



# Seafood Sector Adaptation Strategy

Climate Adaptation Strategy 2021 – 2030



**The  
Aotearoa  
Circle**

Mā te Kaitiakitanga  
ko te Tōnūtanga  
Prosperity Through  
Guardianship

# Strategy development by numbers

44+

Stakeholders contributed to the strategy development

23+

Seafood sector organisations represented in the strategy development process

11

C-suite executives from seafood sector organisations in the strategy development Leadership Group

2

Online surveys to elicit expert insights prior to strategy development workshops

10

Working group sessions with the Leadership Group and Advisory Group

1

Seafood Sector Adaptation Strategy

# A climate adaptation strategy for the seafood sector



## Breaking new ground in adaptation in Aotearoa

Climate change presents a range of existential challenges for our seafood sector. Physical climate impacts such as changing temperatures, ocean acidification, and species migration will change what, where, and how marine organisms can be caught and farmed. Transitional factors such as changing consumer preferences, new regulatory settings, and rising fuel costs will likely require innovation on an unprecedented scale for today's seafood organisations to remain prosperous under tomorrow's socio-economic conditions.

For the first time, sectoral leaders and subject matter experts from government, iwi, industry, banking, research, and environmental NGOs have come together to address these challenges. They have collaborated in the development of this Climate Change Adaptation Strategy for the Seafood Sector, with the aim of enhancing the resilience and adaptive capacity of Aotearoa's seafood system so that future generations can enjoy a thriving marine environment, blue economy, and seafood community.

## About this strategy

This Seafood Sector Adaptation Strategy is an output of The Aotearoa Circle's Marine Domain 'Phase 2' workstream. It represents the collective, and voluntary, effort of participants in the workstream from February to November 2021.

This Adaptation Strategy builds upon earlier work by the Marine Domain 'Phase 1' workstream, which explored plausible scenarios of climate-related risk and opportunity in the seafood sector (August 2020).

Implementing this Adaptation Strategy will be an essential step towards safeguarding the cultural, ecological, social, and economic fabric of Aotearoa's seafood sector in the face of rapid, uncertain change.

The risks posed by climate change are considerable. However, the opportunity to purposefully adapt in ways that bring lasting co-benefits to habitats, ecosystems, communities and businesses could allow Aotearoa's seafood sector to secure its position as a leading provider of sustainable protein in domestic and international markets.

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## Waiho i te toipoto, Kaua i te toiroa

“Let us stay close together, not far apart”

E ngā rangatira o te motu, ka nui te mihi aroha ki a koutou.  
Nō reira, tēnā koutou katoa.

The seafood sector is already witnessing the effects of climate change. Looking ahead, climate-related risks and opportunities are likely to have far-reaching consequences for our marine environment, the wellbeing of our people, and the long-term sustainability of our businesses.

This Seafood Sector Adaptation Strategy demonstrates our shared commitment to adapting to climate change and working towards a more resilient future. In this context, it is important to recognise the historical and cultural significance of the marine environment for Māori and the diverse whakapapa connections within. Mātauranga Māori and te ao Māori provide the original lens towards better understanding the capacity and resilience of marine ecosystems and designing sustainable, purpose-led businesses and governance structures.

We also acknowledge Dr Juliet Gerrard’s recent report, The future of commercial fishing in Aotearoa New Zealand, and tautoko Dr Gerrard’s conclusion that, above all else, bold leadership is the key to addressing complex challenges in the seafood sector.

This Strategy has been driven by the voluntary efforts of representatives from industry, iwi organisations, government, civil society and the science community, and reflects a shared understanding that we must work together in order to rise to the climate change challenge – waiho i te toipoto, kaua i te toiroa. We believe that bold leadership means working in genuine partnership and acting urgently without losing long-term perspective. It also means drawing upon the best available information and actively supporting the development of mātauranga Māori and other forms of knowledge in this space.

In the course of developing this Adaptation Strategy, it was striking to observe the palpable sense of purpose felt across the sector, and the collective recognition of how much is at stake. Our Strategy sets out our shared vision statement and strategic goals to respond to climate change, each accompanied by specific objectives and commitments that will focus our adaptation efforts and drive action.

We would like to sincerely thank everyone who has contributed to our Strategy. We must now shift our focus to implementing our commitments, ensuring that partners and stakeholders are brought on the journey, and collaboratively working towards a resilient and thriving seafood sector.

The most meaningful mahi is still to come. Nō reira, mahia te mahi.

Tēnā tātou katoa.  
Co-Chairs and Leadership Group



**Maru Samuels**  
CE, Iwi Collective  
Partnership(Co-Chair)



**Lisa te Heuheu**  
CE, Te Ohu Kai  
Moana



**Doug Paulin**  
CEO,  
Sealord



**Todd Charteris**  
CEO,  
RaboBankNZ



**Dan Bolger**  
D-DG, Fisheries NZ  
(Co-Chair)



**John Morgan**  
CEO,  
NIWA



**Volker Kuntzsch**  
CEO,  
Cawthron



**Livia Esterhazy**  
CEO,  
WWF



**Andre Gargiulo**  
CCO,  
Sanford



**Gary Hooper**  
CEO,  
AquacultureNZ

Secretariat services provided by:



# Te Ao Māori and climate adaptation in the seafood sector



As a Leadership Group, we acknowledge te ao Māori as an enduring worldview that is weaved into the land and seascape; a worldview founded in the whakapapa between humanity, the ocean, and the atua, Tangaroa and Hinemoana.

We are committed to ensuring that this whakaaro is embedded across our programme of work.

An initial attempt has been made to incorporate this whakaaro into our Seafood Sector Adaptation Strategy. However, the Leadership Group acknowledges the evolving nature of this narrative for Māori and, therefore, ourselves and other stakeholders. With the support of iwi Māori members we will strengthen our relationships with Māori and grow our understanding of te ao Māori for articulation and practical application.

These commitments are made not only to acknowledge tāngata whenua and Te Tiriti o Waitangi, but also to recognise that whakapapa and wairuatanga - perspectives that are indigenous to the land and sea - add context, depth, and value to the Strategy's vision and objectives.

