

Te Hapū o Ngāti Wheke, Canterbury Regional Council (Environment Canterbury), Lyttelton Port Company Limited, Christchurch City Council, and Te Rūnanga o Ngāi Tahu with Tāngata Tiaki present:



# WHAKA-ORA

Heathy Harbour, Ki Uta Ki Tai

## Whakaraupō/Lyttelton Harbour Catchment Management Plan

Draft for consultation November 2017

A catchment Management Plan to restore the ecological and cultural health of Whakaraupō/Lyttelton Harbour as mahinga kai – wrapping our environment in a protective korowai for us, and our children after us

Whakataua, whakataua  
Whakatau a Rangi e tū nei  
Whakatau a Papa e takoto nei  
Kia wātea, kia māmā  
Te wairua i te ara takata  
O te mauri a Tāne-nui-ā-rangi  
A Haumia-tiketike me Rongo  
Ko Tiki i ahu mai i Hawaiiki  
Ko te mauri tēnā i kawea ai  
Te toko mauri o te tapu  
He mauri nō Rongo ki te whaiao  
Tipua-ā-nuku  
Tipua-ā-Rangi  
Kia whakamaua ki tina  
Tina  
Haumi e  
Hui e  
Tāiki





# Contents

Karakia .....	2
Executive Summary .....	4
Introduction .....	6
<b>Part I</b> .....	8
Kaupapa/Purpose of Plan – Mahinga Kai .....	8
Whāinga/Goals .....	8
Pou/Guiding Principles .....	9
The Partners .....	9
The Whakaraupō/Lyttelton Catchment .....	11
<b>Part II</b> .....	12
High outcrops and Forests .....	12
Hills and Lowlands .....	14
Streams .....	16
Wetlands and Saltmarsh .....	18
Taihua/Foreshore .....	20
Harbour .....	22
<b>Part III</b> .....	26
Priority Projects .....	26
Complete List of Actions .....	28
Accountability and Review .....	40



# Executive Summary

Whakaraupō/Lyttelton Harbour is an important place for many different people: the mana whenua of Ngāti Wheke, the residents of all of Whakaraupō/Lyttelton Harbour's bays, the employees and wider Lyttelton Port community, the tourists and visitors that visit our parks and walkways and take a break at Lyttelton's great eateries, and the business owners working within the harbour. We all share a love for this special place, and a love for engaging with it. This engagement can look like gathering seafood in the shallows and streams, walking our favourite tracks in the hills with our children, showing our family and friends our favourite beaches, or sailing and paddling out in the harbour to get to our favourite fishing spots. Mahinga kai is a concept that is important to the whole Whakaraupō/Lyttelton Harbour community – although we all may call it different things. It is a term that is used by mana whenua to represent their customary harvesting practices, and all activities, places and relationships related to this, but it also speaks about things everyone who calls Whakaraupō/Lyttelton Harbour home do. We all have a desire and a responsibility to ensure that Whakaraupō/Lyttelton Harbour is looked after so that those who come after us can also engage in these mahinga kai activities into the future.

*Whaka-Ora, Healthy Harbour* sets out a way forward for all of us as a community to ensure that the ecological and cultural health of Whakaraupō/Lyttelton Harbour as mahinga kai is restored for us and our children after us. The key purpose of this plan is to ensure that Whakaraupō/Lyttelton Harbour is a healthy, abundant, and interconnected environment for people to practice mahinga kai – however that may look to them.

The concept of 'ki uta, ki tai' has been used to look across the whole harbour from the high outcrops to the deep harbour waters and set aspirational goals for where we want Whakaraupō/Lyttelton Harbour to be in the future. After comparing this aspirational state with the current state of the environment we have then identified some key focus areas in which we can undertake actions to move us toward where we want to be. These actions focus on some key areas: erosion and sedimentation, pollution, terrestrial indigenous biodiversity, and marine indigenous biodiversity; and are being addressed in multiple ways including through practical projects, research projects, monitoring programmes, changes to regulation and legislation, and education initiatives. The actions will be tracked annually to ensure that we are doing what we said we would, and will be reviewed every three years so that we are continually moving toward a better future for our harbour.

