



Opportunities Report

Tackling plastic waste in aquaculture



Fisheries New Zealand
Tini a Tangaroa

Ministry for Primary Industries
Manatū Ahu Matua



Aquaculture
New Zealand



**Sustainable
Business
Network**



01 Foreword

Hon Stuart Nash
Minister of Fisheries
Member of New Zealand Parliament

The Government's Aquaculture Strategy sets a vision that New Zealand is globally recognised as a world-leader in sustainable and innovative aquaculture management across the value chain. The Strategy includes an objective to partner with the aquaculture industry on a plan to reduce emissions and waste across all parts of their business.

I am pleased to be able to support the aquaculture industry in its work with the Sustainable Business Network to better understand its plastics use and the opportunities it has to minimise plastics waste in aquaculture. By tackling this challenge head-on, our aquaculture industry is clearly demonstrating its commitment to sustainability, innovation, and improved environmental performance.

Taking action on plastics is a challenge shared by all New Zealanders in the journey towards building a low waste and low emissions economy. The response to the impact of COVID-19 requires sectors to work together to drive our economic recovery in smarter and more sustainable ways, and I commend the aquaculture industry for taking this step in addressing plastics waste.

Gary Hooper
Chief Executive Officer
Aquaculture New Zealand

The New Zealand aquaculture industry is a band of 3,000 Kiwis dedicated to sustainably producing the world's best seafood. Looking after our waterways is part of the job and we are always looking to improve our environmental performance.

Plastic waste has emerged as a global issue and we're keen to play our part and reduce plastic waste where possible.

This workshop was an essential first step in bringing industry together with experts in plastic manufacturing and recycling to identify areas we can improve by fine-tuning existing initiatives and implementing new programmes.

We see this as a part of our journey of continual improvement, one that will strengthen our green credentials and see the industry recognised globally for leading the way in reducing plastic waste across the production chain.

James Griffin
General Manager, Projects & Advisory
Sustainable Business Network

The Sustainable Business Network is committed to creating a more circular economy in New Zealand where resources are never abandoned to become waste and products are designed to be safe and easy to manage in cycles of production and reproduction.

It is fantastic, therefore, to use a circular economy lens to systematically address the challenges and embrace the opportunities associated with tackling plastic waste in aquaculture. Although the work represents an initial step as a sector, it is a crucial one to take to maintain the global leadership position in environmental best practice and reputation.

Plastic waste and pollution have become one of the key environmental challenges we face as a society. They represent the broader issues associated with our predominant take-make-waste linear economy. The sector is taking the challenge seriously and the Sustainable Business Network is very much looking forward to seeing the vision outlined via this work come to fruition.



02 Introduction



Aquaculture New Zealand and the Ministry for Primary Industries (MPI) have partnered with the Sustainable Business Network (SBN) to work together to minimise plastic waste in New Zealand aquaculture.

This initiative represents a first step by the industry to systematically address plastic waste as a sector.

This summary provides an overview of the key opportunities

to address plastic waste based on desktop research, a series of interviews and a workshop with SBN, industry participants and other experts. In total SBN interviewed 20 stakeholders from across the aquaculture industry and over 40 stakeholders participated in a workshop.

Our focus is on three key products: King Salmon, Greenshell Mussels and Pacific Oysters.

The Sustainable Business Network is committed to transitioning New Zealand to a [circular economy](#) where resources are never abandoned to become waste. Products are designed to be safe and easy to manage in cycles of production and reproduction.

We have used a three element framework based on circular economy principles for addressing plastic waste. This was created by the Ellen MacArthur Foundation, [New Plastics Economy](#) project.

Eliminate the plastic we don't need.

Innovate to ensure the plastics we do need are reusable, recyclable or compostable.

Circulate all plastic items we use to keep them in the economy and out of the environment.