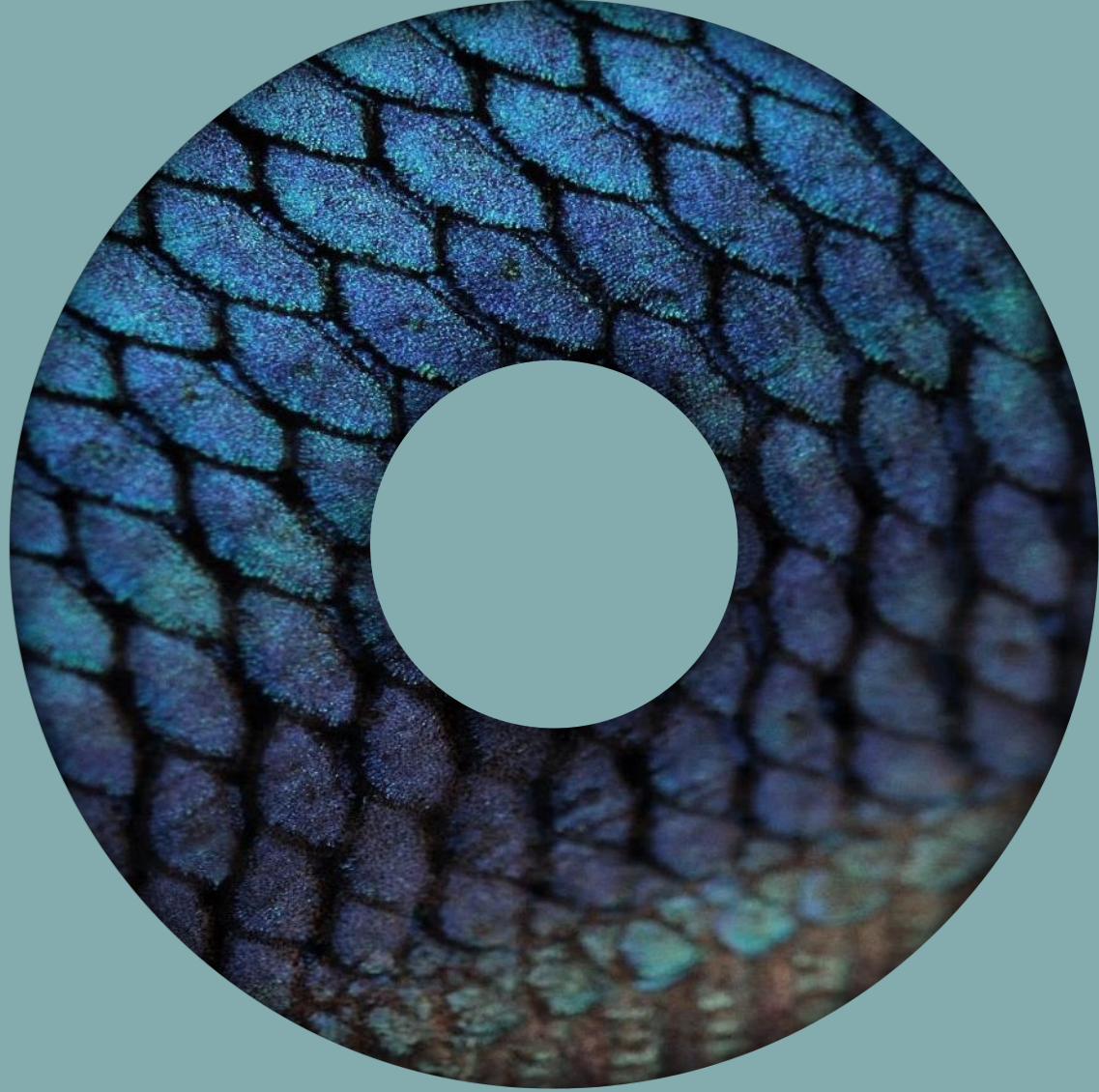
Working according to te ao Māori is a new journey for many of us on the Leadership Group, but we absolutely want to get it right.

Therefore, we will follow the lead of our iwi Māori members; and we will make connections with the various workstreams and organisations throughout the motu that are focused on developing the Māori worldview.



# Executive summary

01



# Why we need a Seafood Sector Adaptation Strategy



This Seafood Sector Adaptation Strategy (2021-2030) is focused on building resilience and taking action in response to climate-related risks and opportunities.

## The case for change

Responding to climate change is a critical part of maintaining a thriving marine environment and enabling the seafood sector to achieve sustainable, purpose-led growth.

The urgent need to understand and address climate-related risk is beyond debate, as recently recognised in the Primary Sector Council's *Fit for a Better World* (2020), the New Zealand Government's *Aquaculture Strategy* (2020), and the Prime Minister's Chief Science Advisor's report *The Future of Commercial Fishing in Aotearoa New Zealand* (2021). The conversation has shifted from 'Should we respond to climate change?' to 'How do we respond to climate change?'.

This Strategy focuses on the commercial sector, but recreational and customary fishers will also have key roles to play in enhancing the resilience of Aotearoa's marine environment. The aim of this group is to build relationships that will enable greater collaboration on adaptation as our climate knowledge matures.

## We must act with urgency

Climate-related risks are complex, dynamic, and unfolding today. In 2020, the Marine Domain 'Phase 1' workstream developed scenarios of physical and socio-economic change to explore these climate-related risks in more detail. From this work we found that:

- The seafood sector faces challenging climate-related risks, whether the world continues on a high-emissions trajectory or abruptly decarbonises to meet the goals of the Paris Agreement
- Climate-related risks warrant urgent and decisive action, grounded in the best available knowledge
- Multi-stakeholder collaboration is the key to building resilience

## Evidence must guide our actions

To remain fit for purpose, our Strategy must adapt and change in the face of new information. What we learn must inform what we do, and our Strategy will guide but not dictate this adaptive process.

## Sector-level collaboration is the key

Climate-related environmental, economic and social disruption in the seafood sector will require adaptive responses that no individual organisation – whether a commercial operator, government department or science provider – can undertake in isolation.

- Iwi and commercial operators need the support of regulators and science providers to navigate uncertainty and changing conditions in a manner that preserves environmental integrity, economic viability and social equity.
- Policymakers need timely information and collaborative engagement across the sector in order to catalyse change and build long-lasting resilience.
- Science and data providers need clear signalling about how information and knowledge can best be put to use to inform adaptation in practice.

This Strategy is focused on establishing foundational and collaborative mechanisms at a sectoral-level to enable proactive and effective adaptation action.

Objectives and commitments focussed on commercial sector operators will in most cases be lead by commercial sector actors. Similarly, government and research sector actors will typically lead their respective activities.



# Our strategy on a page



## OUR VISION

*“A thriving marine environment, blue economy, and seafood community”*

## OUR MISSION

*“As kaitiaki we work together to adapt to climate change and ensure a resilient future”*

## OUR STRATEGIC GOALS & SPECIFIC OBJECTIVES

### Culture and wellbeing



#### **Bold leadership**

“We share a clear, common purpose and take collective responsibility for change”

- 1.1 We will proactively and visibly lead our stakeholders toward the achievement of our vision, taking accountability for driving adaptation action and publicly celebrating our successes
- 1.2 We will identify the adaptation options available to us and reach agreement on when and how they will be implemented
- 1.3 We will ensure that our stakeholders understand the risks and opportunities posed by climate change well enough to be able to prioritise and implement adaptation actions



#### **Resilient prosperity**

“Our businesses are effectively adapting to disruptive market changes and stewarding marine ecosystems”

- 2.1 Our climate change adaptation actions enhance the resilience of a climate-stressed marine environment
- 2.2 Our sector is diversifying its methods, products and markets to better cope with climate-related disruption
- 2.3 Our climate change adaptation actions enhance the resilience of a climate-stressed marine environment
- 2.4 Our climate change adaptation performance is transparently communicated and converted into long-term increased value

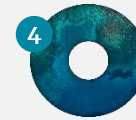
### Systems and settings



#### **Practical knowledge**

“Our knowledge system supports mātauranga Māori and provides the evidence required for innovation and good decision-making about climate-related risks and opportunities”

- 3.1 Vulnerability to climate change within the sector is assessed by identifying climate-related hazards, assessing exposure to them and gauging sensitivity to their impacts
- 3.2 The growth of a collaboratively resourced and holistic seafood adaptation data and information system in Aotearoa is supported
- 3.3 How data and information are used to make adaptation decisions is transparently communicated
- 3.4 Insights into the evolution of risk and opportunity in the seafood sector are captured, and lessons learnt from adaptation are gathered to inform decision making



#### **Values-based governance**

“Our legislative, regulatory, and resource management systems reflect our principles, and respond quickly and boldly to the challenges that climate change poses to New Zealand’s marine environment and seafood community”

- 4.1 Climate-related risk is mainstreamed within regulatory and management-level decision-making
- 4.2 The capacity of the legislative, regulatory and management systems to respond to climate change risk and opportunity, and take action to support and enable their improvement, will be regularly assessed



# Climate-related risks & opportunities



## Marine ecosystems are already being impacted by climate change

The IPCC's Sixth Assessment Report (AR6) concludes that human activities have already altered our climate system and will continue to do so. Over the past century, the planet's average surface temperature has risen by about 1.1°C.

More than 90% of the excess heat trapped by the climate system has been absorbed by our oceans and is contributing to marine heatwaves, sea level rise, and ocean stratification. CO2 emissions from human activities is also causing ocean acidification. These impacts are having a profound effect on marine ecosystems.

The Paris Agreement, signed in 2016, includes an ambitious goal of pursuing efforts to limit global warming to 1.5°C. The risks of exceeding 1.5°C include significant disruption to marine, land, and human systems and the possibility of triggering global 'tipping points' that cause abrupt and potentially irreversible change. Coral reefs, for example, are anticipated to decline by 70%-90% in a 1.5°C world, and 99% in a 2°C world.