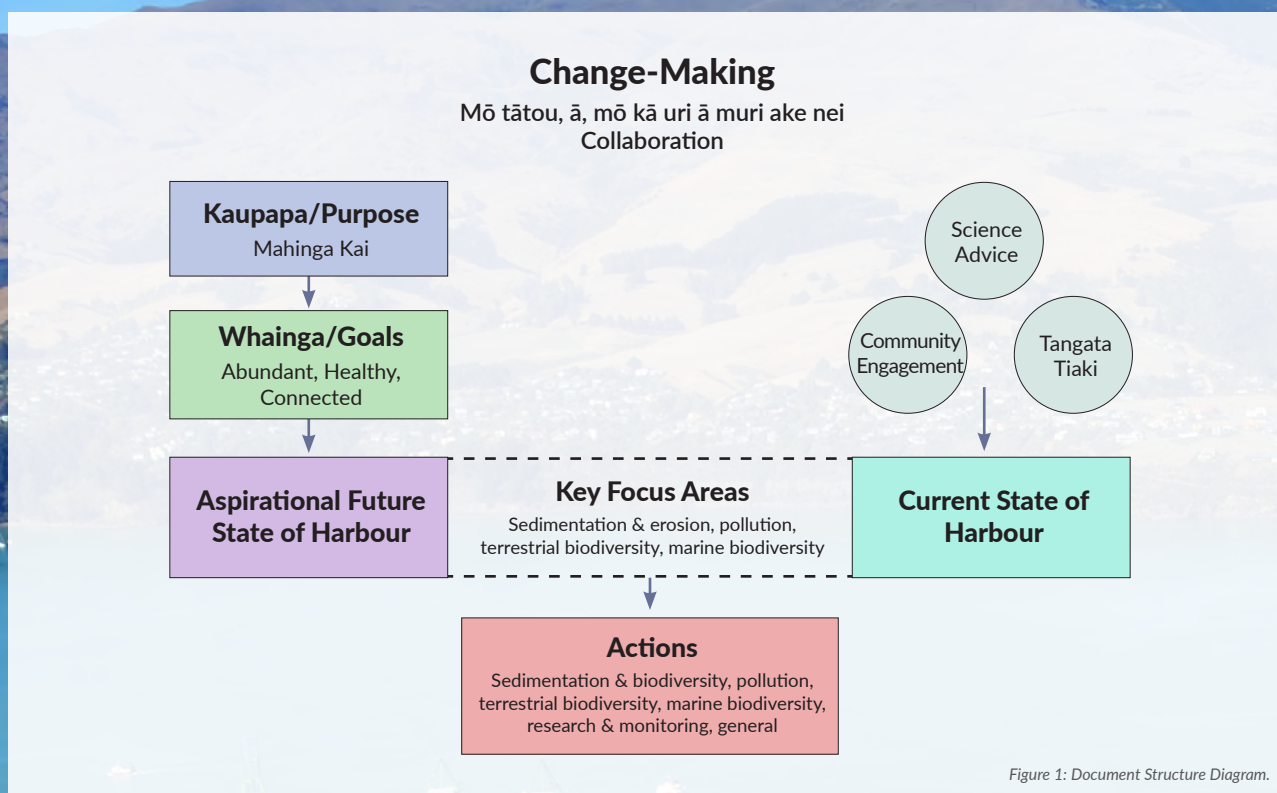


Figure 1: Document Structure Diagram.



Three key pou – or guiding principles – were chosen for this plan. They have influenced the decisions made throughout this document. These pou are:

### Change-making

The idea that everyone can be a change-maker with the power to influence the future of Whakaraupō/Lyttelton Harbour, and that we all must change our habits for the sake of our harbour

### 'Mō tātou, ā, mō kā uri ā muri ake nei' (for us and our children after us)

The idea that in this first version of the plan we need to focus on laying a foundation for those who will be fighting for our harbour in the future

### Collaboration

The idea that we must all work together to achieve our lofty goal of restoring the cultural and ecological health of Whakaraupō/Lyttelton Harbour for mahinga kai

We have also used the imagery of a korowai (traditional cloak) throughout this plan to represent the way we are caring for and protecting our harbour through our actions.

We acknowledge that many groups and individuals who already have, and are, working hard to restore and protect our harbour, and we hope that *Whaka-ora, Healthy Harbour* supports them to continue their great work. We also hope that it helps to build a strong relationship between the different groups including mana whenua, the wider Whakaraupō/ Lyttelton Harbour community, the Port, and councils so that we can work together to achieve more than we ever could working alone.



# Introduction

Whakaraupō/Lyttelton Harbour is a taonga (treasure) to those that live, work, and play in its waters, on its beaches, and along its ridges. Like all treasures, it is important to care for and protect the harbour and its wider catchment so that it can be enjoyed by us and our children after us. In Māori culture the wrapping of a korowai – a beautiful hand-woven cloak- around something indicates its importance and protection. This plan enables the Whakaraupō/Lyttelton Harbour community to weave a korowai that will protect and support this special place to thrive and grow in the future.

The Lyttelton Port Recovery Plan (CERA, 2015) records a commitment by Canterbury Regional Council (Environment Canterbury), Lyttelton Port Company Limited, Te Hapū o Ngāti Wheke, Christchurch City Council and Te Rūnanga o Ngāi Tahu with Tāngata Tiaki (the Partners) to “work together to develop a catchment management plan for Whakaraupō/Lyttelton Harbour in accordance with the philosophy ki uta ki tai (from the mountains to the sea)”. The Partners have committed that the plan will aim to “restore the ecological and cultural health of Whakaraupō/Lyttelton Harbour as mahinga kai”, whilst also addressing “other environmental, cultural and social concerns, including the needs of recreational users, as well as the needs of a working port” (LPRP 5.1).

This plan is non-statutory, and has been written with the community of Whakaraupō/Lyttelton Harbour – both those who call it home, and those for whom it is a home away from home – in mind. For this reason we have chosen to write it in a way that allows you – the community - to pick up, read, understand, and take ownership of this plan – not to sit on the shelves of council planners. First, we highlight the key kaupapa (or purpose) of this plan: mahinga kai. The concept of mahinga kai is broken down into the three clear goals (or whāinga) of ensuring we have a healthy mahinga kai environment, an abundant mahinga kai environment, and one we are all interconnected to so that we can share in its treasures. We have then identified three pou – our guiding principles – that will help us decide how to reach these goals, and then shared some of the stories and histories that make Whakaraupō/Lyttelton Harbour such a special place.

