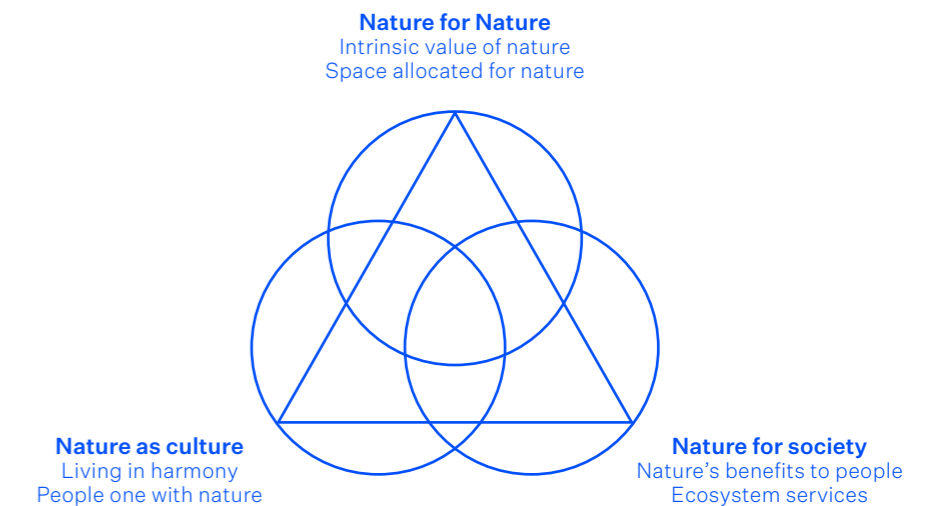
The ocean plays a critical role in sustaining and harbouring a stunning array of life, much of it still unknown to science.

The ocean plays a critical role in the health of our planet and ultimately human survival. The ocean is important for long-term human health, providing a critical source of protein and key nutrients, including omega-3 fatty acids and iodine. Our oceans also hold 97% of all our water, occupy more than 70% of the Earth's surface and 95% of the biosphere.⁴

Coastal habitats, such as mangroves, provide protection for hundreds of millions of people, detoxify pollutants flowing off the land, and provide nursery areas for fish, increasing the supply of food and providing livelihoods and rich, vibrant habitats. The ocean also absorbs more than 90 percent of the heat resulting from anthropogenic greenhouse gas emissions⁵. It produces 50–80 percent of Earth's oxygen.

Overall, there is an increasing awareness among New Zealanders that the natural environment is fundamental to their wellbeing.⁶ For Māori as discussed elsewhere in this Roadmap, there is no compartmentalisation of human wellbeing and the environment, they are one and the same, where the whakapapa of people extends to non-human kin groups, including inanimate entities such as the land and the seas.

Different frames of value are visually captured by the Nature Futures Framework, a heuristic developed by researchers in the scenarios and models expert group of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. The framework builds on three of the main values of nature: intrinsic values (nature for nature), instrumental values (nature for society) and relational values (nature as culture).



Climate Regulation

The ocean influences climate via a variety of pathways and processes.

Large-scale regulation of global temperature occurs through the absorption and transport of heat by a process known as thermohaline circulation. As opposed to wind-driven currents and tides, thermohaline circulation is that part of the ocean circulation which is driven by density differences (which depends on temperature and salinity).

Importantly, much of the world's carbon is stored in the oceans, with the deep ocean containing the largest pool of carbon on the planet, of more than 38 000 gigatons (1 gigaton = 1 billion tons), which is 16 times as much carbon as the terrestrial biosphere.⁷ Closer to home, estimates based on mapping of surface-dissolved CO₂ indicate the New Zealand EEZ CO₂ sink is an order of magnitude greater than that of New Zealand forests.⁸

According to the United Nations Intergovernmental Panel on Climate Change, since 1970 the oceans have absorbed over 90 percent of excess heat trapped in Earth's climate system. This warming is now causing significant changes in currents and sea levels, which affect the health of marine species, nearshore and deep ocean ecosystems, as well as weather systems across the globe. Both New Zealand's Aotearoa Circle and NIWA are currently investigating climate impacts on the health of our marine species.

The role of the ocean in regulating the earth's climate is essential but fragile, and woefully underappreciated. It underscores the need to make supporting the ocean's natural ability to restore itself a key priority as we seek solutions for living with climate change.

Customary and Cultural Value

Te moana, the coast and oceans of Aotearoa New Zealand, are central to our identity and intertwined with our history.

Kō ngā tahu ā ō tapuwai inanahi, hei taurira mō āpōpō. Sir Ian Taylor shares that in the Māori world view it is our past that always lies in front of us "The footsteps laid down by our ancestors centuries ago, create the paving stones upon which we stand today."

In te ao, the Māori world-view, te moana is a source of whakapapa. Whakapapa is a cultural reference used to connect Māori to the environment. Spiritually this reflects a relationship to the atua (gods) who are the personification of these environmental realms.⁹ Whakapapa therefore dictates a genealogical link back to the natural environment where all creatures including humans and all plants and natural resources are descendants of the first family, the atua born of Ranginui and Papatūānuku, the sky and the earth. Tāne an elder child is present in forests and birds; Tangaroa, whose realm is the ocean and waters and whose children are the fish and other sea creatures is a younger brother in one account and the initial partner to Papatūānuku in another account reflecting the close relationship between land and sea. Tangaroa is a significant character, the story surrounding Tangaroa offers a Māori understanding of ocean and water ecology. Tangaroa exists as the personification of sustenance

and maintenance of life given the domain of Tangaroa covers a large majority of our world.¹⁰ Other stories, like those of Hinemoana an Ocean Maid, reinforce this message. Thus, human life and marine life are connected through the kinship of the atua. This entails special responsibilities and the obligations of whanaungatanga, involving respect and the duty to take good care.

The whakapapa that connects people to the environment is seen as reciprocal: "The relationship between people and the physical environment is not one of permissible domination, exploitation, and exacting claims on sections of the land because of an assumed superiority of human consciousness and toil; quite the opposite. In te ao Māori, the environment is respected and engaged as kin, an ancestor, an elder in the hierarchy of genealogical time and space, acknowledged as both a spiritual and physical being whose needs and preferences trump those of humanity because it was here first."¹¹

In te ao Māori the mauri, or life force, of a healthy moana enhances the mauri of those who interact with it. Customary fisheries are also a right of tangata whenua with fishing taking place in rohe moana (defined customary fishing areas).

Current and yet to be discovered Commercial Resource

Globally the blue economy, if compared to a national economy, would be the seventh largest in the world, and the ocean as an economic entity would be a member of the G7.¹² Coral reefs alone contribute \$11.5 billion a year to global tourism, benefitting more than 100 countries and providing food and livelihoods to local people. WWF has valued ocean assets at \$24 trillion while also noting the intrinsic value of all species, the value of which is incalculable.

Further to its role as a social, cultural and ecological asset, New Zealand's marine space is also an economic asset containing yet to be discovered medical, human health and commercial resources.

Closer to home, in the year ended March 2017, the marine economy contributed an estimated \$7 billion to New Zealand's economy.¹³ This contribution includes both direct and indirect contributions (from further economic activity in non-marine industries as a result of marine economy activity). Categories which are currently measured for their financial contributions are:

- offshore minerals
- shipping
- fisheries and aquaculture
- marine services
- marine tourism and recreation
- government and defence.

Making things more complicated, many of these categories are interdependent and cannot be valued in isolation of the others. In addition to the broad work of Statistics NZ, several studies have been completed in New Zealand on the value to regions and localities of ecotourism and the wider economic benefits associated with marine mammals, pelagic birds, and marine protected areas. Overall there is opportunity to gain a finer level of insight of our marine ecotourism industry—its key drivers as well as its social, economic, cultural and environmental impacts.

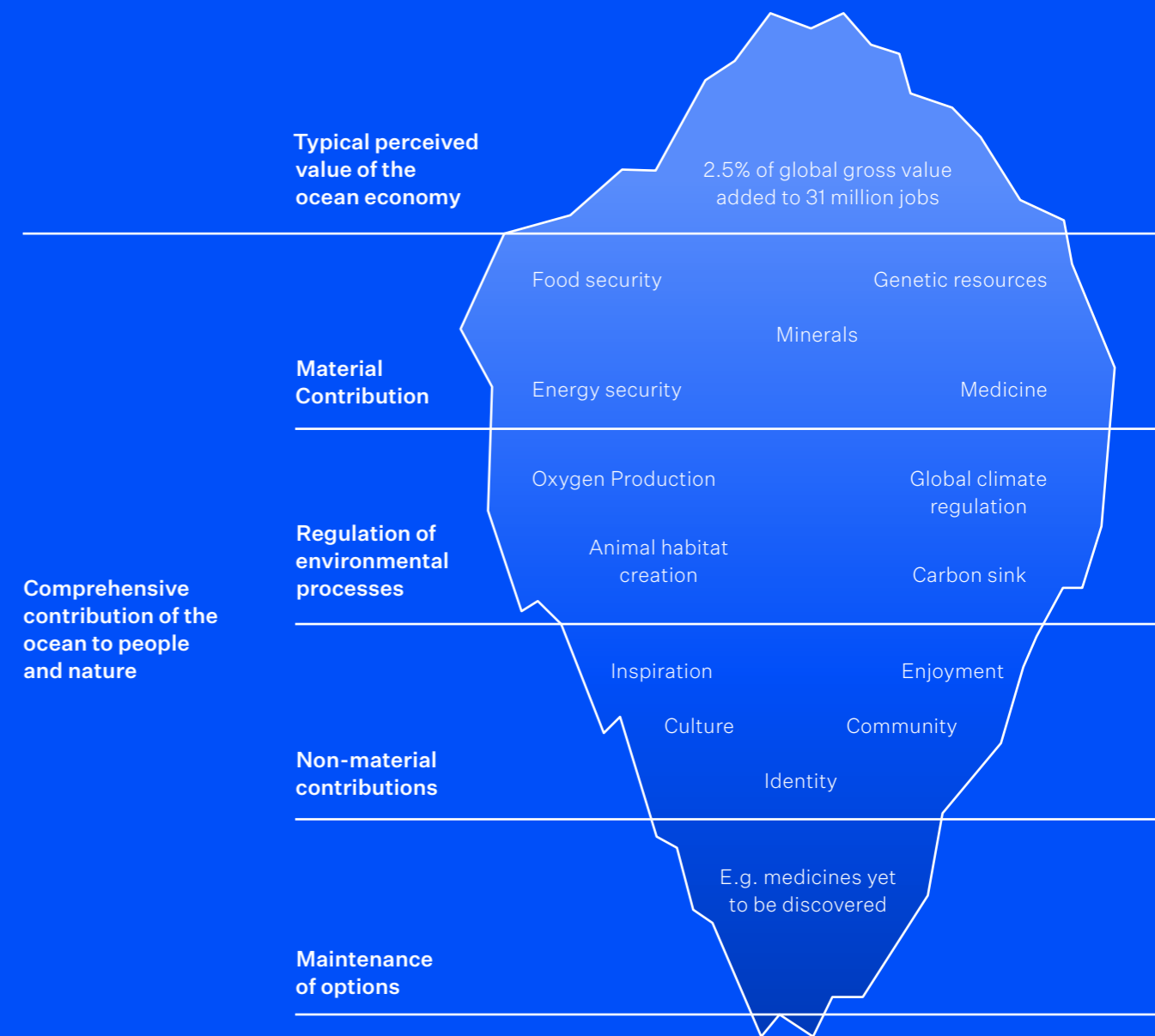
Turning to Aotearoa's seafood sector (fishing and aquaculture), three large companies (Sanford, Talley and Sealord), together with Moana New Zealand (at roughly 5% of the sector) contribute roughly half of total production and revenue.¹⁴ These firms are fully integrated, owning quota, operating fishing vessels and aquaculture farms, processing catch/harvest, owning brands and export licences and distributing to market. Another 25%