## The seafood sector faces challenging climate-related risks and opportunities

Effectively addressing climate change involves identifying, analysing and responding to a range of climate-related risks and opportunities, as follows:

- **Physical risks** include long-term 'chronic' changes (e.g. sea level rise and stratification) and 'acute' climate-related events (e.g. storms and marine heatwaves). Physical risks threaten biomass and marine ecosystem health, as well as fisheries operations, supply chains, and employee safety.
- **Transition risks and opportunities** reflect the challenge of shifting to a climate-resilient, low carbon economy. Examples of transition risk and opportunity include shifts in supply and demand (e.g. reduced demand for emission-intensive protein), technology (e.g. electric fishing vessels), regulations (e.g. increasing carbon price), social views and expectations (e.g. diminished social license to operate), as well as the legal and capital implications of failing to respond to the issues above (e.g. civil lawsuits and reduced access to capital).

As daunting as these risks may seem, rising to the climate challenge can create profound opportunities for the seafood sector. For example, the development of innovative new products, markets and ways of working, cost savings bought on by efficiency gains, and the opportunity to create value from the sector's sustainability credentials will all accompany a shift to a climate-resilient, low carbon blue economy.

## The origins of our Seafood Sector Adaptation Strategy

This Strategy builds upon earlier work by the Marine Domain 'Phase 1' workstream which explored plausible scenarios of climate-related risk and opportunity in the seafood sector.

Two scenarios were developed. The first, '**Māko**', describes a world that has failed to curb emissions and must address the physical and socio-economic consequences of significant climate disruption. The second scenario, '**Kahawai**', describes a world that has rapidly decarbonised and experienced a paradigm shift towards sustainable economic activity, which has proven highly challenging for many sectors.

Through this scenario analysis work, it became apparent that:

- Aotearoa New Zealand's seafood sector faces challenging climate-related risks, whether the world continues on a high-emissions trajectory or abruptly decarbonises; and
- A collaborative, sector-wide adaptation strategy will be a critical tool to help address climate-related risks facing the sector.

# Key scenario conclusions

The following insights are summarised from the Aotearoa Circle's Marine Domain 'Phase 1' report: *'Climate-related risk scenarios for the 2050s: Exploring plausible futures for aquaculture and fisheries in New Zealand'*.



Climate-related risks are **interdependent** and involve more than biophysical change.



'**Marine protein**' could be the future.



Climate-related risks and opportunities **cannot be understood or addressed in isolation**.



**Multi-stakeholder collaboration** is imperative.



Consumer attitudes to seafood, seafood suppliers, and supply chains **could shift rapidly**.



New Zealand's **geographic location** buys time.



Food security concerns could **broaden consumer horizons**.



The next decade **will be crucial**.

Only a collaborative, sector-wide adaptation strategy can address the impacts of climate-related risk in the seafood sector



# Frequently asked questions



## **Q Why is climate change adaptation important to us?**

We know that our sector is dependent upon a healthy marine environment, and we take our obligation to preserve and enhance Aotearoa New Zealand's natural capital seriously. We are committed to the adaptation principles and actions set out in this Strategy in order to preserve this rich inheritance for future generations.

## **Q What can we do about climate change?**

We all have a responsibility to respond to climate change and we firmly believe we must be part of the solution rather than part of the problem. As a sector, we are committed to working collaboratively to help safeguard Aotearoa New Zealand's cultural integrity, natural capital and economic resilience.

## **Q What timeframe will this Strategy operate over?**

Given the complex and systemic nature of climate change, this Adaptation Strategy focuses on long-term outcomes while also recognising the need to act with urgency. The Strategy covers the period 2021-2030, but includes strategic goals that may take years or even decades longer to be fully realised.

## **Q Who is this Strategy for?**

This Strategy is focused on the commercial seafood sector, which includes a diverse range of businesses, iwi/Māori-owned organisations, government agencies, research institutions, and NGOs. This Strategy is focused on establishing foundational and collaborative mechanisms at a sectoral-level to enable proactive and effective adaptation action by all entities in the sector. We recognise that recreational and customary fishers, and our supply chain partners, may have their own standards and strategies in place, and we intend to work collaboratively to ensure that what we do reinforces their climate adaptation efforts.

## **Q What are we already doing?**

As primary sector leaders, we recognise our responsibility to demonstrate authentic leadership and are leaning into the implications of that for our climate change commitments. We are currently working to better understand our climate-related risks and identify the most effective options to reduce emissions and build resilience across the sector, the communities in which we operate, and the marine environment.

## **Q How will we contribute to the UN Sustainable Development Goals?**

We are committed to advancing the United Nation's Sustainable Development Goals (SDGs). We understand the role the SDGs play in planning sustainability actions at the global scale, and have taken the aims of the SDGs into account in selecting our adaptation goals and objectives. In particular, we believe our adaptation actions will support Aotearoa New Zealand's efforts towards Responsible Consumption and Production (12), Climate Action (13), and Life Below Water (14).



# Our guiding principles



The Seafood Sector Climate Adaptation Strategy is underpinned by the following principles, which will be used to guide decision making, strategy implementation, and related activities across seafood sector stakeholders, communities and organisations. These principles were developed and refined by all stakeholders involved in the strategy development process.



## **We will honour Te Tiriti o Waitangi by working in partnership and applying mātauranga Māori**

We will live our whakatauki by being inclusive, collaborative and equitable. We will take a co-creative, partnership approach and draw on cultural values to achieve our goals.



## **We will take an evidence-based approach**

We will transparently draw our decisions and actions from an evidence-base combining the best available science, mātauranga Māori, and other cultural wisdoms, knowledge and practices.



## **We will take a whole-of-system approach**

Our actions and decisions will be informed by a holistic, whole-system lens which integrates the marine environment, blue economy, and wider society, reflecting an ecosystem-based approach to fisheries management.



## **We will take a long-term and intergenerational focus**

We will responsibly steward the resources of the future through our actions in the present, considering a range of scenarios of plausible change to identify the long-term risks and opportunities they present, and recognising the need to take action in the face of uncertainty and learn through doing.



## **We will demonstrate agility and urgency, and focus on what matters**

We will proactively and flexibly adapt to climate change, being ambitious yet practical, and prioritising actions that offer the greatest impact towards the achievement of our strategic adaptation goals while adopting an enquiring and open mindset to navigating them.

# Our vision, mission and strategic goals



The Vision provides direction and purpose for the Strategy, while the Strategic Goals focus effort into areas which will enable the achievement of the Vision.

## OUR VISION

*“A thriving marine environment, blue economy, and seafood community”*

## OUR MISSION

*“As kaitiaki we work together to adapt to climate change and ensure a resilient future”*

## OUR STRATEGIC GOALS & SPECIFIC OBJECTIVES

### Culture and wellbeing



#### **Bold leadership**

“We share a clear, common purpose and take collective responsibility for change”



#### **Resilient prosperity**

“Our businesses are effectively adapting to disruptive market changes and stewarding marine ecosystems”

### Systems and settings



#### **Practical knowledge**

“Our knowledge system supports mātauranga Māori and provides the evidence required for innovation and good decision-making about climate-related risks and opportunities”



#### **Values-based governance**

“Our legislative, regulatory, and resource management systems reflect our principles, and respond quickly and boldly to the challenges that climate change poses to New Zealand’s marine environment and seafood community”



# Bold Leadership

*“We share a clear, common purpose and take collective responsibility for change”*

## Why is it important?

To ensure change is effective our leaders must be bold, visible, proactive, and accountable, inspiring and collaboratively leading the way toward a climate resilient sector.

## Why do we want to achieve it?

Bold leadership will set the foundations to support the achievement of our Vision by driving the implementation of adaptation actions, celebrating successes, and ensuring that we move together towards a climate resilient sector.

## How will we know we have been successful?

The Specific Objectives define where we will focus our efforts in order to ensure we achieve this Strategic Goal. Our Key Commitments describe what will be implemented to achieve each Specific Objective.