Next we have identified what a healthy, abundant, and interconnected mahinga kai environment will look like in the future, from the high outcrops at the top of the catchment all the way to the middle of the harbour – ki uta, ki tai. Now that we have set our sights on the future we want, we are able to look at what is standing in our way. Four Key Focus Areas are identified – erosion and sedimentation, pollution, terrestrial indigenous biodiversity, and marine indigenous biodiversity – and a suite of priority actions and other actions show how we will restore the ecological and cultural health of Whakaraupō/Lyttelton Harbour as mahinga kai.

This whole plan is the nestled within the metaphor of weaving a korowai, with each step linked to a different step in the process of making a traditional korowai, from harvesting and working the raw materials, to weaving different natural fibres and feathers from throughout the catchment into our korowai, creating the patterns upon it that represent key focus areas for us, and finally wrapping it around our Harbour and maintaining it for generations to come.







# Part I



*Before we can start to weave our korowai we must harvest the materials we will need. Part of harvesting is understanding the history of the materials, the process we are about to embark on, and sharing the experience of harvesting with others. We must also work these raw materials to create the resources we need to start the weaving process. For this plan, this means understanding the history of the catchment and genesis of this plan, and taking the wealth of information received from the community and partners and working this into key strands to weave throughout this plan.*

## Kaupapa/Purpose of Plan – Mahinga Kai

Mahinga kai is a concept that is important to the whole Whakaraupō/Lyttelton Harbour community – although we may all call it different things. Mahinga kai is a term that is used by mana whenua to represent their customary harvesting practices, but it also speaks about things that everyone who calls Whakaraupō/Lyttelton Harbour home do. Spending time in the environment and building an intimate knowledge of the tides, the best walking tracks, the winds, and where different species can be found (including the best fishing spots) is mahinga kai. Teaching your children to thread their first fishhook, how to dig in the sand for pipi, and how to cut flax for arts and crafts is also mahinga kai. At the same time, taking action to preserve these experiences for future generations through only taking what you need, supporting species to breed or regenerate, and being aware of your own impact on the environment is an important part of mahinga kai.

The Lyttelton Port Recovery Plan states that the key objective of this plan is to “restore the ecological and cultural health of Whakaraupō/Lyttelton Harbour as mahinga kai” (LPRP, 5.1). We have taken this directive and chosen it as the key purpose for this plan – to restore Whakaraupō/Lyttelton Harbour so that all those who call the area home can engage in mahinga kai practices, from the mana whenua of Ngāti Wheke, through to the locals living in the harbour and those who visit from elsewhere either for work or leisure, through to the Port and its community of workers.

## Whāinga/Goals

To meet our purpose of restoring the ecological and cultural health of Whakaraupō, three whāinga/goals have been chosen to help articulate what an environment is that supports mahinga kai. It is our desire that in the future mahinga kai in Whakaraupō will be described as abundant, healthy, and interconnected.

### Abundant

In the future there will be an abundance of native species within the Whakaraupō/Lyttelton Harbour catchment. This will be both in terms of the diversity of native species present, and the size of these populations. People of all ages and abilities will be able to go down to the shore and gather shellfish, and fishermen will always come home with enough for their families. Native birdsong will be an everyday sound, and penguins and dolphins will be commonplace in the harbour. Native plants will cover the landscape from giant tōtara, through to harakeke and raupō.

### Healthy

A healthy Whakaraupō/Lyttelton Harbour means that people do not have to think twice about eating kai that they have caught from the harbour or sourced from the land. It means that we can see fish as they swim past the jetties, flocks of fat birds flying across the harbour, and native plants growing lush and green. Our waterways will be planted, thriving ecosystems, and sedimentation and pollution will not be stunting the growth of species.

### Interconnected

The community will continue to be interconnected and engaged with the natural environment in Whakaraupō/Lyttelton Harbour, and locals and visitors of all abilities – from parents with prams, young children, kaumātua, and those with mobility challenges – and able to easily access natural recreation and mahinga kai sites. People are proud of their home (or home away from home) and can be found walking on the beach, swimming in the harbour and streams, and exploring the bush whenever the sun is out. Kayaks, sailboats, waka, and fizz boats will be out on the water almost every day. Locals take pride in their roles as active guardians of the harbour and come together through many grassroots environmental initiatives. They are passionate about the future of Whakaraupō – especially ensuring that future generations can experience what makes this place special.



## Pou/Guiding Principles

Pou were originally placed on the environment to guide people to key locations, and just like traditional pou, these pou will guide decisions that are made in this document. They are the foundations of the agreed way forward for *Whaka-Ora, Healthy Harbour*. These pou were based on conversations held with community groups through engagement workshops, and the work of the Whakaraupō Catchment Management Plan Partners Working Group. The three pou are:

### Change-making

This plan adopts the idea that everyone can be a change-maker with the power to influence the future state of Whakaraupō/Lyttelton Harbour. It is agreed that the status quo is no longer acceptable in Whakaraupō/Lyttelton Harbour and we must set a course for the better future we are envisioning. *Whaka-Ora, Healthy Harbour* aims to guide and support us as change-makers in actions that will have a positive impact on our harbour.