is contributed by ten medium sized enterprises.¹⁵

Māori are significant contributors to New Zealand's marine economy with interests in wild fisheries, aquaculture, marine tourism, and non-market customary harvest. Roughly 35% of total income generated is controlled by Māori enterprises at iwi, hapū or whānau scale.¹⁶

Finally, while new offshore oil and gas has been halted in New Zealand, GNS Science The Centre for Advanced Engineering and NIWA have been studying New Zealand's offshore mineral resources and gaining an understanding of their economic value. GNS Science estimates that seafloor mineral deposits within New Zealand's EEZ could be worth up to \$500 billion (while noting, however, any attempt to value marine mineral resources at this stage is speculative, as additional exploration is required to define these resources). Some contributors to this work have highlighted the scale of this potential opportunity, noting that a focus on high value resources with precision extraction techniques could be a significant opportunity for New Zealand, if it could be achieved in a sustainable way while retaining rents locally. Other contributors and global multilaterals such as IUCN have highlighted the risks of destabilising ocean ecosystems and have suggested the intrinsic long-term benefits of a healthy ocean outweigh any short-term incentives offered by deep seabed mining.

In summary and as illustrated in the figure, the contributions of our oceans are significant and they play a critical role, although this is not always seen and recognised.





Challenges to be Collectively Solved

As highlighted earlier, Aotearoa New Zealand is an island nation with jurisdiction over a large and valuable marine domain.

This important space is also at the centre of conflicting uses, environmental degradation, and threats of species extinctions. While there is much to understand about the nature of our challenges, they can be broadly characterised as follows:

- Decreasing abundance and biodiversity: Listening to the Science and our History
- Multiple enactments containing outdated legislative provisions
- Future of fishing
- Lack of institutional co-ordination

Decreasing abundance and biodiversity: Listening to the Science and our History

The Science

Aotearoa New Zealand, like other countries around the world, is facing the twin crises of climate change and biodiversity loss. These crises are profoundly interrelated. Climate change contributes to biodiversity loss through the disruption of ecosystems.¹⁷ Because New Zealand’s marine environment provides a unique and accessible laboratory for research, there’s international interest in undertaking marine science in the country. New Zealand’s state of the environment was assessed in a joint report by the Ministry for the Environment and Stats New Zealand “Our Marine Environment 2022”.¹⁸ It describes biodiversity decline and environmental degradation.

Aotearoa New Zealand is considered the seabird capital of the world. Yet, according to the ‘Our Marine Environment’ report published in 2022 by the Ministry for the Environment, 90% are threatened or at risk of extinction. It’s staggering. Sally Paterson

As we lift our gaze to the global landscape, the direct footprint of human activity is visible almost everywhere. Recent systematic analysis of marine wilderness recently published in the journal *Current Biology* showed only a small fraction, about 13 percent, of the world’s ocean can still be classified as wilderness.¹⁹ The remaining marine wilderness is unequally distributed and found primarily in the Arctic, in the Antarctic, or around remote Pacific Island nations. The study also shows that less than 5 percent of global marine wilderness is currently protected. Most of this is in offshore ecosystems, with very little protected wilderness found in high-biodiversity areas such as coral reefs.²⁰

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services IPBES estimates that globally ‘more than 40 percent of amphibian species, almost a third of reef-forming corals, sharks and shark relatives, and over a third of marine mammals are currently threatened with extinction.’²¹ This is the result of a variety of threats, including overfishing, which disproportionately removes predators, which are replaced by shorter-lived and smaller species, and the food chain becomes much simpler, less dynamic and less resilient.

Turning to the impact of climate change, marine heatwaves are an increasing factor that will impact on coastal environments and marine industries and also have some influence on land based climate effects like fires and cyclones. The 2019 IPCC report *The Ocean and Cryosphere in a Changing Climate* estimates that climate-induced declines in ocean health will cost the global economy US\$428 billion per year by 2050 and \$1.98 trillion per year by 2100.²² These numbers are said to encompass costs associated with declines in ocean health and services due to climate-change, overfishing, excessive nutrient loads and plastic pollution. The pressures associated with biodiversity loss, activities on land, our activities at sea, and climate change have many effects on coasts and oceans. These can interact and lead to cumulative effects.

There is growing concern that when these pressures increase beyond a certain tipping point, the interconnected ocean system will no longer function as a complex and rich ecosystem, or be able to provide the benefits people want and need. Indeed, contributors to this Roadmap noted that in the 1970s overfishing reduced natural predators of kina, propagating urchin barrens—like deserts among forests of kelp. Today crayfish are functionally extinct in the Hauraki Gulf, and urchin barrens cover many reefs²³ demonstrating trophic cascade.

Stories and Songs from the Sea

The sea has provided kai moana and subsistence across multiple generations. Isotope studies have shown that about 90% of all food energy consumed by Chatham Island Māori was of marine origin (including fish, shellfish and sea mammals), 61% at a coastal site at Wairau Bar, South Island.²⁴ Early European explorers in the nineteenth century also made observations on the abundance of fish and fishing activity and its importance to Māori, while missionaries and settlers provide anecdotal comments on the local abundance and availability of some fish species. The coastline “swarmed with excellent fish and crayfish; the rocky and sandy shores abounded with good shellfish;...all choice eating.”

The traditional Māori conception of the North and South Island were as ‘gifts of the deep, gifts of the ocean’. This is because the North Island is Te Ika-a-Māui (Māui’s fish) and the South Island is Te Waka-o-Māui (Māui’s waka). As shared by contributor Charles Royal, this points to the centrality of the ocean in traditional Māori perspectives on the nature of these islands and land. Everything comes from the sea.

In recent decades there has been an increasing number of oral history projects recording the relationships between hapū, communities and the sea. New Zealand’s much celebrated yachtsmen from Sir Peter Blake to Peter Burling have also recounted their observations.

Speaking with media²⁵ on a recent round the world experience, sailor Peter Burling was asked to share if he had any scary moments:

The thing that scared me most was what I didn’t see. We talked to people who had done the Ocean Race in the past, and not just the recent past but quite early days, and some of the recordings of Blake going around the world, and you are just expecting to see massive marine life ... a lot of whales, a lot of albatrosses. I could count the number of whales I saw when I was going around the world

on one hand. I was scared by the lack of albatrosses, especially in the South Pacific. I did not really see any tuna jumping.

Talking to people that have done the race, the change between now and then (the early editions of the race), has been absolutely incredible.

The truth is most of us are not as connected to the stories of our seas and can’t remember the former abundance, or what has been lost. To bolster this former knowledge, the experiences of our pioneer divers, fishers and residents of the Hauraki Gulf have been captured in the story telling platform “Songs of the Sea”, supported by New Zealand Geographic and Live Ocean. Stories described in *Songs of the Sea*, include memories from Sue Neureuter who grew up visiting the Noises Islands, just north of Waiheke and has witnessed the decline in marine life and seabird population first-hand. Other voices include Keith and Ailsa Lewis, pioneer divers from the 1960s, as well as wisdom from marine advocate Wade Doak and kaumatua Laly Haddon.

Over New Zealand’s recent Covid-19 lockdown WWF also gathered ocean tales shared by the public and created animated stories to highlight how our ocean has changed over only one person’s lifetime. New Zealanders such as Gregory O’Brien have shared their own stories through their writing. In the book ‘Always Song in the Water’ Gregory suggests how New Zealanders might be re-imagining ourselves as an oceanic people on a small island in a big piece of water. The significance of understanding the issues we face through memories of past abundance was highlighted by many contributors, including chef Tom Hishon:

We have taken our oceans and way of life for granted and we now realise the memories of a thriving ocean are a distant memory. We need a new game plan.

Multiple Enactments Containing Outdated Legislative Provisions

While Aotearoa New Zealand has a vast and resource-rich marine estate, our current legal framework is complex and fragmented.