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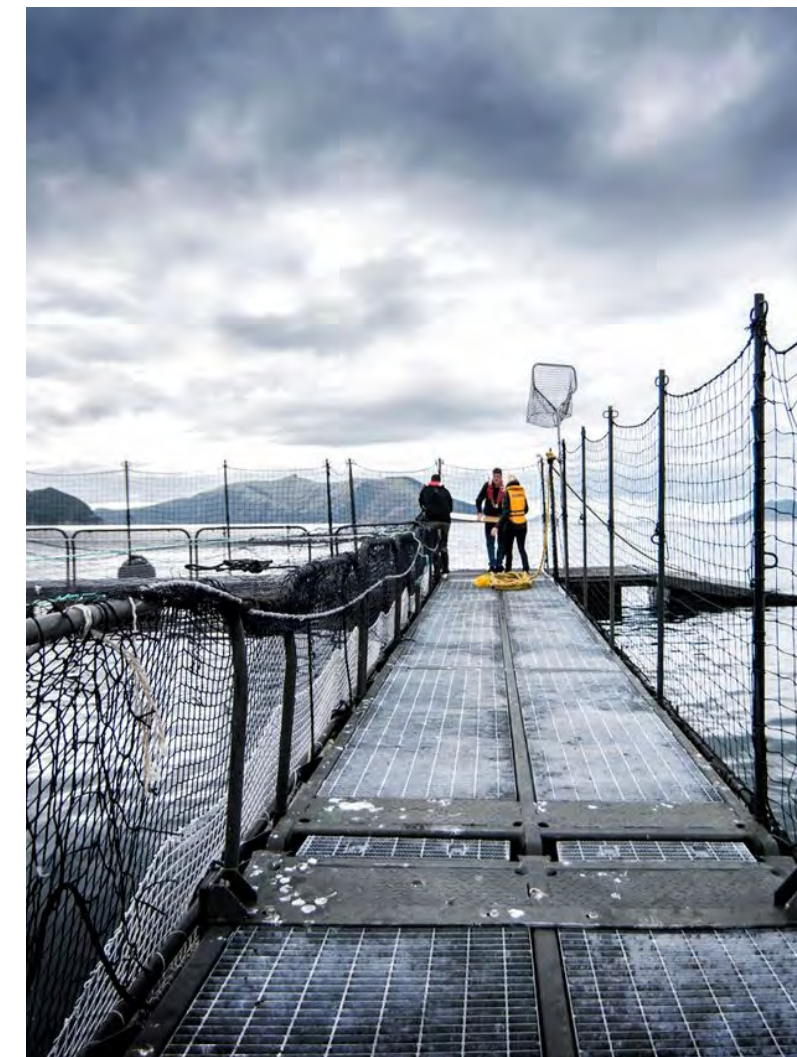
Why now?

Why do we need to act on plastics?

Plastics have become ubiquitous across all areas of life. The material offers many benefits including strength, durability, weight and cost. However, much of the plastic used has been designed and manufactured with little thought for the non-renewable resources they use or what happens to them at the end of their life. A linear (take-make-waste) economy approach has resulted in massive amounts of plastic waste sent to landfill or lost to the environment. The Ellen MacArthur Foundation estimated that business as usual will mean more plastic in our oceans than fish by weight by 2050.¹

Currently, plastics are used in all aspects of aquaculture. They have helped improve the reliability and longevity of equipment. Their light weight reduces handling and associated costs. Their strength alleviates the costs of breakage. Various resin combinations provide the durability needed in very harsh marine and freshwater environments. The problem

occurs when these qualities are combined with improper waste management. Then that same durability can lead to long term contamination of land, freshwater and marine environments.



Despite mitigation efforts, the aquaculture industry acknowledges the occurrence of accidental plastic loss (e.g. equipment coming loose) and unavoidable loss (e.g.

degradation of materials over time). There are already some great initiatives underway, which include training programmes, beach clean ups and recovery programmes. The industry is, however, keen to address issues at source and identify technical solutions.

For aquaculture equipment, end of life solutions are made even more difficult. Many long life materials, such as ropes, floats, nets and baskets are difficult to clean, due to biofouling. This often makes them less suitable for recycling or reuse.

The presence and awareness of microplastics in our marine and freshwater environments continues to grow. However, information is currently relatively limited. For the aquaculture industry, operating in environments where microplastics exist, there's particular interest in not adding to the problem and understanding potential production, health and biosecurity risks.