### Mō tātou, ā, mō kā uri ā muri ake nei for us and our children after us

Restoring the harbour and wider catchment is a lofty vision that will take more than one generation. *Whaka-Ora, Healthy Harbour* is the foundation that will set some things in place that will not be completed by those of us working on this kaupapa/purpose today – the job is too big for just one generation. It is accepted that not all projects or actions will immediately spark change, rather some will provide a platform for future gains which will then be taken forward by the next generation of people invested in the future of Whakaraupō/Lyttelton Harbour.

### Collaboration

Working together is important to gaining traction on a kaupapa/purpose such as this. It is impossible for one group alone to change the future of our harbour, therefore we must work together to create real, sustained change. Different groups within our community bring different strengths, from our retired or older community members that can help us understand change over time & be our eyes and ears within the harbour, to people in positions of power who can instigate and run projects, through to our youth who can think outside the box and suggest new, innovative ways to support Whakaraupō/Lyttelton Harbour. By bringing these and other skill sets together we will be in a strong place to reach the goals we are setting in this plan. In developing future actions, preference will be given to actions and ideas that involve or bring together multiple groups to achieve outcomes, as these relationships will be important in the future.

## The Partners

Everyone who feels connected to Whakaraupō/Lyttelton Harbour has an important part to play in protecting and supporting it into the future. This includes the seniors and kaumātua within our communities, our children and their schools and playcentres, mana whenua, our community groups and clubs, local boards and representatives, business owners, landowners, and visitors. Five specific groups within our wider community were tasked with the responsibility of writing *Whaka Ora, Healthy Harbour* (as per the commitment within the Lyttelton Port Recovery Plan). These five key partner organisations are Te Hapū o Ngāti Wheke, Te Rūnanga o Ngāi Tahu, Lyttelton Port Company Limited, Canterbury Regional Council, and Christchurch City Council. They each have a key stake in the harbour for various reasons, and have a responsibility for restoring its ecological and cultural health, alongside the rest of our community.

### Te Hapū o Ngāti Wheke & Te Rūnanga o Ngāi Tahu

Ngāti Wheke are the Ngāi Tahu hapū based in Rāpaki, with deep roots throughout Whakaraupō. They hold mana whenua and mana moana over Whakaraupō which is expressed through place names, tribal histories, and their marae at Rāpaki. Mahinga kai is a vital aspect of Ngāti Wheke's cultural identity and as mana whenua, they have an intergenerational responsibility to act as kaitiaki for our environment. Māori and the natural world share whakapapa, therefore the welfare of the natural world and Ngāti Wheke's own welfare are intertwined.

In 1998 Ngāti Wheke established the first mātaihai reserve in the country, The Rāpaki Mātaihai. It provides certain powers to Te Hapū O Ngāti Wheke for the management of fisheries resources of cultural significance in Rāpaki. A second mātaihai has recently been established across two thirds of the harbour. Ngāti Wheke are also heavily involved in environmental issues through council relationships, Department of Conservation, education providers, and community groups, and are supported by Te Rūnanga o Ngāi Tahu with technical advice in planning, policy, and scientific matters. Ngāti Wheke play an important leadership role in ensuring a sustainable future for the Harbour. They commit to working in good faith alongside others to improve the health of their takiwā based on impacts upon the cultural association with Whakaraupō, preservation of our community resources, and potential economic benefit for our current and future generations within our Lyttelton Harbour community.

## Lyttelton Port Company Limited

Lyttelton Port Company run the South Island's largest Port, situated in the heart of Lyttelton Township – and have done since its humble beginnings in 1849. The Port is the gateway to the world for South Island exporters and importers and the entry point for all the goods that keep our region moving. The Port is a significant piece of strategic infrastructure underpinning important economic drivers of the Canterbury regional economy i.e. agriculture and manufacturing (including agricultural product processing) and playing a role in tourism as well.

Lyttelton Port Company considers the Port to be part of the fabric of the harbour environment and see themselves as having an obligation to make sure the harbour is healthy now and into the future. They invest heavily in science and technical information to ensure they manage their operations and development to support a healthy harbour. Lyttelton Port Company is committed to continuous improvement in their environmental management and partnering to get great outcomes as they develop the Port's world-class services to ensure they provide the facilities and worldwide connections that keep our Port, our city and our region thriving.

## Canterbury Regional Council (Environment Canterbury)

Environment Canterbury is the regional council for the Canterbury region and has a statutory responsibility to manage the cumulative environmental effects of activities within Whakaraupō/Lyttelton Harbour. Environment Canterbury also works with communities, mana whenua, businesses, industry sectors and groups on the management of natural resources – air, coasts, water, land and biodiversity - to achieve environmental and economic development outcomes.

Environment Canterbury monitors the state of the environment in Whakaraupō/Lyttelton Harbour, including freshwater flows and quality and coastal water quality, and issuing and monitoring resource consents against the framework set out in its land, water, and coastal regional plans and the Lyttelton Port Recovery Plan. Environment Canterbury is committed to adopting a collaborative 'ki uta ki tai' approach to these statutory functions in Whakaraupō, and to using *Whaka-Ora, Healthy Harbour* to guide investment in scientific monitoring and investigations within Whakaraupō, and to report results to the community. Environment Canterbury will continue to seek opportunities to work collaboratively for shared outcomes for Whakaraupō/Lyttelton Harbour by supporting practical projects, including direct funding for biodiversity projects through the Canterbury Water Management Strategy, and providing advice on environmental risk management through tools such as farm environment plans and the builders pocket guide.