Contributors noted it has been developed over 50 years into a patchwork of piecemeal provisions. Given the way it's evolved over time, oceans governance is specifically fragmented across 25 statutes, 14 government agencies, across seven spatial jurisdictions, and numerous regional, local and community-based authorities.²⁶

While the challenges facing New Zealand's ocean estate are similar to other maritime countries, no coherent national strategy exists to support optimal economic, social, cultural and environmental outcomes. Instead, agencies manage various activities under different laws, management regimes and decision-making processes which are not always well integrated. There are also multiple pieces of overlapping marine legislation and some significant gaps in coverage. The regulatory context is complicated further by the fact that management of the oceans is linked to management on land and the raft of 'one off' specific purpose laws that impose specific approaches, exclusions or regulations in spatially defined areas. This makes it difficult to manage the complexity of interacting pressures and conflicting uses. As the government has said "It doesn't provide a clear sense of outcomes or a framework for making decisions when those conflicts arise."²⁷

Over 20 years ago, in 2000, New Zealand initiated a process for the creation of a National Oceans Policy. This initiative followed similar developments in Canada, Australia and elsewhere, and was intended to respond to a recommendation of the Parliamentary Commissioner for the Environment in 1999 that New Zealand should develop an oceans strategy. Despite significant

investment in the process and public consultation, the initiative was suspended in 2003 and, although re-started in 2005, was effectively abandoned in 2008 following a change of government.²⁸

In the years since 2008, a number of individuals including Sir Rob Fenwick, Sir Chris Mace and John Martin have highlighted the opportunity arising from an overarching oceans strategy and common vision. More recently both The Environmental Defence Society (EDS) and contributor to this project Karen Scott, (University of Canterbury) have published work in support of the development of an oceans strategy. The broader focus of recent EDS work aims to conceptualise options for an oceans management system, noting that planned resource management reform does not obviate the need for wider ranging oceans reform. Further work which focuses on asking fundamental, future-focused questions about how our overall package of laws, institutions and interventions is due to be released by EDS in 2024.

How can we bring our marine environment forward as we look to overhaul our legislation? How do we best ensure we achieve the right balance for the commons of the oceans while being mindful of interests? Julie Hall

How to achieve the right balance is a really important question and reflects the tension that only a comprehensive oceans strategy can address.

Future of Fishing

A number of contributors commented on the diverse perspectives from commercial, recreational and customary fishers.

These diverse perspectives must be integrated into the broader discussion of how together we create collective outcomes for people, economies, and natural ecosystems alike.

As part of his review of our environmental reporting systems, the Parliamentary Commissioner for the Environment commented that: *Current fisheries management systems... rarely take into account the effects of fishing on the wider ecosystem.*²⁹ The Ministry for the Environment's 2022³⁰ view is that the sustainability of fishing levels is impossible to gauge. Earlier in 2017 The Nature Conservancy highlighted that while Aotearoa New Zealand's Quota Management System has ranked well compared to other countries against a range of global indicators, New Zealand doesn't routinely report on the ecosystem impacts of fishing.³¹

Significant work has also recently been carried out by the Prime Minister's Chief Science Advisor Professor Dame Juliet Gerrard and her Office, in the 2021 publication of the report on Commercial Fishing. At the outset of the report, Dame Juliet acknowledges that science advice on commercial fisheries won't solve all of the problems faced by an increasingly challenged marine environment. Solving these problems 'will need people to work together on a system change, as partners not adversaries.' Her report makes a range of recommendations across the need for clear oceans leadership and strategy, taking a connected world view, improving regulatory tools, data systems, research and innovation, and taking an ecosystem approach to fisheries management.³² The report recommends taking immediate, evidence-based action for the benefit of all New Zealanders including commercial, recreational and customary fishers.

Lack of Independent Institutional Coordination

Globally, ocean-related institutions have been established to support the development of ocean-based sectors. This development has often been assessed against conventional measurement metrics like sector revenues (or GDP) or number of jobs.

While Te Ara Paerangi Future Pathways is a multi-year programme focused on the future of New Zealand's research system, formal institutional and cross-sector coordination is currently said to remain rare, making cross-sectoral communication and planning difficult.

Only 22 countries³⁹ have been identified as systematically assessing the efficient, safe and symbiotic use of the ocean's resources—its power generation, biological productivity, carbon sequestration and so on. While in New Zealand the marine sector is governed by a wide range of agencies there is no single entity currently coordinating management of our whole marine environment. Contributors to this report noted the need for higher levels of systematic assessment of interdependencies and mapping of the opportunities, so we can have informed debate and make optimised decisions to support highest value opportunities.

We have to have the confidence and trust that we have the difficult conversations, to drive debate and to make the hard decisions. How might we create the space and inspire New Zealanders to have bigger conversation about values rather than rights?
Shelley Campbell

While a number of contributors noted that there is some co-ordination through New Zealand's central government Marine Hub, further benefits could be gained through independent exchange of data and practices. Formal co-ordination through an independent institute has the potential to support positive outcomes for New Zealand, while providing resources for education, collaboration and considered dialogue. Such an Institute could also support coordination of New Zealand's obligations and commitments under international treaties.



Building blocks of change:

Part 03

Navigating towards Collective Solutions

Internationally there is growing momentum to enable sustainable and prosperous ocean economies (increasingly referred to as “blue economies”), as seen at meetings of the Ocean Panel, UN Ocean Conference, Our Ocean, World Ocean Summits, UN Decade of Ocean Science and so on. Within New Zealand, we are also seeing growing commitment to find solutions that will support the country over the longer term. However, for New Zealanders to fully harness opportunities to shift towards a sustainable and prosperous ocean economy, contributors to this Roadmap have advocated that new ways of thinking, leading and measuring success will be needed to support the transition.

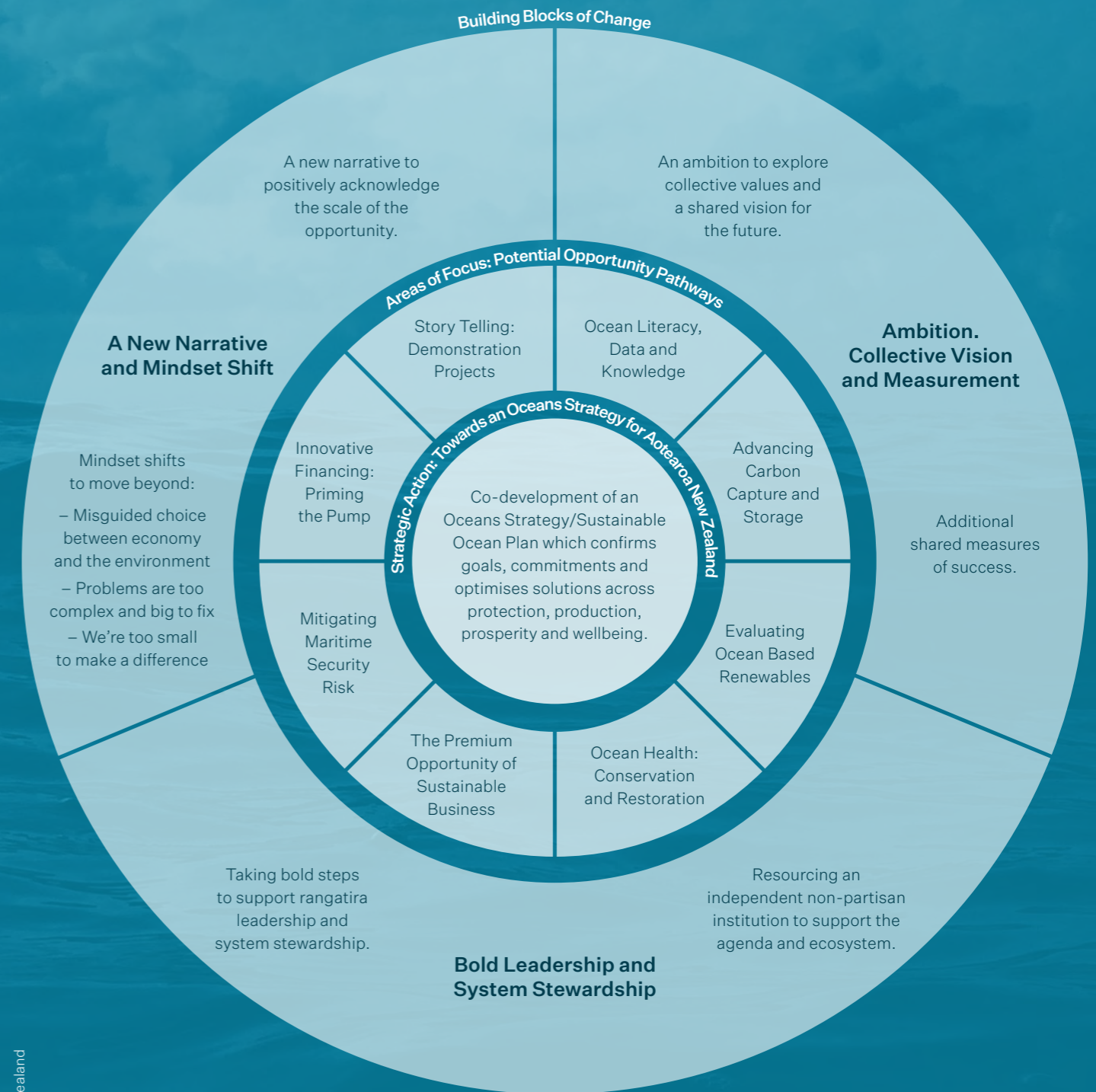
We need to get key players in the room together and work towards formulating a shared vision and a common set of goals and objectives. This isn't just about challenges, it's also about the potential for innovation. Jane Taylor

This research has further highlighted the diversity of values and potential needs for various stakeholders and groups across Aotearoa New Zealand. To move forward together, there is a need to first develop the enabling conditions for change, that is the foundational building blocks, before honing in on high leverage focus areas and exploring opportunities for action. To do that and help navigate towards collective solutions we propose a shared and pragmatic ‘Agenda for Action’. Further details on what we see as the building blocks for change, and initial thinking on the areas of opportunity and kinds of actions we believe we can usher forward, together, are detailed across the remainder of this document in both Part 3 and Part 4.

This is the beginning. This work is intended to share back what we have heard so far, to excite and inspire, and to begin to align us in the work ahead, which will include further development of these ideas and how best to put them into practice.

Summary Roadmap: Agenda for Action

Towards a Healthy Ocean and a Sustainable, Prosperous Ocean Economy





A new Narrative and Mindset Shift

One of our biggest levers in the creation of ocean health and wealth for generations to come is to take the opportunity to re-examine what we fundamentally believe to be true.

It's time to acknowledge that the destiny of humans is inextricably linked to the destiny of our planet and natural world. We are not superior to the natural world, we are part of it. Charles Royal

Embracing te ao Māori

“Ko ahau te moana, ko te moana ko ahau – I am the ocean and the ocean is me.”