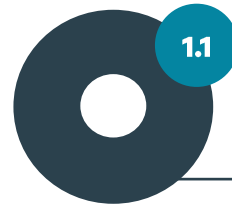
## Waves 1, 2 and 3

Our Specific Objectives and Key Commitments are categorised as Wave 1, 2 or 3. The Waves describe our intended sequence of activity, with Wave 1 activities being undertaken first because they lay the foundations for future commitments. See page 26 for more detail.

STRATEGIC GOAL 1



## Specific Objectives:

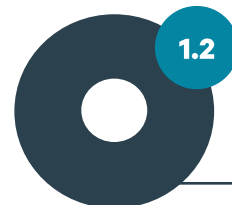


1.1

**We will proactively and visibly lead our stakeholders toward the achievement of our vision, taking accountability for driving adaptation action and publicly celebrating our successes (Wave 1, 2 and 3)**

### Key commitments:

- ✓ An Implementation Group (IG) drawn from representatives of iwi, the commercial sector, policy makers, science and research providers, environmental NGOs and the financial sector will be formed under an agreed Terms of Reference, with IG decisions requiring a 75% majority to be actioned. The IG will be responsible for governing the implementation of this Strategy and report to the Leadership Group. (Wave 1)
- ✓ The IG will assume responsibility for the appointment of appropriately resourced working groups to carry out the analytical tasks required under the commitments to follow. (Wave 1, 2 and 3)
- ✓ The IG will assume responsibility for ensuring the climate adaptation objectives, commitments and actions agreed and documented under this Strategy will be disseminated to key stakeholders, leveraging existing communication channels and creating new ones where necessary to publicise progress. (Wave 1)
- ✓ The IG will foster strategic partnerships to leverage expert knowledge and facilitate the delivery of the Strategy, connecting the implementation of this work with other strategies and initiatives wherever possible/appropriate. (Wave 2)
- ✓ The IG will uphold a commitment to fostering the crown/Māori partnership as set out in Te Tiriti o Waitangi, and will adhere to the guiding principles agreed for this Strategy. (Wave 1, 2 and 3)



1.2

**We will identify the adaptation options available to us and reach agreement on when and how they will be implemented (Wave 2)**

### Key commitments:

- ✓ Adaptation options will be identified, their dependencies, lead times and trade-offs assessed, and an adaptation pathway map describing how they can be navigated will be drafted. (Wave 2)
- ✓ An ISO14090-aligned adaptation action plan will be developed, with IG agreed pathway options sanctioned for immediate implementation. (Wave 2)
- ✓ A range of key indicators of ecological and socio-economic climate resilience affecting specific groups within the sector, and helping to inform when decision-points arise, will be identified and their status will be monitored on an ongoing basis. (Wave 2)

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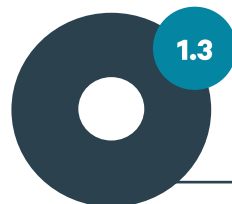
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STRATEGIC GOAL 1



## Specific Objectives:



**We will ensure that our stakeholders understand the risks and opportunities posed by climate change well enough to be able to prioritise and implement adaptation actions (Wave 2)**

### Key commitments:

- ✓ A digital climate change adaptation platform for the seafood sector will be created to facilitate the sharing of adaptation information and knowledge between internal and external stakeholders. (Wave 2)
- ✓ Long term relationships with leading science communicators who focus on the marine sector will be developed and nurtured, reinforcing the internal uptake of climate knowledge and helping to externally communicate the sector's efforts to adapt. (Wave 2)
- ✓ Regional climate change workshops will be convened for seafood stakeholders to exchange knowledge and hear from national and international subject matter experts. (Wave 2)

# Resilient prosperity

*“Our businesses are effectively adapting to disruptive market changes and stewarding marine ecosystems”*

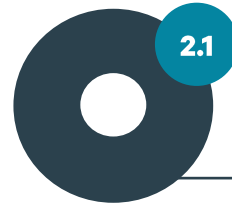
## Why is it important?

Climate change will present the sector with new and changing risks and opportunities. To enhance the seafood sector’s long-term resilience, we must be able to adapt to change. This goal is focused on developing our adaptive capacity, and preparing the sector and its businesses to thrive at the front of the change curve.

## Why do we want to achieve it?

Prosperity and systemic resilience cannot be guaranteed under a ‘business as usual’ paradigm. Proactively preparing for change will maximise the capacity of seafood businesses, the habitats which support them, and the communities they serve, to adapt and thrive under changing climatic conditions.

## Specific Objectives:

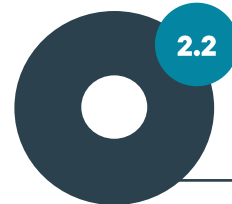


2.1

### **Our business models focus on long-term resilience and purpose-led adaptation (Wave 1 and 2)**

#### Key commitments:

- ✓ A ‘Purpose-led Adaptation’ charter will be developed to codify how this Strategy’s principles will be applied in practical adaptation decision making contexts. The charter will account for actors and organisations of different scales and allow adaptation planning to more readily align with external supporting institutions and funding (e.g. NZTE, MFAT). (Wave 1)
- ✓ Our commercial sector organisations will be benchmarked against leading global frameworks (e.g. UNEP SBF, FutureFit). (Wave 2)
- ✓ A feasibility study to assess the merits of developing a new climate-resilient production standard for Aotearoa (potentially in conjunction with other primary sectors) will be commissioned. (Wave 2)



2.2

### **Our sector is diversifying its methods, products and markets to better cope with climate-related disruption (Wave 1 and 2)**

#### Key commitments:

- ✓ Options to fund ‘Innovation and Diversification’ to provide seed money for pilot projects will be investigated and a shortlist of funding structures recommended to the IG. (Wave 1)
- ✓ Opportunities to diversify markets, product categories and technologies will be investigated via a structured horizon-scanning process, with tangible pilot opportunities to trial actively sought out for IG consideration. (Wave 2)

# Resilient prosperity

*“Our businesses are effectively adapting to disruptive market changes and stewarding marine ecosystems”*

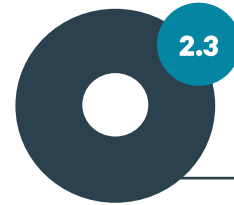
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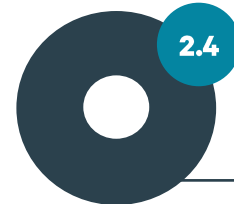


2.3

#### **Our climate change adaptation actions enhance the resilience of a climate-stressed marine environment (Wave 1, 2 and 3)**

##### Key commitments:

- ✓ The outcomes of existing and future pilots of a Te Ao Māori approach to coastal management (informed by mātauranga Māori and science) will be monitored, with lessons learnt and knowledge gained informing adaptation vulnerability assessment (SO 1.2) and option selection (SO 1.3) processes. (Wave 1)
- ✓ The results of fishing and aquacultural practice trials which target ecological resilience gains will be monitored. Those proving to be both ecologically beneficial and economically efficient will be promulgated across the sector on a non-competitive basis. (Wave 1, 2 and 3)



2.4

#### **Our climate change adaptation performance is transparently communicated and converted into long-term increased value (Wave 1)**

##### Key commitments:

- ✓ The status of the socio-economic and environmental indicators of resilience monitored under this Strategy will be disclosed annually. (Wave 1)
- ✓ Emission reductions targets which are achievable by seafood businesses given the technologies and energy options available will be adopted, charting our contributions towards Aotearoa’s 2050 net zero goal. (Wave 1)

# Practical knowledge

*“Our knowledge system supports mātauranga Māori and provides the evidence required for innovation and good decision-making about climate-related risks and opportunities”*

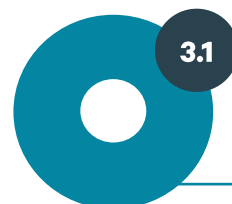
## Why is it important?

Practical, decision-relevant knowledge is key to sound adaptation planning. Working within the constraints of limited time and resources mean that trade-offs will be essential. The prioritisation of what data, information and knowledge is developed must be informed by diverse views, perspectives, and the practical realities of decision making contexts.