## Christchurch City Council

Christchurch City Council is the district council for Christchurch, including Banks Peninsula and has a responsibility to manage the effects of activities and development on land within Whakaraupō/Lyttelton Harbour through the Christchurch District Plan. Christchurch City Council provide and maintain infrastructure, including public roads, water, wastewater and stormwater along with parks, reserves, jetty, and community facilities. This is done alongside communities, mana whenua, business sectors and conservation groups. They also provide funding for biodiversity improvements and community groups.

In providing infrastructure, Christchurch City Council must ensure that it meets all relevant resource management rules at the district and regional level. This applies to things such as stormwater discharges which need consent from Environment Canterbury. Christchurch City Council commit to ensuring that any effects of infrastructure, including discharges, are minimised and will not contribute to the degradation of the harbour and surrounds. They also commit to adopting a ki uta ki tai approach to planning and managing the effects of infrastructure, to working collaboratively to achieve the shared outcomes of *Whaka-Ora, Healthy Harbour*.



# The Whakaraupō/Lyttelton Catchment

## Early History of Whakaraupō Lyttelton Harbour

The South Island of New Zealand is seen by Ngāti Wheke as Te Waka o Aoraki. Whakaraupō - and the wider Banks Peninsula - was created as Tūterakiwhānoa (Aoraki's relation who came in search of him and his brothers) raked rubble from their crashed waka into a heap to clear what is now the Canterbury Plains. Generations later the harbour was given its name of Whakaraupō - the reed-filled harbour - by the great explorer Tamatea-Pōkai-Whenua. He also gave his name to the prominent peak Te Poho o Tamatea (the peak overlooking Rāpaki Bay) which is the ancestral mountain of this area.

Whakaraupō was first settled by Waitaha and Ngāti Māmoe, with Ngāi Tahu assuming mana whenua of the area in the 18th century through both conquest and intermarriage. Ngāi Tahu asserted their mana whenua status through the actions of the chief Te Rakiwhakaputa who threw his rāpaki (waistmat) upon the beach which is now known as Te Rāpaki o Te Rakiwhakaputa - or Rāpaki for short. Te Rakiwhakaputa's son, Wheke, remained at Rāpaki and his descendants are now known as Ngāti Wheke.

Ngāti Wheke developed a culture based around mahinga kai - interactions with the natural environment to provide for and sustain their people. Whakaraupō and its catchment were teeming with mahinga kai species such as pioke (dogfish), kererū, and shellfish which Ngāti Wheke took great pride in protecting and fostering. This ensured that they upheld their mana and responsibilities as kaitiaki so that mahinga kai species were always healthy and abundant so as to feed both their families and visitors.

In the 1840's the first Pākehā settlers arrived in Whakaraupō/Lyttelton Harbour and began to lease land for farms. In 1849 the Port Cooper Deed was signed and Pākehā settlement expanded throughout the harbour, resulting in Ngāti Wheke - who originally had settlements throughout the harbour, particularly at Purau - being pressured to consolidate at the Native Reserve at Rāpaki due to land sales and other pressures from settlers.

In 1850 the Canterbury Associations First Four Ships landed in what is now Lyttelton, with their passengers climbing up the Bridle Path over the Port Hills to establish the settlement of Christchurch. Lyttelton Port was established in 1877 through the establishment of the Lyttelton Harbour Board, and has become a defining feature of the harbour; growing with Canterbury to become what is now the third largest port in New Zealand. Generations of locals have worked at the Port, and its industrial aesthetic and hum of activity have become an intrinsic part of Lyttelton's identity.

## Harbour Communities

The communities of Whakaraupō/Lyttelton Harbour are engaged and active, and many are drawn to the area for its natural environment. Locals have been this way for generations which can be seen in the areas rich history, including links to Antarctic exploration endeavours, and development of new nautical crafts such as the now iconic Optimist class one-man yacht. Rāpaki is also the location of New Zealand's first mātaītai (customary fishing reserve). This was established in 1998, and allows Tangata Tiaki - Crown appointed customary fishing officers - to use bylaws to manage customary food gathering as a way to protect and foster mahinga kai species within Rāpaki.

Many locals - and visitors - pride themselves on their ability to engage with the harbour through fishing, sailing and paddling, swimming, and walking the various tracks. Many are also involved with maintaining and restoring areas of the harbour that have become degraded over time, due to the responsibility they feel to ensure that Whakaraupō/Lyttelton Harbour is protected and maintained for them, and the generations after them. Along with the mātaītai, community groups are busy with activities such as planting days to help protect and restore local streams and habitats, beach clean ups, and education initiatives, as well as establishing a variety of environmental trusts, groups, and actively participating in zone and reserve committees, and community boards and workshops.

## Genesis of this Plan

In 2010 and 2011 Whakaraupō/Lyttelton Harbour communities were struck hard by the Canterbury Earthquake Sequence. Lyttelton Port was severely damaged. To expedite recovery the Lyttelton Port Recovery Plan began to be drafted. In November 2015, the Lyttelton Port Recovery Plan came into effect. One of the commitments that came out of this plan was to create the Whakaraupō/Lyttelton Harbour Catchment Management Plan. The Catchment Management Plan was aimed at restoring the ecological and cultural health of the harbour as mahinga kai, and was to be developed in accordance with the philosophy of ki uta ki tai.