¹ https://www.ellenmacarthurfoundation.org/assets/downloads/publications/NPEC-Hybrid_English_22-11-17_Digital.pdf



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Moving forward – a vision for 2025

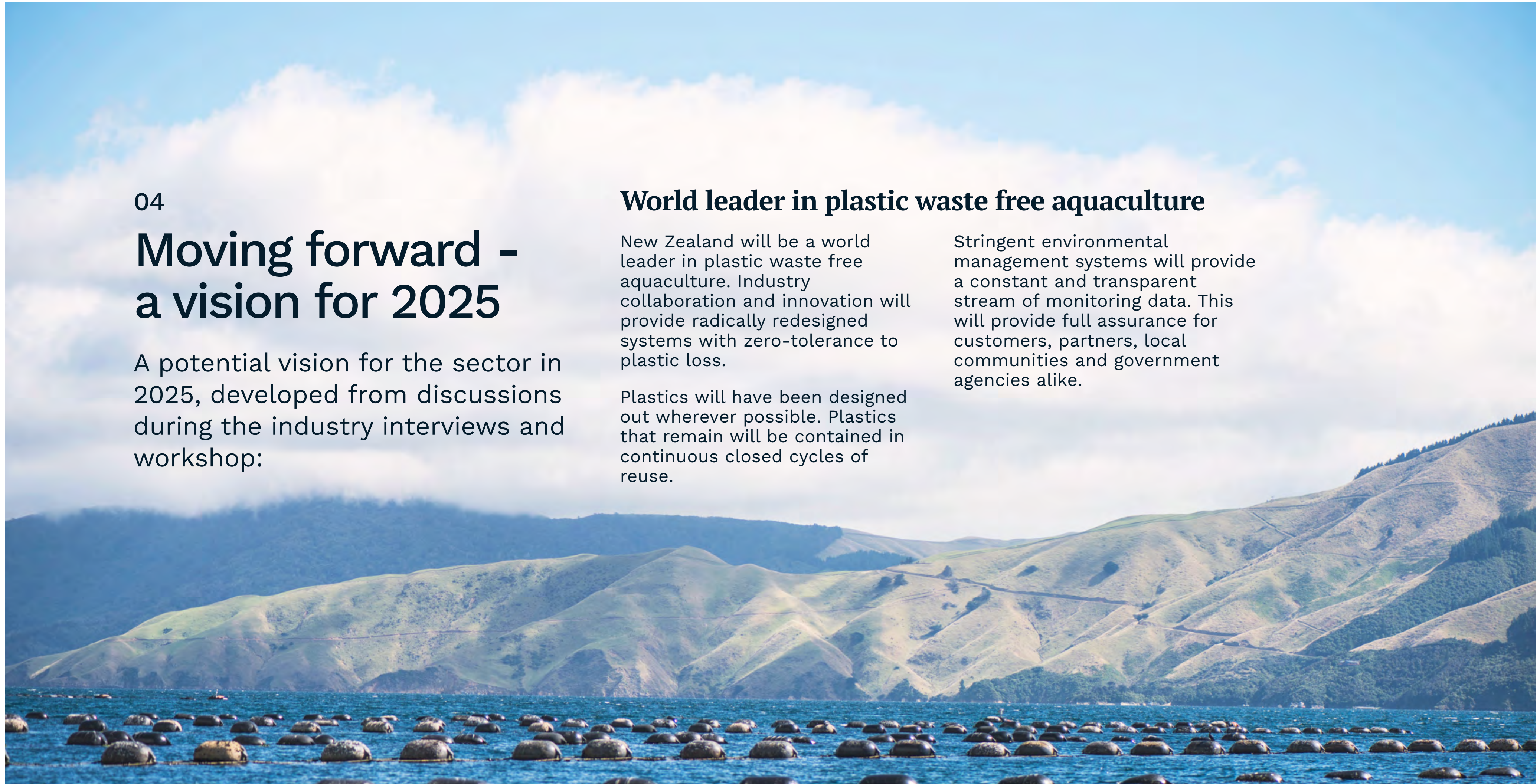
A potential vision for the sector in 2025, developed from discussions during the industry interviews and workshop:

World leader in plastic waste free aquaculture

New Zealand will be a world leader in plastic waste free aquaculture. Industry collaboration and innovation will provide radically redesigned systems with zero-tolerance to plastic loss.

Plastics will have been designed out wherever possible. Plastics that remain will be contained in continuous closed cycles of reuse.