## Why do we want to achieve it?

Providing a way of collaboratively developing and sharing knowledge across the sector would minimise repetition of effort, enable the rapid advancement of understanding, and unite stakeholders toward the achievement of our adaptation vision.

## Specific Objectives:

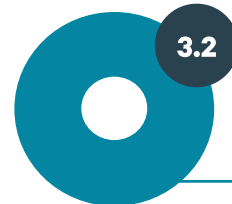


3.1

### Vulnerability to climate change within the sector is assessed by identifying climate-related hazards, assessing exposure to them and gauging sensitivity to their impacts (Wave 1)

#### Key commitments:

- ✓ Vectors of physical and transitional climate change hazard over the short (0-5 year), medium (5-10 year) and long (10 years +) term will be identified and documented, with the timing of subsequent review and reassessment falling in line with the cadence of futures research carried out under SO 3.3. (Wave 1)
- ✓ Spatial and seafood-activity derived differences in exposure to climate change hazards will be assessed and documented, with the timing of subsequent review and reassessment falling in line with the cadence of futures research carried out under SO 3.3. (Wave 1)
- ✓ Sensitivity to climate hazards among different sub-groups within the seafood system will be assessed and documented, providing context-specific sensitivity information to inform adaptation option selection and governance review (SO 4.2) needs. The timing of subsequent review and reassessment will fall in line with the cadence of futures research carried out under SO 3.3. (Wave 1)
- ✓ The baseline findings of climate hazard, exposure and sensitivity assessments will be documented and reported back to the IG, with update reports submitted in line with SO 3.3. (Wave 1)



3.2

### The growth of a collaboratively resourced and holistic seafood adaptation data and information system in Aotearoa is supported (Wave 1, 2 and 3)

#### Key commitments:

- ✓ Different forms and sources of evidence will be integrated within our adaptation vulnerability assessment (SO 1.2) and option selection (SO 1.3) drawing on mātauranga, citizen science and relevant non-climate information. (Wave 1)
- ✓ Aotearoa's seafood data and information provision system will be reviewed, with existing data and sources mapped. Data and information gaps will be identified and prioritised, with a short-list of recommended actions reported back to the IG. (Wave 2)
- ✓ The IG will agree a framework to secure and maintain the funding necessary to implement short-listed data/information gathering actions. (Wave 3)

# Practical knowledge

*“Our knowledge system supports mātauranga Māori and provides the evidence required for innovation and good decision-making about climate-related risks and opportunities”*

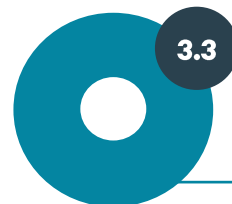
## Why is it important?

Practical, decision-relevant knowledge is key to sound adaptation planning. Working within the constraints of limited time and resources mean that trade-offs will be essential. The prioritisation of what data, information and knowledge is developed must be informed by diverse views, perspectives, and the practical realities of decision making contexts.

## Why do we want to achieve it?

Providing a way of collaboratively developing and sharing knowledge across the sector would minimise repetition of effort, enable the rapid advancement of understanding, and unite stakeholders toward the achievement of our adaptation vision.

### Specific Objectives:

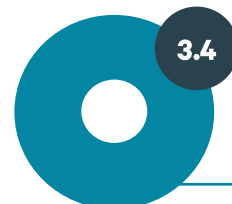


3.3

#### How data and information are used to make adaptation decisions is transparently communicated (Wave 1)

##### Key commitments:

- ✓ Criteria for 'Fit-for-purpose adaptation information' will be recommended, including principles for the handling of uncertainty and the role of precaution in making adaptation decisions. The IG will publicly disclose these criteria when agreed. (Wave 1)
- ✓ The IG will seek legal advice on when and how adaptation information can be shared between stakeholders while allowing competitive independence to be maintained. (Wave 1)



3.4

#### Insights into the evolution of risk and opportunity in the seafood sector are captured, and lessons learnt from adaptation are gathered to inform decision making (Wave 2 and 3)

##### Key commitments:

- ✓ Appropriate criteria for the Monitoring and Evaluation (M&E) of adaptation options implemented under the Strategy will be identified, drawing on global best practice to draft an M&E policy for the IG to review, endorse and subsequently publish. (Wave 2)
- ✓ The plausible evolution of climate-related risk and opportunity in the seafood sector will be analysed via forward looking exploratory futures research techniques. This will be revisited every three years, ensuring new developments and new knowledge inform each reiteration of the analysis. (Wave 3)

# Values -based governance

*“Our legislative, regulatory, and resource management systems reflect our principles, and respond quickly and boldly to the challenges that climate change poses to New Zealand’s marine environment and seafood community”*

## Why is it important?

Physical and transitional climate risk will place additional stress on an already overburdened governance system. Stakeholders from across the seafood community spectrum will therefore need to collaborate with and actively support policymakers as climate change is mainstreamed into legislation, regulation and policy settings.

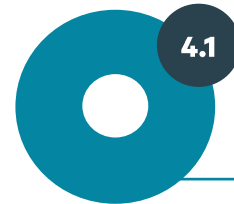
## Why do we want to achieve it?

To enable seafood governance to effectively respond to the demands of physical and transitional climate risk, the principles set out in this Strategy need to guide the seafood sector’s approach and involvement in shaping and working with legislation, regulation and policy.

STRATEGIC GOAL 4



Specific Objectives:

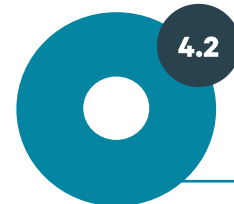


4.1

**Climate-related risk is mainstreamed within regulatory and management-level decision-making (Wave 1 and 3)**

### Key commitments:

- ✓ The IG will advocate for inclusion of climate-related risk as a key strategic consideration across fisheries and marine resource policy settings. (Wave 1)
- ✓ The IG will advocate for the introduction of Key Performance Indicators to better track the climate resilience of Aotearoa’s regulatory and management systems. (Wave 3)



4.2

**The capacity of the legislative, regulatory and management systems to respond to climate change risk and opportunity, and take action to support and enable their improvement, will be regularly assessed (Wave 2 and 3)**

### Key commitments:

- ✓ A tightly scoped ‘rapid review’ of the climate-related adaptive capacity of legislative, regulatory and management systems governing fisheries and aquaculture activities in Aotearoa will be completed. (Wave 2)
- ✓ A study of the adaptive capacity gains offered by Te Tiriti o Waitangi in fishing and aquacultural governance will be completed. (Wave 2)
- ✓ A shortlist of priority changes which would offer climate-related resilience enhancements over current seafood governance settings will be submitted to the IG. (Wave 3)
- ✓ Recommended changes which are endorsed by the IG will be submitted for consideration within relevant decision contexts and processes, with action taken to support and advocate for change. (Wave 3)