Te Hapū o Ngāti Wheke, Te Rūnanga o Ngāi Tahu with Tangata Tiaki, Canterbury Regional Council, Christchurch City Council and Lyttelton Port Company Limited have worked together alongside the local community to develop this catchment management plan.

# Part II

*Now that all of our materials have been harvested we can begin weaving our korowai. Into this korowai we weave the Whakaraupō/Lyttelton Harbour catchment from the high outcrops, through to the streams that run through the different bands of vegetation, out to the harbour itself. This korowai can only be created if all of the harbour, ki uta ki tai, is thriving and providing an environment for the species in each ecological band to grow. If one band is unhealthy, the whole catchment is unhealthy and there will be a hole in our korowai - meaning that we are not succeeding in keeping our catchment protected and cared for.*

This section of the plan focuses our thoughts on the future. Here, we will describe how we want the six ecological bands that span the catchment, ki uta ki tai, to be in a future where Whakaraupō/Lyttelton Harbour is a place that provides healthy, abundant, and interconnected mahinga kai opportunities. These bands are high outcrops and forests, hills and lowlands, streams, wetlands and saltmarsh, taihua/foreshore and harbour. Refer to the map on page xx.

We will talk about the abundance of plants and animals that we want to see in each ecological band, including birds, fish, and reptiles – some of which we highlight as 'touchstone species'. These are species that we especially want to see thriving in Whakaraupō/Lyttelton Harbour. We describe the health of these species and the way we would like to see them reassert themselves within the harbour, and also highlight the way that people are interacting and being integral parts of the harbour through their engagement and impact on the landscape.

We then take a step back to the present day and take an honest look at what each ecological band looks like now. This includes our current land uses and practices and how they are impacting on our environment, as well as the health and abundance of different species important to us ecologically, culturally, and as a community. By comparing where we want to be in the future with where we are now, we are able to see any gaps, and can start to identify what roadblocks are stopping us from closing those gaps. We can use this information to choose actions to undertake in each ecological band (or across multiple bands) to remove those roadblocks and enable us to reach the future we are aspiring for within our harbour.

## High outcrops and Forests



From the high outcrops and forests we source the feathers of the kāhu (harrier hawk). The kāhu is our kaitiaki for the highest bluffs and summits of the Port Hills, and high slopes, summits and gully heads of Te Ahu Pātiki/Mt Herbert area.

The kāhu shares this area with a number of important species. These include the pipit, copper butterfly, pōhuehue (muhlenbeckia), thin-barked tōtara, kārearea (falcon), Canterbury tree weta, prostrate kowhai and native tussocks, which are key touchstone species for us in this area.

### Future state

When the kāhu soars over the high outcrops we want it to see native tussocks, taramea (golden spaniard) and mountain flax prevailing over introduced grasses and weeds in these cooler, and more exposed areas, whilst tōi (mountain cabbage tree) are abundant in the sheltered cool wet forest on Te Ahu Pātiki/Mt Herbert.

As it flies across the upper valleys, gullies and ridges our kāhu will be able to perch among the thin barked tōtara which will dominate this area, along with horopito (pepperwood), mountain five finger and native holly. These upper bush gullies will have many small patches of different activities such as pasture, sustainably managed plantation forest and tussock landscapes, interweaving with native forest and linking the high ridges and valley heads with the rest of the Harbour environment.



Thriving populations of pipit, kārearea (NZ falcon), will join our kāhu in the rocky tussock and shrub land of the crater rim, and fly above the boulder-dominated ridges and outcrops. These species will be supported not just by the increased vegetation, but by predator control measures as well. Rare herbs such as myosotis have expanded in numbers and range and take over from the invasive weeds that used to dominate. High forest connections across the crater rim consisting of pōhuehue (muhlenbeckia), prostrate kōwhai and porcupine bush support geckos, skinks, copper butterflies and many other insects including the Canterbury tree weta. They also provide improved bird and invertebrate corridors and food resources between the harbour basin and the surrounding catchments.

Dense native forests now sit below the high outcrops and provide contrast to the plantation forests. An abundance of native climbers, shrubs and herbs can also be found in the high outcrops, which help stabilise steep slopes, rock faces, cliffs, and boulder fields, making them more resilient in the face of natural disasters. This also helps safeguard the Crater Rim Walkway which continues to be a popular recreation and tourism activity that links Te Ahu Pātiki/ Mt Herbert, the Summit Walkway/Te Ara Pātaka, The Monument, Charteris Bay and Diamond Harbour and provides stunning views across the harbour, Port and outer northern bays – similar to the views our kāhu sees as it flies over these high outcrops and forests.

### Current state

Today, this kāhu sees large tracts of exotic species – particularly grasses – populating the high outcrops. Whilst there are some native plants that are starting to take hold (particularly in the south facing rocky gullies along the upper Port Hills) and providing homes for small populations of native species, weeds such as gorse, broom, and bone seed are more commonplace. This means that there aren't as many places for our native birds, reptiles, and insects to call home. They are therefore limited to small patches of native bush occupying gaps between the outcrops and boulder fields. Many of our rock faces are bare, meaning that they can pose a higher rock fall risk to the walking tracks which are extremely popular with our harbour community, and visitors from Christchurch and further afar.