Stringent environmental management systems will provide a constant and transparent stream of monitoring data. This will provide full assurance for customers, partners, local communities and government agencies alike.





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Areas already in motion

Highlights of initiatives currently underway.

A+ New Zealand Sustainable Aquaculture

This is a sustainable management framework. It enables the New Zealand aquaculture industry to better engage with local communities and continuously improve its environmental practices.

Pledges against plastic waste

Sanford's WHATPLASTIC? programme is a great example of using a pledge to reduce a company's plastic use, with the aim of a 70% reduction by 2025².

Research and development into alternative bio materials

Scion is capable of testing marine biodegradation to international standards. It is developing renewable and locally-sourced biomaterials in partnerships with the aquaculture industry.

Addressing plastic packaging

Extensive packaging work is underway. For example, alternatives to polystyrene chill boxes are being explored and



trialled throughout the industry. These include Zealafoam, Woolcool, FishCap, TempGuard and more. New Zealand King Salmon are a signatory to the New Plastics Economy Global Commitment with targets and work underway to address plastic packaging waste. SBN is assisting organisations in the transition to a circular economy for plastic packaging through the Plastic Packaging Circular Innovation programme.

Environmental programmes

The Marine Farming Association's Environmental Programme includes the facilitation of co-ordinated beach clean-ups and associated data collection of plastic debris.

Float recycling

Emerging from the Smart+Connected Aquaculture 2018 workshop, representatives from key mussel producing companies teamed up to identify how to recycle floats. Floats are cut in half and sent on the trailers to COMSPEC in Christchurch. They are cleaned, shredded and extruded into pellets. The recycled pelletised material is shipped to Vision Plastics, which is co-ordinating deliveries to the recycler. The resulting material is used in pipes, road material, protection for underground power cables and other products.

² <https://www.sanford.co.nz/assets/announcements/Sanford-Annual-Report-2018-web.pdf>



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Key opportunities to advance

Enabling the vision with co-ordinated action: **a 2025 commitment.**

Aim:

- **Establish an industry led 2025 plastic waste commitment.**

This would provide focus and a strategic framework to move forward.

A commitment would need to be part of a comprehensive sector led and supported plan, with specific targets for elimination, reduction, reuse and recycling.



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Specific opportunities

There were over 60 opportunities identified during the interviews and workshop. The following are the highlights, selected for immediate impact.

Mussels

Upscaling the float recycling scheme.

Aim

- Every float produced by the industry is recycled at end of life.

Key next steps

Secure initial funding and develop economical model for all stakeholders (farms, processors, recyclers). Drive collaborative engagement through Aquaculture New Zealand (AQNZ), farmers and recyclers to scale up this initiative sector-wide.

First step

AQNZ to set up discussion with Marine Farming Association (MFA) and recyclers to identify specific barriers to scaling operations.

Developing new float attachments.

Aims

- No lashings/ties lost to the environment.
- Minimising/eliminating the landfilling of ties and lashings.

Key next steps

Engaging key stakeholders and securing the required funding and resourcing to enable proper research, open source solutions and incentives for farmers to put them into action.

First step

Connect all those working on alternatives in the sector (biomaterials, hemp, steel, clamping floats) to coordinate and collaborate.





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Specific opportunities

Salmon

Addressing processing & distribution plastics.

Aims

- No liners to be used in distribution packaging (polyboxes or replacements).
- Establish a range of recycling facilities.
- 50% reduction in PPE consumption.

Key next steps

Formalise the issues into an agreed plan, develop designs beyond straight substitution, collaborate for industry-wide solutions and review post Covid-19 PPE needs.

First step

Establish a sub-sector forum.





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Specific opportunities

Oysters

Understanding the full environmental cost versus benefits of materials (including plastics and alternatives) used in farming practices via a life cycle assessment (LCA).

Aims

- **Determine the environmental impacts versus benefits of different material types, including plastics and alternatives.**

Key next steps

Understand the information required, identify key and willing stakeholders and form a working group with a view to identifying initial sources of funding.

First step

Establish business case for funding.

Eliminate plastic packaging by selling the oysters whole (unshucked) by educating NZ consumers.