# Implementation

04





# Roadmap for implementation

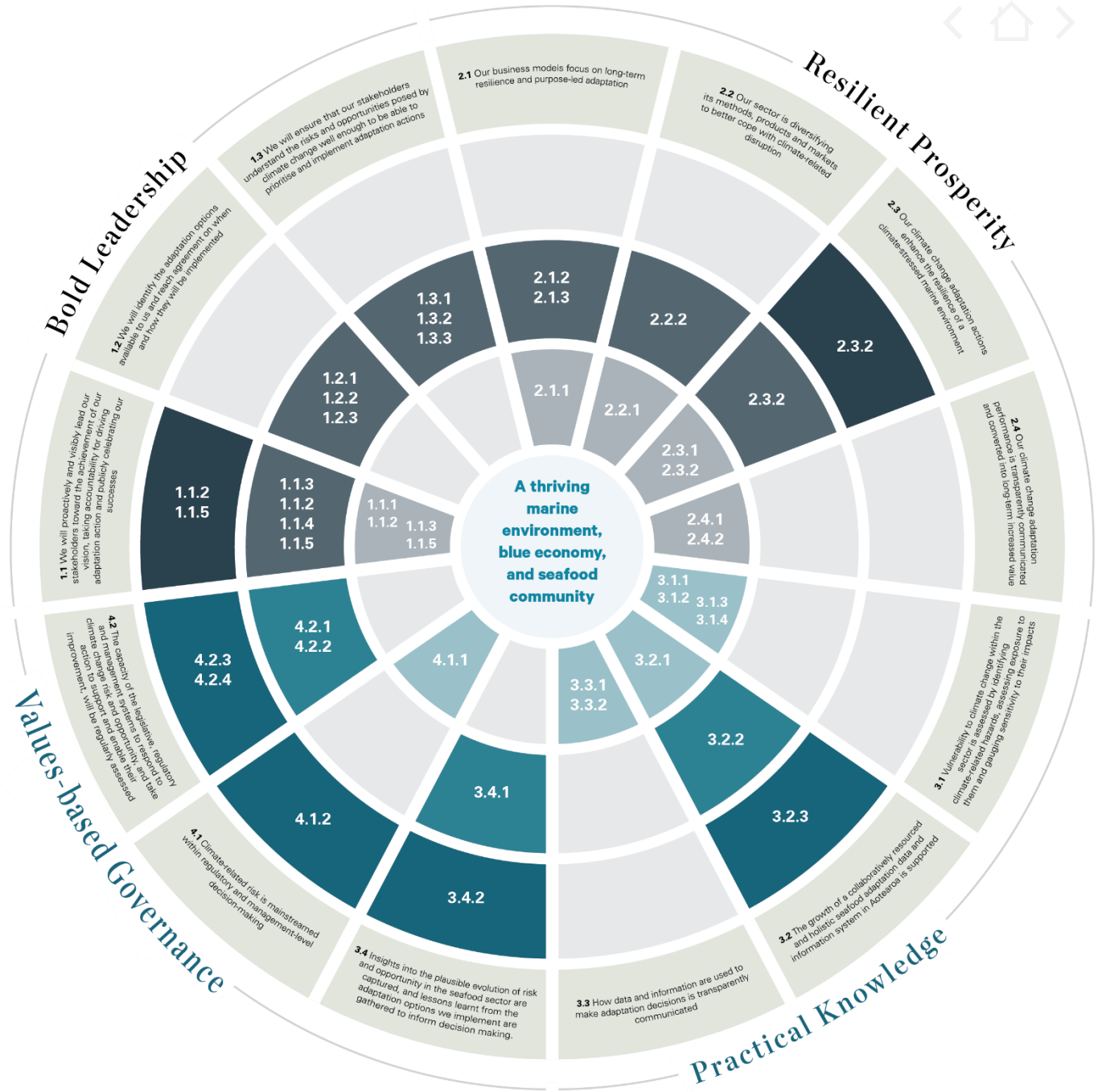
## Overview

The diagram to the right plots Key Commitments across three waves of implementation that describe our intended sequence of activity and targeted completion period, noting that the start date on commitments is not fixed.

**Wave 1** (inner ring): Commitments that should be undertaken immediately as they lay the foundations for future commitments and will be instrumental in progressing the Strategy.

**Wave 2** (middle ring): Commitments that could be actioned in the next sequence to build upon the foundations of Wave 1 commitments. These should be implemented in the next two to three years (2022-2024). Note: this is not a strict sequential order and commitments in Waves 2 and 3 can be implemented at any stage if appropriate.

**Wave 3** (outer ring): Commitments that could be actioned in the next sequence to build upon progress achieved via prior commitments. These should be implemented in four to six years (2025-2027).



# Implementation of specific objectives & key commitments



Strategic Goal	Specific Objective	Key Commitment	Accountable Lead	Accountable Support	Wave	RAG status
1. Bold Leadership	1.1 We will proactively and visibly lead our stakeholders toward the achievement of our vision, taking accountability for driving adaptation action and publicly celebrating our successes	1.1.1 An Implementation Group (IG) drawn from representatives of iwi, the commercial sector, policy makers, science and research providers, environmental NGOs and the financial sector will be formed under an agreed Terms of Reference, with IG decisions requiring a 75% majority to be actioned. The IG will be responsible for governing the implementation of this Strategy and report to the Leadership Group	(TBC representatives from Implementation group)		Wave 1	
		1.1.2 The IG will assume responsibility for the appointment of appropriately resourced working groups to carry out the analytical tasks required under the commitments to follow			Waves 1 – 3	
		1.1.3 The IG will assume responsibility for ensuring the climate adaptation objectives, commitments and actions agreed and documented under this Strategy will be disseminated to key stakeholders, leveraging existing communication channels and creating new ones where necessary to publicise progress			Wave 1	
		1.1.4 The IG will foster strategic partnerships to leverage expert knowledge and facilitate the delivery of the Strategy, connecting the implementation of this work with other strategies and initiatives wherever possible/appropriate			Wave 2	
		1.1.5 The IG will uphold a commitment to fostering the crown/iwi partnership as set out in Te Tiriti o Waitangi, and will adhere to the guiding principles agreed for this Strategy			Waves 1 – 3	
	1.2 We will identify the adaptation options available to us and reach agreement on when and how they will be implemented	1.2.1 Adaptation options will be identified, their dependencies, lead times and trade-offs assessed, and an adaptation pathway map describing how they can be navigated will be drafted			Wave 2	
		1.2.2 An ISO14090-aligned adaptation action plan will be developed, with IG agreed pathway options sanctioned for immediate implementation			Wave 2	
		1.2.3 A range of key indicators of ecological and socio-economic climate resilience affecting specific groups within the sector, and helping to inform when decision-points arise, will be identified and their status will be monitored on an ongoing basis			Wave 2	
	1.3 We will ensure that our stakeholders understand the risks and opportunities posed by climate change well enough to be able to prioritise and implement adaptation actions	1.3.1 A digital climate change adaptation platform for the seafood sector will be created to facilitate the sharing of adaptation information and knowledge between internal and external stakeholders			Wave 2	
		1.3.2 Long term relationships with leading science communicators who focus on the marine sector will be developed and nurtured, reinforcing the internal uptake of climate knowledge and helping to externally communicate the sector's efforts to adapt			Wave 2	
		1.3.3 Regional climate change workshops will be convened for seafood stakeholders to exchange knowledge and hear from national and international subject matter experts.			Wave 2	

# Implementation of specific objectives & key commitments



Strategic Goal	Specific Objective	Key Commitment	Accountable Lead	Accountable Support	Wave	RAG status	
2. Resilient Prosperity	2.1 Our business models focus on long-term resilience and purpose-led adaptation	2.1.1 A 'Purpose-led Adaptation' charter will be developed to codify how this Strategy's principles will be applied in practical adaption decision making contexts. The charter will account for actors and organisations of different scales and allow adaptation planning to more readily align with external supporting institutions and funding (e.g. NZTE, MFAT).			Wave 1		
		2.1.2 Our commercial sector organisations will be benchmarked against leading global frameworks (e.g. UNEP SBF, FutureFit).			Wave 2		
		2.1.3 A feasibility study to assess the merits of developing a new climate-resilient production standard for Aotearoa (potentially in conjunction with other primary sectors) will be commissioned			Wave 2		
	2.2 Our sector is diversifying its methods, products and markets to better cope with climate-related disruption	2.2.1 Options to fund 'Innovation and Diversification' to provide seed money for pilot projects will be investigated and a shortlist of funding structures recommended to the IG.				Wave 1	
		2.2.2 Opportunities to diversify markets, product categories and technologies will be investigated via a structured horizon-scanning process, with tangible pilot opportunities to trial actively sought out for IG consideration.				Wave 2	
	2.3 Our climate change adaptation actions enhance the resilience of a climate-stressed marine environment	2.3.1 The outcomes of existing and future pilots of a Te Ao Māori approach to coastal management (informed by mātauranga Māori and science) will be monitored, with lessons learnt and knowledge gained informing adaptation vulnerability assessment (SO 1.2) and option selection (SO 1.3) processes.				Wave 1	
		2.3.2 The results of fishing and aquacultural practice trials which target ecological resilience gains will be monitored. Those proving to be both ecologically beneficial and economically efficient will be promulgated across the sector on a non-competitive basis.				Wave 3	
	2.4 Our climate change adaptation performance is transparently communicated and converted into long-term increased value	2.4.1 The status of the socio-economic and environmental indicators of resilience monitored under this Strategy will be disclosed annually.				Wave 1	
		2.4.2 Emission reductions targets which are achievable by seafood businesses given the technologies and energy options available will be adopted, charting our contributions towards Aotearoa's 2050 net zero goal.				Wave 1	