Below the high outcrops most of the land is currently in pasture and plantation forestry. Areas not in pasture or forestry are covered in shrub weeds such as gorse, turning the once green hill faces yellow. There are small areas of regenerating native vegetation which are providing homes for small native and introduced bird populations – although these patches are isolated from each other in many cases, which restricts these populations from growing. Our kāhu does not have many places to call home. The lack of plant cover also means that erosion is an issue, as well as waterway pollution due to the lack of riparian planting in many areas, some forestry practices, and stock having free access to many streams. In some places, houses have started to be built in this band, increasing human footprints on the landscape and detracting from its natural look, as well as contributing to erosion issues through the increased hardstand they introduce to the high forest area.

### Action needed

The main gaps between what we want for this area, and what we currently have is a lack of indigenous terrestrial biodiversity and issues with pollution, particularly soil loss. To achieve our future aspirations for the high outcrops and forests ecological band, *Whaka-Ora, Healthy Harbour* will focus on developing a programme to target erosion and sedimentation, identifying and managing key pollution sources and contaminants, developing a landscape scale biodiversity plan to guide habitat protection, restoration, planting and pest and weed management priorities, support community planting initiatives, and support the preparation of a mahinga kai habitat map.

Specific actions that will be implemented that will affect this band include:

- Key Focus Area - Erosion and sedimentation: Actions 4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11
- Key Focus Area – Pollution: Actions 2.5, 2.7.
- Key Focus Area – Terrestrial indigenous biodiversity: Actions 3.2, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.13.
- Research and Monitoring – 5.7, 5.11, 5.12, 5.13, 5.15, 5.16.

## Hills and Lowlands



The hills and lowlands are home to the kererū which will also add its feathers to our korowai. The kererū is our kaitiaki for the area between the foreshore, and the high outcrops and forest. The hills and lowlands are intersected by many streams, both permanent and ephemeral, and are also where many of the people that call Whakaraupō/Lyttelton Harbour home live. The majority of the homes, roads, and commercial areas are concentrated around Governors Bay, Teddington, Charteris Bay to Diamond Harbour, and Purau Roads. Lyttelton Port can also be found within this ecological band, along with the main commercial hub of Lyttelton township.

The kererū shares this area with both residents, and a number of important species. These include the tōtara, mānuka and kānuka, kāhu, jewelled gecko, rūrū (morepork), whauwhaupaki (five finger), and the red admiral butterfly, which are key touchstone species for us in this area.

### Future state

Our kererū will be able to perch among large lowland tōtara and mataī forests which will dominate upper areas not needed or desirable for agricultural production (especially on fertile, steep, erodible slopes, and along gullies and streams). Large (over 5ha) patches of mataī, lowland tōtara and kahikatea forest will create a network linking lowland agriculture, plantation forestry, park lands, and lifestyle-blocks. This extensive network will support not just our kererū, but also the korimako (bellbird), kāhu, miromiro (tomtit), pīpihi (brown creeper), rūrū (morepork) and tūi to grow to abundant numbers, as they are able to move freely throughout the catchment via these networks of vegetation. These mid and lower forests are large enough to provide food all year round, and provide refuges for our kererū and other species during winter cold periods. Tōtara, houhere (narrow leaved lacebark), kōwhai, whauwhaupaki (five finger), and mānuka and kānuka enrich agricultural landscapes, providing a safe home for the jewelled gecko, and ongaonga (tree nettle) on forest margins support red admiral butterflies.

As our kererū flies across to the inner harbour headlands he will see coastal forest species such as akeake, ngaio, native passion vine, and leafless clematis - especially on the more shaded Lyttelton side. With better predator control kororā (white flippered penguins) extend their range and numbers utilising coastal slopes for nesting sites, and sea birds such as tītī (sooty shearwater) return to coastal headlands to breed. Vulnerable locations are also permanently stabilised with appropriate plantings.

As well as an abundance of birdlife, our kererū will see thriving communities of people living within the carrying capacity of the harbour. Locals are aware of their impact on the environment and actively look for ways to reduce their footprint; including through best practice stormwater management, erosion & sediment controls, and pest and weed control. Sediment washing across the road after wet weather is no longer a common site. Residential areas support native birds and insects so that birds such as our kererū will be able to fly between native planting in backyards, public open spaces, and vegetated riparian margins easily, making them a common site in Whakaraupō/Lyttelton Harbour.

Infrastructure, waterway margins, forestry and subdivisions are well maintained and continually adapted to make sure that all steps are taken to reduce pollutants entering our harbour. Businesses also put thought into their operation and development so that native wildlife habitats are retained and enhanced where possible. This includes the Port, which will realise its growth potential while setting the standard nationally through its environmental management and community partnerships

Communities are strong and interconnected – with each other, and the easily accessible shoreline and native bush - so that they can easily engage with the things that make this harbour unique. Existing public open space is linked with recreation routes and new park / habitat areas are developed in strategic locations around the harbour basin. Walkway and cycle connections to mid elevation areas and the crater rim are developed and improved. In particular, the Head to Head Walkway connects the harbour communities, providing improved resident and visitor experience of beaches, bays, and headlands for mahinga kai activities such as fishing, shellfish collecting, and other marine recreation pursuits, all whilst ensuring high tide roosting areas for foreshore, nesting birds, and other species are protected. Residents and visitors see themselves as part of the environment and are almost outnumbered by the different birds, reptiles, and insects that live alongside them in the native bush - an ideal home for these species like our kererū due to the lack of predators.