Māori have a well-established set of values that govern relationships between people, and between people and the natural world. In Māori terms, all living things are the descendants of Ranginui (the “Sky Father”) and Papatūānuku (the “Earth Mother”) and are thus related through whakapapa. Te ao māori (Māori world view) does not separate people and nature, they are one and the same. Te Ao māori is premised on Mātauranga Māori (Māori knowledge systems) which encompasses not only what is known but how it is known and includes Māori cultural world views, language, principles and practices.

Te ao Māori is about the reciprocal relationship between people and nature. What does it mean to actually give more than we take from our oceans? Where are we at today? Naomi Aporo

I can’t see how we can have a sustainable future for our oceans when we don’t know how much we are taking out – otherwise it’s all theory. Tā Mark Soloman

Placing Māori values and concepts at the centre allows knowledge systems to coexist. Mātauranga Māori when combined with Western knowledge, offers us unique insights and opportunities to do things differently in the way we look after our whenua and moana (land and sea).

How do we be guided by principles that provide mana to Māori?

Naomi Aporo

Principles rooted in Kaupapa Māori include but are not limited to:

- Kaitiakitanga: commonly translated as guardianship, for Māori it is a positive obligation to apply local knowledge to environmental decision-making
- Whanaungatanga: relationships with and caring for one’s family, extended family and community
- Manaakitanga: relationship building through welcoming and extending hospitality to neighbours and visitors
- takahe-utu-ea: the principle of compensation that restores balance where there have been breaches of tikanga (e.g. between competing commercial and tikanga imperatives)
- tapu and noa: an approach to resource management that endeavours to achieve a balance between people and the environment, the human and divine, and use and restriction on use.

Misguided choice between Economy and Environment

Several commentators noted that the current discourse of trade-offs and conflict between economy and our environment is so normalised that it is accepted without thinking.

Given we now have demonstrable models and ventures which optimise across both economy and environment we might also realise that coming to judgements and making wise choices need not be understood as a technocratic process of trading-off. Today we have the opportunity to create integrated approaches that multisolve for financial, ecological and cultural outcomes.

We have already seen examples of how conflicting interests between building our economic prosperity and protecting our unique marine environment might play out in

the future – in the tidal energy project at Kaipara for example, or the oil exploration of the east coast. These conflicts highlight, more than ever, the need for a strong well-defined and integrated National Oceans Strategy to inform policy development and guide how our marine environment is researched, managed and used. Sir Chris Mace³⁴

To make a shift towards a sustainable and prosperous future for our Ocean we have the opportunity to optimise for cultural, societal, economic and environmental protection.

Problems are too Complex and Big to Fix

While it’s true that the ocean’s problems are real, we are optimistic that action has started to take place to solve them.

Quite simply, even though the benefits of solving our current issues are numerous, they are not currently seen by all and so what we need is the collective motivation to solve them. Contributor Alex Rogers has clearly articulated this issue:

The benefits of solving many of our current issues are muted, while the potential costs to individuals are large. This means we need to think about a collective vision and the benefits of restoring past abundance we could get back.

What we need is commitment across public and private sectors and political will. The risks of doing nothing are too high, our ocean is not too big to fail, and it is not too big or complex to fix. But it is too big and central to our future to ignore.

The more we learn about the ocean, the more we see that it is central to improving the health, wealth and wellbeing of people. It holds the answers to the most pressing challenges facing humanity, including climate change and food security. It is time to shift our thinking and see it as an essential part of the solution to global challenges.

We're too Small to make a Difference

“A dominant narrative is that New Zealand is a small country and what we do doesn't make a positive difference on the world stage. New Zealand is not a small country, through our marine space it's responsible for a large chunk of the planet.” Craig Stevens

New Zealand's marine environment is both one of the largest and most unique in the world. We are not too small to make a difference.

We are the stewards for one of the largest areas of ocean on the planet
Bronwen Golder

We have the fourth largest Exclusive Economic Zone in the world- more than 400 million hectares of diverse marine environment. New Zealand's right to over a further 1.7 million square kilometres of seabed on the extended continental shelf was

confirmed by the United Nations in 2008, following extensive survey work by NIWA, along with GNS Science and Land Information New Zealand. We have right of sovereignty over the Ross Dependency, an area 14 times our land mass, and our marine responsibilities stretch even further afield. This tells us that not only are we not too small to make a difference, on the contrary, we have a pressing responsibility to act.

We have the ability to be a much larger voice. Geoff Ross



Ambition: Collective Vision and Measurement

“How can we balance the conversation to move into a future of aspiration and opportunity, not just focusing on the burning platform? How do you make this a win-win-win-win?” Shelley Campbell

We have a large ecologically diverse maritime estate. A number of contributors pointed to the need to better align the various activities underway, and better scale up our ambitions to meet the scale of the opportunity. Collective aspirations for the health and wealth of generations to come are needed to harmonise perspectives and bring all voices to the table.

Why isn't New Zealand embracing an ambitious collective vision. Why are we standing back? Without ambition we simply can't progress. We are fighting over the how without having agreed our level of ambition. Sally Paterson

To be able to move forward together, stepping into the waka together so to speak, we need a collective vision and view of success. Linked to a collective view of success is the need for shared measurement based on long term thinking.

As a country we need to be asking, what sort of 'return' do we actually want? And over what time horizon? We need space to be able to actually discuss these issues.

Geoffroy Lamarche

Some contributors highlighted the opportunity of a national vision:

We need a vision. We need to be ambitious. We need to have a 'Predator Free' for our ocean.

Bronwen Golder

Others spoke of the need to also combine shared visions:

We need to combine shared visions and understand perspectives from a community level – these will be different across the country. It's important to hear from communities that live near the sea.

Rochelle Constantine

Updated Measures of Success

Progress for the ocean economy is often focused on production indicators such as contribution to gross domestic product.

In Aotearoa New Zealand, we have the opportunity to provide a more holistic evidence base that goes beyond a single indicator of production to reflect the full cultural, societal, ecological, and economic value of the ocean.

We need to think more strategically about value. Rochelle Constantine

We have an opportunity—an imperative, really—to capture the ocean's broader value. One option worthy of further consideration is the production of a national set of ocean accounts to guide decision-making, integrated into economic development strategies. Globally there is a growing movement towards capturing the full value of ocean assets. This is seen to be critical to guide the sustainable development of ocean industries.

Across New Zealand there are a number of initiatives already underway to improve decision making by redefining and measuring all value, for example:

- We are seeing advances in the digitalisation of the ocean, in particular the development of the Digital Twin of the Ocean as a component of the Destination Earth initiative and the Seabed 2030 initiative which seeks to map the entire seafloor at unprecedented resolution by 2030.
- Mauri indicator approaches are emerging out of Māori ontology and epistemology and provide effective science-grounded models for determining the health and abundance of ecosystems, and their constituent human and non-human communities.
- Together both the Living Standards Framework and He Ara Waiora provide domains for assessing wellbeing.

Before advancing further work in how we best measure full value it will be important that all known efforts in this space are mapped, so we don't inadvertently reinvent the wheel.

Bold Leadership and Systems Stewardship

“The key is collective leadership to lead debate and decision outcome, together.” Jeremy Helson

While the challenges are great, there is growing appetite to navigate through them and towards collective solutions. Contributors to this work pointed to the connection and importance of ‘wayfinding’ where wayfinding refers to the techniques used by travellers over land and sea to find relatively unmarked and often mislabelled routes.

Navigation towards collective solutions, through a mindset shift, shared strategy and measurement would benefit from rangatira leadership. Traditionally a rangatira was the chief and figurehead for an iwi/hapū. Their role was one of mana and prestige but essentially one of responsibility for the wellbeing and protection of their people within the iwi. Decisions were made by chiefs and the people of that iwi worked towards iwi/hāpu goals as a collective (kotahitanga). The chief was responsible for his iwi, but they were only as strong as the collective strengths of each individual in that rōpū.

Rangatira is closely associated with Māori leadership. It speaks to the importance of weaving, raranga, a group, tira, together. Another explanation describes the light and illuminates the path. In Aotearoa we have the opportunity to take our place in the vanguard of change and fully become, individually and also collectively a beacon of light³⁵. Chellie Spiller, Ngāti Kahungunu ki waiora

Modern-day descriptions of ‘rangatiratanga as leadership’ revolve around notions of bringing people together, creating a vision, and communicating collective impact clearly. Rangatiratanga has connections to ‘systems stewardship’ which will be a critical enabler to achieving a sustainable, resilient ocean economy.