# Implementation of specific objectives & key commitments



Strategic Goal	Specific Objective	Key Commitment	Accountable Lead	Accountable Support	Wave	RAG status	
3. Practical Knowledge	3.1 We will assess our vulnerability to climate change by identifying the climate-related hazards we face, assessing our exposure to them and gauging our sensitivity to their impacts	3.1.1 Vectors of physical and transitional climate change hazard over the short (0-5 year), medium (5-10 year) and long (10 years +) term will be identified and documented, with the timing of subsequent review and reassessment falling in line with the cadence of futures research carried out under SO 3.3.			Wave 1		
		3.1.2 Spatial and seafood-activity derived differences in exposure to climate change hazards will be assessed and documented, with the timing of subsequent review and reassessment falling in line with the cadence of futures research carried out under SO 3.3.			Wave 1		
		3.1.3 Sensitivity to climate hazards among different sub-groups within the seafood system will be assessed and documented, providing context-specific sensitivity information to inform adaptation option selection and governance review (SO 4.2) needs. The timing of subsequent review and reassessment will fall in line with the cadence of futures research carried out under SO 3.3.			Wave 1		
		3.1.4 The baseline findings of climate hazard, exposure and sensitivity assessments will be documented and reported back to the IG, with update reports submitted in line with SO 3.3			Wave 1		
	3.2 The growth of a collaboratively resourced and holistic seafood adaptation data and information system in Aotearoa is supported	3.2.1 Different forms and sources of evidence will be integrated within our adaptation vulnerability assessment (SO 1.2) and option selection (SO 1.3) drawing on mātauranga, citizen science and relevant non-climate information.				Wave 1	
		3.2.2 Aotearoa's seafood data and information provision system will be reviewed, with existing data and sources mapped. Data and information gaps will be identified and prioritised, with a short-list of recommended actions reported back to the IG.				Wave 2	
		3.2.3 The IG will agree a framework to secure and maintain the funding necessary to implement short-listed data/information gathering actions.				Wave 3	
	3.3 How data and information are used to make adaptation decisions is transparently communicated	3.3.1 Criteria for 'Fit-for-purpose adaptation information' will be recommended, including principles for the handling of uncertainty and the role of precaution in making adaptation decisions. The IG will publicly disclose these criteria when agreed.				Wave 1	
		3.3.2 The IG will seek legal advice on when and how adaptation information can be shared between stakeholders while allowing competitive independence to be maintained.				Wave 1	
	3.4 Insights into the evolution of risk and opportunity in the seafood sector are captured, and lessons learnt from adaptation are gathered to inform decision making	3.4.1 Appropriate criteria for the Monitoring and Evaluation (M&E) of adaptation options implemented under the Strategy will be identified, drawing on global best practice to draft an M&E policy for the IG to review, endorse and subsequently publish.				Wave 2	
		3.4.2 The plausible evolution of climate-related risk and opportunity in the seafood sector will be analysed via forward looking exploratory futures research techniques. This will be revisited every three years, ensuring new developments and new knowledge inform each reiteration of the analysis.				Wave 3	

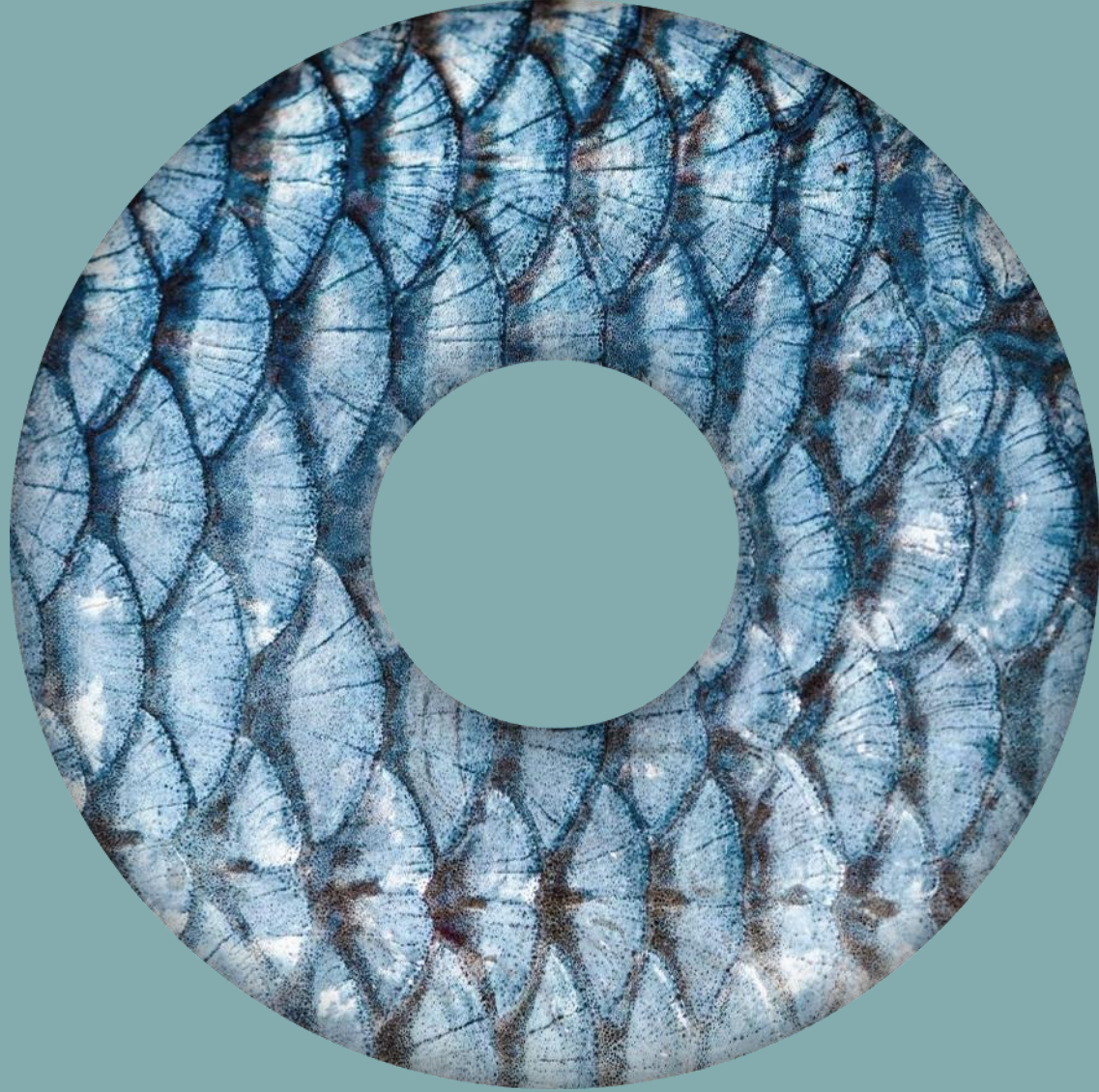
# Implementation of specific objectives & key commitments