Aims

- **Minimise use of plastic packaging across the supply chain.**

Key next steps

Educate consumers about new product offerings and collaborate across the supply chain on their production, distribution and marketing.

First step

Establish an industry wide group, including retailers, to work through the details.

Stop using pegs

Aims

- **Plastic pegs eliminated, or replaced with a marine-safe, biodegradable alternative.**

Key next steps

Educate farmers on the need for change, incentivise the elimination of pegs and open source the alternatives.





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Conclusion



There is a shared aspiration to embrace the opportunities presented by the need to tackle plastic waste in the industry. This can form the basis to consolidate and expand on the innovative collaborations already underway, and to create new ones. It is imperative that we underpin these aspirations with a clear commitment to goals in a given timeframe. SBN recommends further work on a 2025 Plastics in NZ Aquaculture Commitment for the entire industry. This would build on the work done here, and the overarching framework we have begun to develop.

This is an opportunity for New Zealand aquaculture, to get ahead of any overseas competition, maintaining its presence as a leader in sustainability. Integrating the principles of Te Man o te Wai will also help protect the mauri of water – its life-supporting capacity.

There are ample reasons to be confident the industry can experience major successes in this area in the coming months and years, and meet its aspiration of becoming a world leading plastic waste free system.

“It was really great to hear how far ahead they actually are in their journey. Definitely still work to do but they’re already on the pathway which is more than can be said for a lot of sectors!”

Rachel Barker, CEO, Plastics NZ



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Stakeholders involved

List of interviewees – Stage 1: Stakeholder engagement

Dave Taylor	Aquaculture NZ
Karen Mant	Aquaculture NZ
Zane Charman	Aquaculture Projects
Mike Holland	Clearwater Mussels
Tom Hollings	Coromandel Marine Farming Association
Karl French	High Country Salmon
Dean Condon	Kono
Ned Wells	Marine Farming Association
Olga Pantos	ESR
Maegen Blom	Mills Bay Mussels
Vince Syddall	Moana
Mark Preece	New Zealand King Salmon/NZ Salmon Farmers Association
Stephanie Hopkins	MPI - NZ Fisheries
Joe Franklin Jnr	Quality Equipment
Jaco Swart	Sanford Limited
Mike Mandeno	Sanford Limited
James Higgins	Sanford Limited
Kate Parker	Scion
Dawn Smith	Scion
Lanice Waitai	Taniwha Oysters Limited
Sally Spencer	Vision Plastics
Robert Fowler	COMSPEC

List of Attendees – Stage 2: workshop

Stephanie Hopkins	MPI – Fisheries NZ
Beth Davie	MPI – Agriculture and Investment Services
Dave Taylor	Aquaculture NZ
Karen Mant	Aquaculture NZ
Zane Charman	Aquaculture Projects
Ned Wells	Marine Farming Association
Paul Creswell	MPI – Fisheries NZ
Dean Condon	Kono
Peter Vitasovich	Whakatohea Mussels (Opotiki) Ltd

Peter James	James Marine
Scott Gillanders	Maclab
Mark Preece	New Zealand King Salmon
Jaco Swart	Sanford
Jemma McCowan	New Zealand King Salmon
Rick Ramsay	Mount Cook Alpine Salmon
Ben Divett	Akaroa Salmon
Aine O'Neill	New Zealand King Salmon
Pene Waitai	Taniwha Oysters Limited
Tom Hollings	Coromandel Marine Farming Association
Will McKay	Biomarine
Emmanuel Malpot	Moana
Michelle Cherrington	Moana
Peter Longdill	Sanford
Paul Gurr	New Zealand King Salmon
Owen Fisher	New Zealand King Salmon
Sally spencer	Vision Plastics
Hamish Oakley	Donaghys
Baz Henare	Cookes
Matt Wooley	Cookes
Olga Pantos	ESR
Kate Parker	Scion
Dawn Smith	Scion
Marie Joo Le Guen	Scion
Sarah Heine	Biopolymer Network Limited
Rachel Barker	Plastics NZ
Robert Fowler	COMSPEC
Liz Butcher	Ministry for the Environment
Rachel Chiaroni-Clarke	Office of PMCSA
Stephen Harris	Maui’s Ark
Julien Vignier	Cawthron Institute
Sandra Evers	Aroma Aquaculture

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