An Independent Institution for support

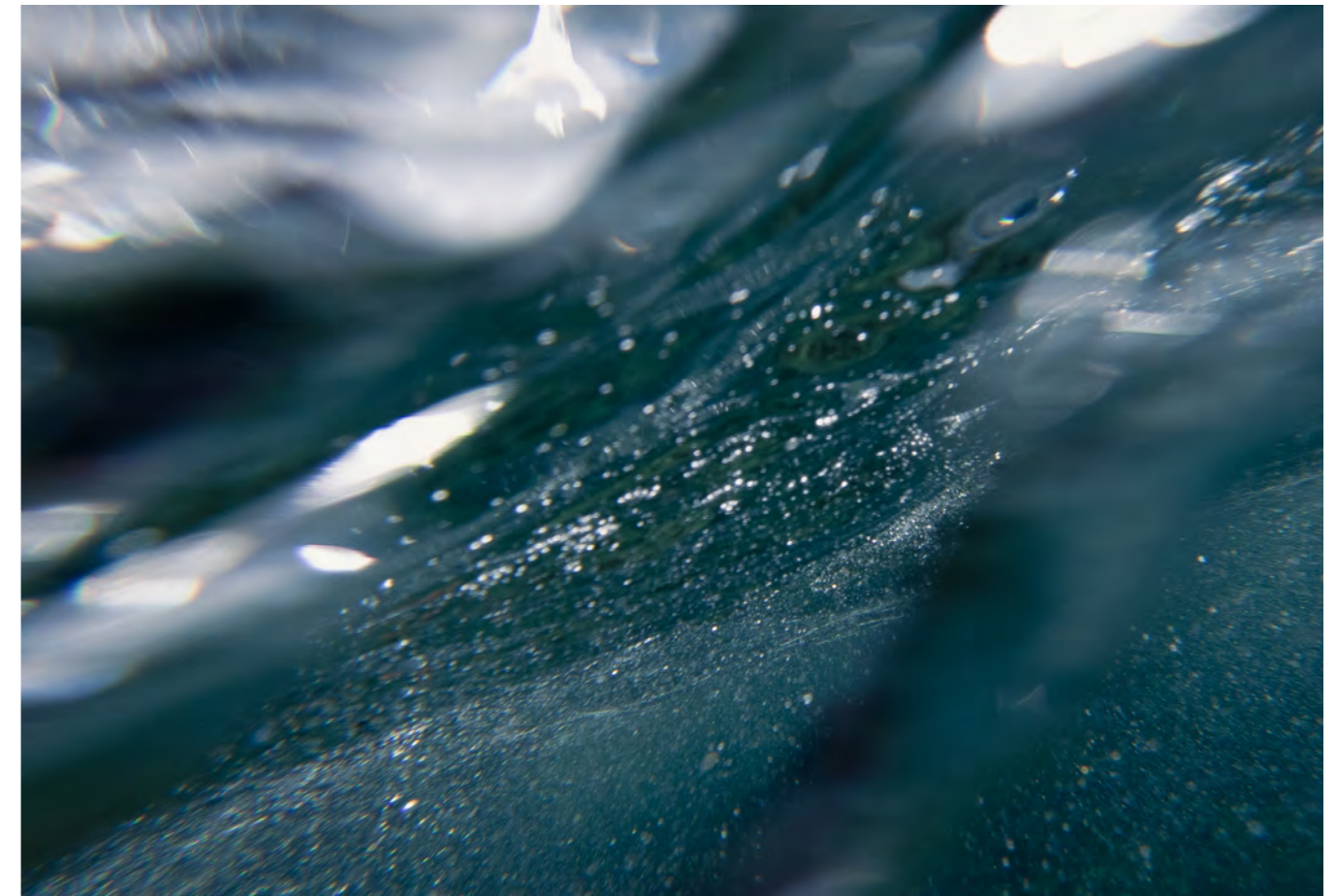
“We need to look after our own backyard. How do we best get all of the groups together?” Geoff Ross

To practically support bold leadership and systems stewardship we recommend that consideration be given to resourcing a backbone institution to move forward a pragmatic action agenda. This model (of enabling a small independent backbone institution to support collective efforts) is now utilised regularly globally and locally, including recently by both the Waikato Wellbeing Project, The Southern Initiative and The Aotearoa Circle.

The model used by the Aotearoa Circle to initially support the Sustainable Finance Forum and

ultimately lifting out Toitū Tahua, the Centre for Sustainable Finance provides a helpful case study and precedent. We see opportunity to utilise a similar model and development pathway, whereby The Lever Room has catalysed early efforts, to initially support the New Zealand Ocean Initiative.

Over time, the **NZ Ocean Initiative** could itself be resourced and funded in an ongoing way and lifted out and up as an independent Institution. We welcome further discussion on this proposed model with all ecosystem partners.



Ocean Roadmap for New Zealand

Areas of Focus:

Part 04

Potential
Oppportunity
Pathways

“What role do we want the oceans to play in the future of Aotearoa New Zealand, its wellbeing, its wealth and its relationship with the rest of the world?”

John Martin

In assessing priority focus areas, the nature and scale of current challenges indicates that a systems approach is needed. By taking a systems approach we have the opportunity to maximise positive outcomes while minimising unintended ones. As pointed out by a number of contributors, this is not just about minimising risk but also about capturing opportunity. The good news is that pragmatic solutions are already being implemented, albeit not always in this country or at the scale needed.

The pathways below are listed as a portfolio of ideas or opportunities, which amongst others provide a useful starting point for future discussion. These pathways would be further explored and tested in the process of developing an overarching strategy. Contributors to this work have noted that the process of developing an overarching strategy for our oceans provides an opportunity for direct users of the ocean (fishers, shippers, energy producers and beach lovers, among others) as well as policymakers, governments, businesses and communities—to work together to achieve the same outcome of a healthy, productive ocean.

We can't have something so high level its redundant – but we don't want so much detail its unworkable. A strategy doesn't have to be something that sits on the shelf. Geoffroy Lamarche

Strategic Action: Towards an Oceans Strategy for Aotearoa New Zealand

“What we need is a unified and coherent approach to articulate how we should manage our relationship with the ocean, balancing our national identity, environment, economic, security, legal and recreational concerns with our responsibility for stewardship.” John Martin

Over the course of this work, it became clear that the term strategy means different things to different people. Contributor John Martin and the project delivery team supports the following definition by UCLA Professor of Strategy Richard Rumelt: *a coherent response to an important challenge. Unlike a standalone decision or goal, a strategy is a cohesive set of analyses, concepts, policies, arguments, and actions that respond to a high stakes challenge.*

For New Zealand the development of an Oceans Strategy or ‘Sustainable Ocean Plan’ (a term a number of countries are embracing) also provides opportunity to develop a genuine process of co-governance with tangata whenua: enhancing treaty settlement outcomes, incorporating matāuranga Māori and tikanga Māori alongside science, environmental concepts and principles as well as goals relating to economic opportunities.

Overseas they are having much bigger and bolder conversations. At some point we have to bite the bullet and get this done. We are a maritime nation of 5 million people, which presents a quite extraordinary opportunity.

Shelley Campbell

Everyone says this is a contested space, but is it really? We have overlapping values and everyone wants abundance, we just need to agree how to get there.

James Frankham

While international experience has demonstrated that integrated ocean governance is challenging, contributor Karen Scott has noted that without a national overarching instrument setting out goals and principles of application to all ocean sectors, it is unlikely that meaningful ecosystem-based and integrated management will be achieved. New Zealand’s Office of the Prime Minister’s Chief Science Advisor has also made a recommendation to develop an Oceans Strategic Action Plan via a co-design process with iwi in her recently published report³⁶.



We need to have more honest conversations and to have discussions as a nation. Māori want to be involved. Tā Mark Solomon

A number of contributors spoke to the fact that careful navigation in this space was needed and that the development of any ocean strategy needed to be held gently. In New Zealand we have an advantage of being able to draw on mātauranga and also the experience from others such as Australia, Canada, the UK while referencing previous collective values and principles outlined in previous attempts. Over the past decade, New Zealand's EDS (Environmental Defence Society) has also produced a series of extensive reports on such fisheries and ocean policies adding further resource to be drawn on.

Through the course of this research we have observed growing consensus on the utility of an overarching oceans plan or strategy to:

- Articulating a shared vision, with supporting collective goals and actions.
- Promote an ecosystem-based approach to stewardship
- Establish a spatial framework that optimises use of marine space and resources
- Attract investment support for the development of a high-value sustainable marine economy that provides wellbeing benefits
- Safeguard the long-term health and resilience of the ocean and benefit of coastal communities.

In addition to the above, many contributors noted that robust science will continue to be needed and will play a critical role in guiding and informing any overarching plan or strategy. If New Zealand does this well, we have the potential to deliver positive economic and biodiversity conservation outcomes, as well as deliver on climate change mitigation and adaptation goals.

Contributor Julie Hall highlights that any approach in Aotearoa New Zealand needs to embrace ecosystem based management because that brings together the social, ecological, economic and co-governance all together. It is an opportunity to

assess interdependencies and cumulative impacts as well as design solutions with multiple benefits. *“At the moment, we are so diffuse and aren't thinking about how the cultural, social, economic and environmental come together. Fragmentation is there, and we need to figure out how to deal with that.”* Julie Hall

Governments in several countries are pursuing environmental reforms that adopt the language of ecosystem-based management (EBM) in response to environmental challenges, institutional fragmentation, and sectoral interests. EBM can be summarised as an approach that seeks to integrate regulatory functions and community values and aspirations across multiple sectors and scales in order to manage ecosystem health holistically. With its focus on relationships, EBM may enable new ways to secure cross-government collaboration and community buy-in.³⁷

Adding weight to the need for New Zealand to step up efforts to develop an overarching framework, globally 17 world leaders (including from Australia, Canada, Chile, Fiji, Ghana, Indonesia, Jamaica, Japan, Kenya, Mexico, Namibia, Portugal, Norway and Palau) of the Ocean Panel have already committed to sustainably manage 100% of the ocean area under national jurisdiction by 2025, guided by Sustainable Ocean Plans.³⁸ The countries will bring an holistic approach to ocean management that balances protection, production and prosperity to nearly 30 million sq km of national waters. The Ocean Panel also urged leaders of coastal and ocean states across the globe to join in committing to the 100% goal (to sustainably manage 100% of the ocean area under national jurisdiction, guided by Sustainable Ocean Plans, by 2025) so that all Exclusive Economic Zones (EEZ) are sustainably managed by 2030.

Others are suggesting we lift our gaze out further into the future and across multiple generations. “How can we move from a 3 year outlook to 200+ and beyond?” Sally Paterson.

While there are calls to step up efforts, New Zealand has existing commitments, goals and targets which will need to be recognised appropriately in any overarching strategy for New Zealand's ocean estate. These include but are not limited to those relating to:

Sustainable Development Goal 14: Life Below Water

- Target 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
- Target 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.

The Convention on Biological Diversity Goals

The Convention (adopted in 1982) recognised for the first time in international law that the conservation of biological diversity is “a common concern of humankind”. The agreement covers all ecosystems, species, and genetic resources.

Glasgow Climate Pact

The Preamble of the Glasgow Climate Pact (adopted 13 November 2021) highlights “the importance of ensuring the integrity of all ecosystems, including in forests, the ocean and the cryosphere, and the protection of biodiversity ...” and the agreement goes on to encourage work programmes and constituted bodies under the UNFCCC “to consider how to integrate and strengthen ocean-based action in their existing reporting mandates and work plans...”

In addition to the global goals listed above, Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020 expresses New Zealand's commitment to stem the loss of biodiversity worldwide.

Mātauranga and Te Tiriti anchored

It is fundamental that any plan for our ocean is anchored by Te Tiriti. Iwi and hapū have a unique relationship with the Crown through Te Tiriti o Waitangi, The Treaty of Waitangi.

Any Oceans Strategy or plan for Aotearoa New Zealand needs to have a clear reflection of the Treaty of Waitangi within it.