Strategic Goal	Specific Objective	Key Commitment	Accountable Lead	Accountable Support	Wave	RAG status	
4. Values-based governance	4.1 Climate-related risk is mainstreamed within regulatory and management-level decision-making	4.1.1 The IG will advocate for inclusion of climate-related risk as a key strategic consideration across fisheries and marine resource policy settings.			Wave 1		
		4.1.2 The IG will advocate for the introduction of Key Performance Indicators to better track the climate resilience of Aotearoa's regulatory and management systems.			Wave 3		
	4.2 The capacity of the legislative, regulatory and management systems to respond to climate change risk and opportunity, and take action to support and enable their improvement, will be regularly assessed	4.2.1 A tightly scoped 'rapid review' of the climate-related adaptive capacity of legislative, regulatory and management systems governing fisheries and aquaculture activities in Aotearoa will be completed.				Wave 2	
		4.2.2 A study of the adaptive capacity gains offered by Te Tiriti o Waitangi in fishing and aquacultural governance will be completed.				Wave 2	
		4.2.3 A shortlist of priority changes which would offer climate-related resilience enhancements over current seafood governance settings will be submitted to the IG.				Wave 3	
		4.2.4 Recommended changes which are endorsed by the IG will be submitted for consideration within relevant decision contexts and processes, with action taken to support and advocate for change.				Wave 3	

# Appendices

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# Appendix 1: Glossary of key terms



Term	Definition
<b>Action plan</b>	An action plan describes <i>how</i> an organisation or sector will move from where it is now to where it wants to be.
<b>Adaptation</b>	The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.
<b>Climate change</b>	Climate change refers to a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing, such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use.
<b>Climate-related opportunity</b>	<p>Climate-related opportunity refers to the potential positive impacts related to climate change on an organization. Efforts to mitigate and adapt to climate change can produce opportunities for organizations, such as through resource efficiency and cost savings, the adoption and utilization of low-emission energy sources, the development of new products and services, and building resilience along the supply chain. Climate-related opportunities will vary depending on the region, market, and industry in which an organization operates.</p> <p>Notably, when organisations are timely in seizing climate-related opportunities and managing climate-related risks, this strengthens resilience (see definition). Resilience is an climate-related opportunity in itself, especially for organisations with long-lived fixed assets, extensive supply networks, and/or dependence on natural resources in their value chain.</p>
<b>Climate-related risk</b>	Climate-related risk refers to the potential negative impacts of climate change on an organization. Physical risks emanating from climate change can be event-driven ('acute') such as increased severity of extreme weather events (e.g. cyclones, droughts, floods, and fires). They can also relate to longer-term shifts ('chronic') in precipitation and temperature and increased variability in weather patterns (e.g. sea level rise). Climate-related risks can also be associated with the transition to a lower-carbon global economy, the most common of which relate to policy and legal actions, technology changes, market responses, reputational considerations, and access to capital.
<b>Mitigation</b>	A human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs).
<b>Resilience</b>	The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.
<b>Strategy</b>	A strategy is a solution for moving from where an organisation or sector is now to where it wants to be. As such, a strategy sets out the conditions (e.g. people, policies, and processes) that an organisation or sector believes will enable it to achieve an end. A strategy does not specifically say <i>how</i> an organisation or sector will arrive at its desired end - that is the purpose of an action plan.

# Appendix 2: Co-Chairs and Leadership group



**Maru Samuels**

CE, Iwi Collective Partnership  
*(Co-Chair)*



**Lisa te Heuheu**

CE, Te Ohu Kai Moana



**Doug Paulin**

CEO, Sealord



**Todd Charteris**

CEO, RaboBankNZ



**Andre Gargiulo**

CCO, Sanford



**Dan Bolger**

D-DG, Fisheries NZ  
*(Co-Chair)*



**John Morgan**

CEO, NIWA



**Volker Kuntzsch**

CEO, Cawthron



**Livia Esterhazy**

CEO, WWF



**Gary Hooper**

CEO, AquacultureNZ



# Appendix 3: Advisory group

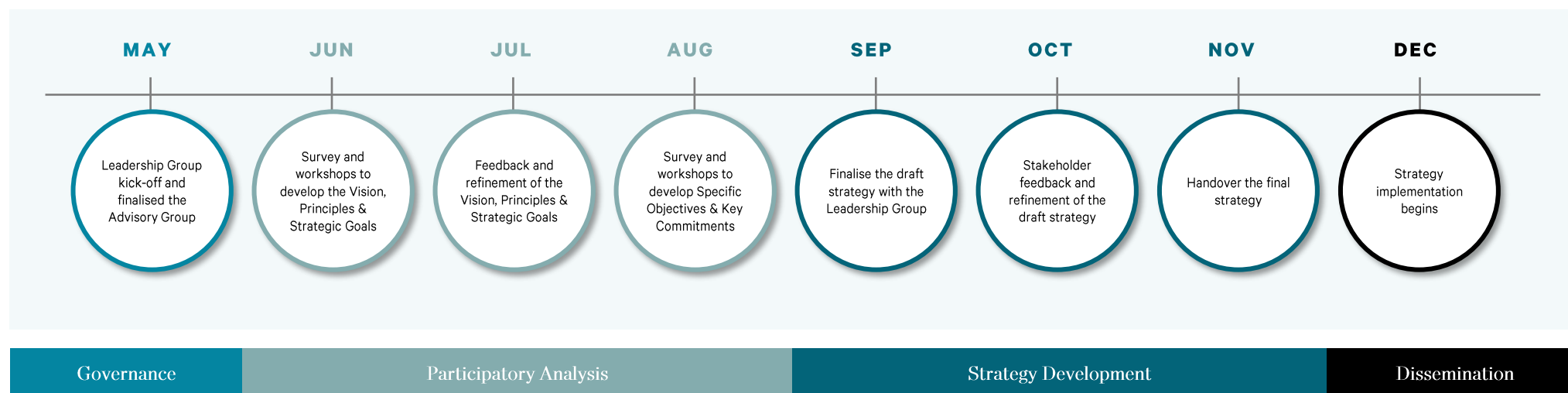


Name	Title	Organisation	Sector
Rob Murdoch	General Manager, Research	NIWA	Science/research
Matt Dunn	Principal Scientist – Fisheries	NIWA	Science/research
Matt Pinkerton	Principal Scientist – Marine Ecology	NIWA	Science/research
Serean Adams	Aquaculture Group Manager	Cawthron	Science/research
Chris Cornelisen	Senior position – involved in NSC Sustainable Seas	Cawthron	Science/research
Nick King	Senior position – involved in ocean aquaculture scene	Cawthron	Science/research
Mike Packer	Senior Research Scientist – Algal Biotechnology	Cawthron	Science/research
Maren Wellenreuther	Science Group Leader, Seafood Production, Seafood Technologies	Plant & Food Research	Science/research
Shelton Harley	Principal Advisor – Operations and Innovation, FNZ	MPI	Gov/policy
Mary Livingstone	Principal Advisor – Aquatic Environment Science, FNZ	MPI	Gov/policy
Marjan van den Belt	Ecological economist	MPI	Gov/policy
Stuart Brodie	Policy Director	MfE	Gov/policy
Pierre Tellier	Senior Analyst	MfE	Gov/policy
Jonathan Peacey	NZ Country Director	TNC	NGO
Bubba Cook	Senior Fisheries Programme Officer	World Wildlife Fund	NGO
Michelle Cherrington	Group Communications Manager	Moana	Iwi/commercial
Nathan Reid	Quota and Resource Manager	Moana	Iwi/commercial
Dave Taylor	Technical Director	AquacultureNZ	Commercial
Peter Longdill	General Manager – Sustainability	Sanford	Commercial
Jeremy Helson	Chief Executive	Seafood NZ	Commercial
Charles Heaphy	Technical Manager, Fishing Operations	Sealord	Commercial
Tom Sturgess	Investor, CH4	LS	Commercial
Katherine Short	Partner	Terra Moana	Commercial
Tony Craig	Partner	Terra Moana	Commercial

# Appendix 4: Development process



This Seafood Sector Adaptation Strategy was developed in a phased approach as outlined below. The strategy development process was informed by two complementary methodologies: Theory Of Change and Design Thinking.





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**The  
Aotearoa  
Circle**

**Mā te Kaitiakitanga  
ko te Tōnuitanga**  
Prosperity Through  
Guardianship