In New Zealand, mātauranga Māori has a significant potential role to play in governance of the

marine estate including for example in establishing legal personalities for ecosystems and species, Mauri-centred reporting frameworks and Marae-centred protocols and Māori decentralised governing models.



Ocean Literacy, Data and Knowledge

“The best pathway to move us towards a sustainable oceans economy has to be through education.” Naomi Aporo

While our understanding of the ocean has been improving dramatically through technologies such as robotic tools and earth-orbiting satellites, the ocean is a vital and complex natural system. We need to improve scientific understanding, build literacy and share and apply knowledge of how ocean ecosystems work, and how they respond to stressors to better inform decision-making.

Contributors to this work believe that better education and knowledge of the ocean and its ecosystems, together with free access to data, will enable industry, central and local government and civil society to make better informed decisions. Education would also support people to understand the significance and influence of the ocean on their wellbeing and the influence of their activities upon the ocean.

Valuing our oceans starts with understanding it. Al Brown

Efforts are already underway with the web platform ‘Land of Voyagers’ created by Taylormade Media as a gift to share with all rangatahi – young people of Aotearoa, New Zealand. This platform celebrates the stories of Polynesian navigators crossing the Pacific Ocean, guided only by their kinship to the natural world. The stories have remained largely untold in our schools since

the arrival of Captain Cook, 250 years ago and by engaging videos and activities on the platform, it demonstrates that science, technology, engineering and maths (STEM) is not something to be afraid of. It’s part of a much bigger world view – mātauranga.

Other examples of inspiring young people include the NZ-VR Project, which to date has delivered more than two million virtually real experiences of the undersea world, 350,000 of those on high-quality headsets within schools.

The science research agenda has also been advanced through the New Zealand’s Sustainable Seas National Science challenge. Building on this work there is an opportunity for New Zealand to join other countries around the world who are investing in knowledge for ocean conservation and management.

Education and building capability should be New Zealand’s number one priority...We need more people inspired to want to solve problems and be involved in the marine space. Dr Craig Stevens

Considering data gaps, a number of contributors highlighted that the data we do have is poorly integrated across different stakeholders. New Zealand doesn’t have an ocean observing system for the collection of baseline environmental data and cannot quantify the state of

marine habitats at the national level or the full impact of fishing on coastal and open ecosystems. Any efforts to advance education and knowledge of our ocean resources would therefore be advanced with open data, particularly for projects supported in part or in full with government funding. Supportive mandates from funding agencies have the potential to strengthen the requirements for data sharing.

We need to build an understanding of the ocean for humanity and bring people together to do it.

Livia Esterhazy

In 2017 the New Zealand Ocean Data Network (NZODN) was launched, modelled on the Australian Open Data Network (AODN), it’s now a collaboration between NIWA and Land Information New Zealand. The AODN portal provides access to all available Australian marine and climate science data and provides the primary access to Integrated Marine Observing System (IMOS) data. A key point of difference is that IMOS is national collaborative research infrastructure, supported by Australian Government – no equivalent exists yet in the New Zealand system, although this could also be an aspiration worthy of further investigation.

Ocean Health: Conservation and Restoration

“What we need to focus on now, is to keep ecological integrity.” Geoffrey Lamarche

New Zealand is a global hotspot for marine mammals and seabirds. New Zealand has 92 indigenous seabird species and subspecies that breed on our shores, and at least 53 marine mammal species and subspecies.³⁹ Around half the world’s albatross and petrel species, and nearly half the world’s whale and dolphin species, use New Zealand’s waters. Thirteen of the world’s 18 penguin species have been recorded in the New Zealand region, and nine of them breed here.⁴⁰ Unfortunately New Zealand is currently losing large amounts of its marine biodiversity. 80% of New Zealand’s biodiversity is at sea,⁴¹ however 22% of marine mammals, 90% of seabirds, and 80% of our shore birds are threatened with, or are at risk of, extinction.

How can we be better ancestors? As a nation we need to embrace existing ocean goals and targets and redefine our relationship with the ocean territory over which we are guardians on behalf of all global citizens and we need to do it quickly. Bronwen Golder

A number of contributors pointed to the clear opportunity for New Zealand to **protect 30% of our oceans by 2030**. A goal to protect 30% of oceans and 30% of land across the globe by 2030 is being advanced by the High Ambition Coalition for Nature and People, an intergovernmental group of 90 countries co-chaired by Costa Rica and France, with the UK as Ocean co-chair. There is an opportunity for New Zealand to join these efforts in support of those seeking international cooperation to reach this global target.

Negotiations for a global ocean treaty are also underway to establish how we protect biodiversity in the high seas (the areas beyond national jurisdiction). As highlighted in the EU biodiversity strategy for 2030, expanding protection to 30% of the EU’s sea area and creating ecological corridors will reverse biodiversity loss, contribute to climate mitigation and resilience and at the same time generate significant financial and social benefits.⁴² How Aotearoa New Zealand engages with growing international momentum and targets for conservation

and preserving biodiversity is an important topic for consideration.

In addition to the environmental goals, protecting biodiversity loss can also make economic sense. Investments in marine protected areas, in particular strictly protected areas, have been shown to generate rich economic return, mitigate climate change (by preventing emissions from the disturbance of sediment carbon by bottom trawling) and multiply the amount of fish and marine life where protection is effective. More specifically, recent research published in 2021⁴³ has provided the first estimation of the economic valuation of the recruitment effects from a well-established temperate no-take Marine Protected Area (MPA) in New Zealand. The recent research represents a step forward for quantifying the economic benefits of marine reserves. Empirical evidence shows that 10.6% of newly settled juvenile snapper sampled up to 55 km outside of the MPA were the offspring of adult snapper from the MPA. This suggests a significant boost to the commercial fishery of \$NZ 1.49 million catch landing value per annum and \$NZ 3.21 million added from recreational fishing activity associated spending per annum. These values all come from the recruitment effects associated with one species, from only 0.08% of the marine space in the Hauraki Gulf, New Zealand.

In New Zealand support for

marine protection has also grown in recent years amongst stakeholders. For example, the idea of protecting 30 percent of the Hauraki Gulf is now embraced by 77% of New Zealanders according to a recent poll. The poll of 1020 respondents was conducted by Horizon Research from 27 September to 17 October 2021.⁴⁴

Beyond MPAs a number of contributors also highlighted the opportunity for more agile, flexible and temporary approaches to protection. The two-year rāhui Ngāti Pāoa has placed around Waiheke’s coast on gathering scallops, mussels, crayfish and pāua to give the species a chance to recover has been referenced as a success. A rāhui has the purpose of conserving, protecting, or sustaining a natural resource is applied with intent to restore the mauri (life essence) of the resource. Rāhui may be placed on forests, gardens, food gathering areas, rivers, lakes or the sea, and may be placed for a variety of reasons such as claiming ownership, respecting the site of a recent death, the need to replenish food stocks or resources in an area, or to prevent the risk or spread of disease.⁴⁵ A unifying theme of recent rāhui is to make sure there is a sustainable amount of resource so future generations can use them at the same or better rate than is currently used. Examples of rāhui include but are not limited to Ngāti Hei rāhui on Opito Bay (for Coromandel scallop fishery) Te Whanau a

Rangiwhakaahu rāhui on Te Wai O Te Taniwha (to support the health of the Mermaid Pools and ngāhere) Te Kawerau ā Maki rāhui on Waitākere (over the Waitakere forest).

Further to MPAs and rāhui, Te Ohu Kaimoana have indicated that tools within New Zealand’s marine management system are many and range from fishing method restrictions and closures, catch limits such as total allowable catch and bag limits, mataitai and taiapure to marine reserves and marine mammal sanctuaries.

As discussed in prior sections, a focus on EBM is another possible mechanism to manage ecosystem health holistically and enable new ways to secure collaboration and community buy-in. Given the unique nature of Aotearoa New Zealand, there may also be room to innovate on the concepts of MPAs and EBM into something that further reflects traditional knowledge and themes.

Recent media reports suggest Covid-19 sparked a boat boom and the bag limits for recreational fishing are often generous. To ensure there is enough fish in the sea for future generations contributor Al Brown suggested we get much more innovative in how we are approaching conservation:

We need to start embracing some radical thinking for conservation. Could we have seasons? Could we halve amounts for certain reasons? Could we tell great stories of catch and release? How could we value all fish we catch so that no fish is a second-class citizen? Al Brown

I don’t believe Pre-European Māori harvested all year, they had seasons. My grandad told me how his grandad and hapū only used to fish for groper in winter, preserving feeding stock and that’s when heads were fattest. Tā Mark Soloman

As well as multiple provisions in overlapping marine legislation, many stakeholders identified parts of the Fisheries Act 1996 that are underused for conservation purposes. These can enable protection of special marine habitats and may promote an ecosystem approach to fisheries management (EAFM). An example given is Section 9(c), which enables the protection of habitats of particular significance for fisheries management, although there has been no formal, consistent and documented use of this provision. These provisions, along with others noted above, also have the potential to be used in the short term to enable immediate action.⁴⁷

Emissions Reduction: Carbon Capture and Storage

Climate is as much about the ocean as the atmosphere. This is because the ocean is our largest climate regulator and can be both a source and sink of carbon. The ocean is both a victim of and potential solution to the climate change crisis.

We are not moving fast enough, given we're in a climate emergency.
Dr Craig Stevens

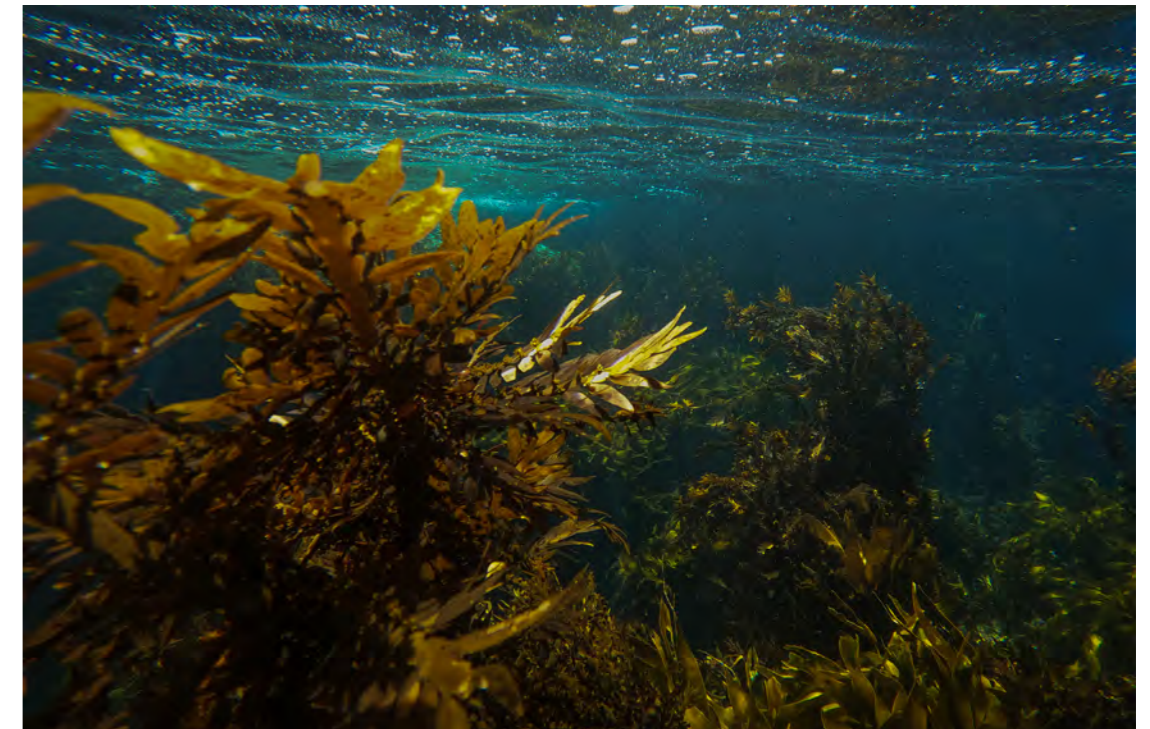
The ocean plays a crucial—often unrecognised—role in mitigating climate change. Ocean waters have absorbed 93 percent of the excess heat caused by greenhouse gas emissions since the beginning of the industrial revolution—no doubt slowing the impacts felt on land, and buying the planet more time. In addition, the ocean and its coastal habitats also offer a range of potential options to sequester carbon, thereby supporting efforts to reduce GHG emissions. It is a little-known fact that coastal ecosystems are estimated to sequester up to 20 times as much carbon per acre than terrestrial forests.⁴⁸ Simply put, ocean ecosystems serve as the largest carbon sink in the world, highlighting the urgent need for approaches to invest in and incentivise restoration.

To preserve a liveable climate, the preamble of the Glasgow Climate Pact (adopted 13 November 2021) highlights “the importance of ensuring the integrity of all ecosystems, including in forests, the

ocean and the cryosphere, and the protection of biodiversity ...” and the agreement goes on to encourage work programmes and constituted bodies under the UNFCCC to consider how to integrate and strengthen ocean-based action.

We don't hear about the climate and the ocean together within the rhetoric, and we need to.
Sally Paterson

A review of climate solution options was undertaken as part of a report commissioned by the High Level Panel for a Sustainable Ocean Economy. The resulting Special Report ‘The Ocean as a Solution to Climate Change’⁴⁹ estimates that ocean-based climate solutions could reduce global GHG emissions by up to 4 billion tonnes of carbon dioxide equivalent annually by 2030 and by up to 11 billion tonnes annually by 2050. This could contribute at least one-fifth (21 percent) of the emission reduction required in 2050 to limit warming to 1.5°C and 25 percent for a 2°C target. For context, emission reductions of this magnitude are equivalent to the annual emissions from all coal-fired power plants worldwide.



Closer to home, the role of forests in mitigating New Zealand's emissions has dominated the policy agenda for the last few years and yet it's estimated that New Zealand's oceans will in fact absorb more carbon dioxide than New Zealand forests. Despite the ocean's clear climate role there's no overall framework supporting and protecting New Zealand's oceans as a sink for carbon dioxide. An oceans strategy could provide the necessary overarching framework to support this agenda.

New Zealand's oceans act like a giant sponge against the effects of climate change. It's likely our seas take up more carbon dioxide than our forests, but there is only so much they and the life in them can take – and the limits aren't yet known. Secretary for the Environment, Vicky Robertson.⁵⁰

The carbon stored in oceans and coastal marine habitats is known as ‘blue carbon’. Human actions can impact blue carbon through climate feedback mechanisms (i.e. climate change impacting the amount of carbon the ocean can hold) and through more direct

actions (such as bottom trawling releasing carbon from the sea floor). New Zealand's Climate Commission has noted that blue carbon could potentially be stored or preserved, for example, by growing or restoring seaweed, mangroves or seagrasses. Likewise it could be released through practices such as bottom-trawling, or disturbance of marine habitats. The Climate Commission stated in its May 2021⁵¹ report that “Understanding the quantity of carbon stored or released is most relevant for our emissions budgets and targets, although it is not yet included in domestic or international reporting or accounting frameworks. Long-term data as to how oceans store carbon is limited and requires further scientific research before it could be included in reporting and accounting frameworks, and in emissions budgets and targets.” A small number of sites in Aotearoa are currently being assessed for their potential to store carbon. Non-governmental organisation, The Nature Conservancy (TNC) has initiated the assessment, as part of various blue carbon credit pilot projects around the world.

Given the potential of significant carbon storage and

release there is an opportunity for further concerted focus on the blue carbon potential of coastal and marine ecosystems. Globally there is also interest in advancing knowledge of carbon capture and storage in the sub-seabed through international collaboration, appropriate incentives and mapping the storage potential of sub-seabed geological formations. As an additional benefit, preserving blue carbon sequestration through restoration of mangroves or seagrasses has the potential to also preserve coastal biodiversity. This means the restoration of sea-bed habitats and developing solutions to depollute areas or limit eutrophication are also supportive of biodiversity and thus the resilience of coastal and marine ecosystems.

Evaluating Ocean-Based Renewables

“With significant growth overseas, it makes sense to consider offshore wind renewables, the question is, is it overall a good thing for Aotearoa?”

Dr Craig Stevens

It has been estimated that offshore wind turbines could generate significantly more power than the present total global electricity consumption. In 2018, offshore wind provided a tiny fraction of global electricity supply, but the World Energy Outlook has predicted it is set to expand strongly in the coming decades into a USD 1 trillion business.⁵² Other potential sources of ocean-based renewable energy—producing energy from waves and tides, salinity and temperature gradients (e.g. by ocean thermal energy conversion or by heat pumps for heating and cooling), and floating solar photovoltaic panels, for example.

For New Zealand, investment in technology development and demonstration projects has the potential to help advance ocean-based renewable energy including wind, wave, tidal, current, thermal and solar. Further work with iwi, industry and other stakeholders will be essential to develop clear development frameworks which

address environmental impacts and enable co-existence and integration with other uses of the ocean.

Notably, efforts to support carbon free shipping have also been advancing rapidly. Shipping, currently the most energy-efficient form of transport, is vital to international trade and connectivity as it continues to move over 90% of global goods.

International Maritime Organization’s Energy Efficiency Design Index requires ships built after 2022 to be at least 50 percent more efficient over 2008 levels, and total shipping GHG emissions to be reduced by at least 50 percent in 2050. The industry is now actively working and collaborating on this agenda. The ‘Getting to Zero Coalition’ convenes more than 100 companies and shipping-related stakeholders (e.g. ports) to develop commercially viable zero emission vessels, powered by zero emission fuels by 2030.





The Premium Opportunity of Sustainable Business

Both in New Zealand and around the world there is growing demand for low environmental footprint, short supply chain products.

This is reflected in the rise of various certification systems, digital traceability along with growing interest in buying local and direct from the fisherman or farmer. Contributor Tom Hishon supports these buy local preferences and the sustainable business opportunity for his Britomart based restaurant *kingi*.

Sustainability has different meanings to different people. How I've defined it with *kingi* is through the selection of fish we put on the table, the catch method and the suppliers we work with. We need to get back to how we used to fish and have a sense of community. We need to sell people on that. Tom Hishon

When assessing sustainability driven commercial opportunities, New Zealand has a strong history of public narrative in the benefits of shifting from volume to value on land. This kind of thinking has resulted in various industry transformation plans, which include science and technology solutions as well as demonstrating provenance values.

As with primary industries on land, we need to look at value of products and services and know that consumers are willing to pay for a shift from extractive to regenerative. Jane Taylor

Indeed, a recent meta-analysis of 80 worldwide studies across the broad area of sustainable food products, including different sustainable attributes, demonstrated that the overall WTP (willing to pay) premium for sustainability (in percentage terms) is 29.5% on average. Innovative technologies such as the use of artificial intelligence, satellites, and real time data collection have the potential to support New Zealand's shift from volume to value, towards sustainable business in the immediate future. Business model innovations including indigenous and local community knowledge will also be important.

How can our natural capital be protected for competitive advantage? Jeremy Helson

We need to be asking where are the best opportunities for business? beyond seaweed and offshore wind. Geoff Ross

Potential opportunities to protect our natural capital for competitive advantage can be seen in new product areas (seaweed, land-based fin-fish and hatcheries), processing sustainably farmed foods into high value nutritional products, and circular economy uses of the whole product (shells, unprocessed meats, unwanted seaweed).⁵⁴ Broadly speaking in New Zealand there are unique

opportunities for sector-based transformation and the development of premium brands through public/private solutions and collaborative approaches.

Further understanding of New Zealand's position against changing consumer interests will be critical to secure future focused opportunities and support the long-term sustainability of New Zealand origin seafood products. Immediate opportunities might include, for example, potential bio-based products, biofuels, and even algae-based foods. Contributors pointed to the fact that this issue is as much a "stay in business" issue as much as it is a value add; New Zealand needs to meet growing consumer demand for sustainably produced products.

The New Zealand Government is also supportive of a shift towards sustainable business opportunities. For example, growing New Zealand's aquaculture industry in sustainable ways has been an area of focus of recent government bodies. The New Zealand Government's food and fibre sector roadmap 'Fit for a Better World' also reflects growth towards sustainable business, with five elements identified to support the sector to prepare for a better world; a regenerative mindset, a taiao approach, commitment to ethical production, consumer focus and provenance.⁵⁵

Story Telling: Demonstration Projects

“If we can make the Gulf work, we can make it work anywhere.” Alex Rogers.

“We need to embrace what a successful future looks like in the ocean space. The Kermadecs could do that. The Hauraki Gulf could do that.” Bronwen Golder

“We need to showcase the work of fishermen and women who are doing it well, and give more support for those taking a kaitiakitanga approach.”

Tom Hishon

A consistent theme across many of the contributors to this work was the suggestion to tell the stories and showcase what is already working well. The Hauraki Gulf for example is seen as a valuable location to share learning of what works given a number of factors, including but not limited to:

- A marine spatial plan that incorporated broad stakeholder participation already exists.
- Investment from a variety of different sectors continues to occur
- The marine environment is under a range of different pressures
- There are very high natural values (species, places, ecosystems) in the Gulf
- A significant proportion of the national population lives around the edges of the Gulf, and there is a high level of public interest and high pressure from terrestrial land use and public use of the coastal environment.

Foundation North’s Gulf Innovation Fund Together, or GIFT, has been supporting the restoration of the mauri or life force of Tikapa Moana/ Te Moananui-ā-Toi (Hauraki Gulf). When Foundation North initiated this fund in late 2016, it knew little about the human systems surrounding the Hauraki Gulf, root causes behind its environmental degradation, or what

it would take to reverse declining ecosystem health. Case study reflections by the Foundation North team have however, shone a light on what is blocking change and therefore where seeds of hope and potential lie.

The work of the Kaikōura Guardians has also been raised as an inspirational story to be told. The Kaikōura Marine Guardians have a direct responsibility to advise Ministers over issues affecting the purposes of the Kaikōura Marine Management Act 2014, and in the Kaikōura Marine Area. The Kaikōura Marine Guardians represent Te Rūnanga o Ngāi Tahu, the Kaikōura community, biosecurity, conservation, education, environment, fishing, marine science and tourism interests and are each appointed for a term of up to five years. The Act established a number of marine protection and sustainable fisheries measures in the Kaikōura marine environment. There are many more examples being developed now from the ‘Coastal People: Southern Skies’ project at Otago University to the Kaipara Moana Remediation programme and beyond. We hope the momentum generated by this Roadmap and future Ocean Initiative will continue to elevate and connect these efforts, as well as direct funding to field-leading projects like these on ground and at sea.

Innovative Financing: Priming the pump

Innovative Financing refers to non-traditional approaches or non-conventional financial instruments that tap into a variety of funding sources including public, private and philanthropic to enhance capital flow and impact-related outcomes.

“How can we bring everyone together to tell all the stories, the good and the bad? How can we then take all of that and create enduring solutions.” Geoff Ross

Increasingly innovative financing models have the potential to support marine restoration and leverage synergies with land-based opportunities to generate positive outcomes for people, planet and profit. This is seen as increasingly important as financing gaps for fulfilling the pledges of the Paris Agreement and UN Sustainable Development Goals (UNSDGs) run into trillions of dollars.

“Within this decade, we need to move from millions to trillions when it comes to financing nature and achieving global climate and biodiversity objectives,” Elmedina Krilasevic, senior programme coordinator for NBS (nature-based solutions) Finance at IUCN.

Fortunately, the institutional will to address this shortfall is also growing. In Aotearoa New Zealand, for example, investment barriers have been investigated through such initiatives as Aotearoa Circle’s Sustainable Finance Forum. Both in New Zealand and globally we are also seeing a shifting landscape as philanthropic foundations seeking

positive impact are increasingly seeing the private sector as a vital route to scale social and environmental benefits. By deploying high risk capital to test and prove business models, or provide patient capital to support expansion, the foundations can “prime the pump” to attract mainstream and impact finance to the sector or issue. With the injection of public or philanthropic funding sources, private investment capital can be de-risked, catalysing private investment.

Governments can also help stimulate the pipeline of sustainable ventures and projects by providing grants or other forms of support to early-stage innovation, as Norway has done to support next-generation offshore aquaculture and the European Union has done to support offshore wind generation. In the offshore energy sector, governments could support renewable energy by providing low-cost infrastructure, setting feed-in tariffs and providing subsidies for certain sustainable activities, for example.

It’s important to note that while there is potential for increased impact with the injection of catalytic capital, being effective in such a landscape demands concerted co-operation and collaborative mobilisation of resources to achieve the necessary impact at scale. In addition to co-operation and collaboration there are a number of

instruments which may be relevant to the landscape in New Zealand. Blue bonds is just one example, and are a relatively new type of sustainability bond which mobilises finance for projects related to ocean conservation⁵⁶. The Hauraki Gulf Blue Bond⁵⁷ is a debt instrument for which the use-of-proceeds are linked to the protection, rehabilitation and enhancement of the mauri (or life force) of the Hauraki Gulf/ Tikapa Moana/Te Moana-nui-ā-Toi. Investors are paid an interest rate on a fixed schedule and will receive their initial investment (principal) upon maturity. The Bond could be issued to institutional investors by a bank, local or regional council, or even as a sovereign blue bond by the New Zealand Government.⁵⁸

Mitigating Maritime Security Risk

New Zealand's dependency on the oceans brings with it very real security and biosecurity implications.

Many hundreds of non-native species have been introduced to New Zealand waters, but not all of them are harmful. Most have arrived with shipping, either attached to the submerged surfaces of ships (biofouling) or in the ballast water carried by large vessels to maintain stability.

Our remoteness from global markets increases the importance of a robust maritime security system to support our access to global supply and value chains. Increasingly important is the movement of information that relies on undersea lines of communications to connect us to a digitised world. The protection of these routes has been the focus of our security efforts in the past but new challenges now confront us. The competition for fishing resources in the near Pacific, the Southern Ocean and even within our EEZ is being made even more complex with international interest in undersea resources. This is a challenge that is shared with our Pacific Island neighbours, and an area where we could lead and partner on behalf of the blue continent.

New Zealand does not have large naval forces and policing our waters is a difficult task given the sheer vastness of our EEZ. While technological advancements with satellite surveillance helps to mitigate the issue, a physical presence is sometimes deemed necessary as a deterrent. For example, the Navy conducts patrols in the South Pacific and territorial seas of NZ.⁵⁹ These patrols are valuable as a deterrent to illegal fishing activity, and for providing evidence for prosecution if illegal activity is detected.⁶⁰ Patrols are also important to ensure enforcement of

NZ-registered vessel's adherence to MPAs, BPAs, no-trawl zones, using legal fishing techniques, etc. Illegal, unreported and unregulated fisheries capture have been modelled to increase with geopolitical and climate change pressures.⁶¹ Taken together these changing pressures on our marine space will mean protecting NZ's food security will become increasingly important into the future.

New Zealand uses its relationships, security deployments and overseas development assistance to work with others to tackle the root causes of maritime security threats. These efforts can range from supporting refugee assistance and processing systems to reducing the attractiveness of irregular immigration, through to the promotion of alternative forms of economic activity to divert people from harmful activities (such as illegal fishing and drug trafficking). The EU's maritime security strategy and related action plan set out a cooperative response to maritime security challenges of our time. New Zealand's own Maritime Security Strategy published in 2020 also focuses on managing key risks and threats within our territorial sea. Enhancing information (including in-situ, aerial and satellite data) is seen to be a crucial factor in addressing security challenges, preventing illegal activities at sea and enforcing the law.

Given the current and future importance of maritime security to Aotearoa New Zealand, the development of any overarching plan or strategy for New Zealand's oceans needs to integrate maritime security as a key pillar.



An Invitation
and

Concluding

Thoughts

Part 05

At the outset of this project, we sought to look back in order to move forward and review existing research, then listen and capture the views of a diverse, thoughtful group of New Zealanders. Through wide ranging kōrero we have explored a range of values and ideals, assumptions and expectations while also seeking to understand various interactions between the biophysical environment and economy. At the close of this first phase we propose a pragmatic action agenda and set of next steps to help navigate the path ahead.

Distilling the collection of insights gathered through the course of this mahi, at the highest level we see the opportunity to:

1. Create a mindset shift and new narrative for the future, all in support of an ambitious shared vision.
2. Swiftly progress development of a strategy and coherent overarching approach to our marine space.

It is only by embracing systematic and strategic thinking that New Zealand will be able to capture the full opportunities in focus areas including but not limited to:

- ___ Ocean Literacy, Data and Knowledge
- ___ Ocean Health: Conservation and Restoration
- ___ Carbon Capture and Storage
- ___ Ocean-based Renewables
- ___ Sustainable Business
- ___ Story Telling: Demonstration Projects
- ___ Innovative Financing
- ___ Mitigating Maritime Security Risk

3. Support enduring system stewardship by resourcing an independent entity to facilitate, convene and catalyse future collaborative work in this space.

We believe the Ocean Roadmap for New Zealand identifies the building blocks of change and a platform to support wider discussions on how we best move forward together.

While our focus here is rightly on Aotearoa New Zealand, many of the challenges and opportunities discussed are shared by our neighbours and friends throughout the Pacific. As we advance our collective work, we hope there will be opportunities to share and collaborate on ways to build the health and wealth of the ocean across the blue continent.

Throughout this document we have underscored that although the challenges are complex, building a sustainable and prosperous ocean will require foresight, sound science including Mātauranga, strategic use and conservation of precious natural capital and a deep commitment to making tangible progress. Given the urgency of current challenges and future potential opportunities, doing nothing is simply not an option. This is the moment to come together. It is our hope that this Roadmap will accelerate cross-sector conversations and catalyse the political will necessary to lead on this issue.

We invite you to join this ‘Call to Action’ to secure New Zealand’s ocean health and wealth for generations to come.

As we have stressed throughout this report, it will take collective action to make this vision a reality. If you would like to be a part of this effort moving forward, or have feedback on this Ocean Roadmap, please direct thoughts and comments via support@theleverroom.com

The Lever Room is a strategic consultancy with global expertise that helps clients deliver and measure positive sustainability and climate impact. Based in Aotearoa New Zealand since 2007, we're accelerating the transition to a net zero, nature positive future through our unique evidence-informed approach.

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