## Current state

Our korerū currently lives within an ecological band experiencing many different pressures. Agricultural, rural, lifestyle, and urban living environments dominate. Because of this, the korerū is sharing its home with the majority of the people who live within Whakaraupō/Lyttelton Harbour. As our korerū flies, it sees large areas of active and historic erosion within this band - especially at the head of the harbour. Erosion along waterways, road margins, tracks, quarry sites, forestry and subdivisions potentially contribute to harbour siltation. Erosion from road cuttings is particularly noticeable, with sediment running across the roads after wet weather. Areas of native vegetation cover are largely restricted to outcrops, steep rocky slopes, gullies, and parks. Small refuges of coastal shrub land including pōhuehue (*muhlenbeckia*), matagouri, prostrate kōwhai, cabbage trees, and small leaved coprosmas still occupy these areas and headlands around the inner harbour. These provide some habitat for our korerū and other species such as the miromiro (tomtit), tūi, and jewelled gecko.

The built environment has areas of hardstand (roads, roofs, paths and other impervious areas) in which increase stormwater run-off. This stormwater contains pollutants including sediment, heavy metals and nutrients. Steep cuttings for roads are often poorly managed, resulting in erosion and sediment run-off to streams and the coastal environment.

The human presence in this area has also attracted many predators such as rats and cats which make it difficult for our native species to thrive. The coastal margins of some residential areas are also heavily infested with potentially invasive weed species. Communities are taking positive steps to improve the quality of their environment, including planting native species in their gardens, managing run-off from their properties and controlling predators. The Port is also being rebuilt with modern infrastructure capable of capturing and treating pollutants and minimising effects on the environment, but although this conversion is underway, it will take around a decade before the full port area is upgraded to these standards.

Although many of the residents are attracted to Whakaraupō/Lyttelton Harbour for its harbour environment, recreation access to the coastline and upper areas of the harbour is limited, and parks around the harbour and through the flatter areas are irregularly located and disconnected. Apart from Orton Bradley Park, recreation opportunity is largely limited to a few high elevation areas on the south-eastern side of the harbour and the upper Port Hills. This gives people limited places to enjoy Whakaraupō/Lyttelton Harbour – a problem shared by our korerū in this band.

## Action needed

The main gaps between what we want for this area, and what we currently have are related to waterway pollution and sedimentation, issues with erosion, and a lack of indigenous terrestrial biodiversity. To achieve our future aspirations for the hills and lowlands ecological band, *Whaka-Ora, Healthy Harbour* will focus on developing a programme to target erosion and sedimentation which will include best management practices for a range of land use and activity types, identifying and managing key pollution sources and contaminants, developing a programme to target erosion and sedimentation, identifying and managing key pollution sources and contaminants, developing a landscape scale biodiversity plan to guide habitat protection, restoration, planting and pest and weed management priorities, supporting community planting initiatives, supporting the preparation of a mahinga kai habitat map, and considering how regional and district planning processes can better support the goals of *Whaka-Ora, Healthy Harbour*.

To specifically address the issues the built environment cause, *Whaka-Ora, Healthy Harbour* will also focus on understanding the contribution of pollutants - especially sediment - from the built environment into streams and the harbour, develop a stormwater management plan for settlements and public land, continue to implement stormwater and wastewater infrastructure upgrades, promote pollution control practices, develop a landscape scale biodiversity plan to guide restoration and planting in the built environment, and encourage and support community led planting initiatives.

Specific actions that will be implemented that will affect this band include:

- Key Focus Area - Erosion and sedimentation: Actions 1.1, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8.
- Key Focus Area - Pollution: Actions 2.1, 2.2, 2.5, 2.6, 2.7, 2.8.
- Key Focus Area - Terrestrial indigenous biodiversity: Actions 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.11, 3.13.
- Research and Monitoring; Actions: 5.6, 5.11, 5.12, 5.13, 5.15 and 5.16.

## Streams



Pukeko are found along the streams and provide us with their iconic blue feathers. The pukeko is our kaitiaki for the many permanent and ephemeral streams that weave throughout Whakaraupō/Lyttelton Harbour from the crater rim and the peaks to the harbour – ki uta, ki tai. There are five permanent flowing streams that enter the harbour: Purau, Te Wharau, Waiake, Te Rapu (Teddington) and Living Springs (Allandale), and numerous other small streams that flow during the wetter months but are dry over summer (ephemeral).

The pukeko shares this area with a number of important species. These include the tuna (eel), caddisfly, stonefly, mayfly, pūhā (watercress), kōkopu (cockabully), kōura (freshwater crayfish), kākahi (freshwater mussel) and kanakana (lamprey), which are key touchstone species for us in this area.

### Future state

We will see the pukeko's blue feathers weaving in and out of the planted stream edges and riparian vegetation. This planting shades the water, provides habitat, filters nutrients, and provide support to the stream banks. The banks will be stable which helps create stream beds that are predominantly stony in nature and not smothered in sediment. These clean, clear waters provide a great environment for tuna (eel) who fill these rivers, along with healthy populations of sensitive native species such as kōura (freshwater crayfish), kōkopu (cockabulies) and kanakana (lamprey).

The pukeko shares this area with abundant kōtare (kingfisher) populations which are attracted by the healthy stocks of fish such as kōkopu (giant bully), and kākahi (freshwater mussel). Insects such as caddisfly, stonefly and mayflies are also present; drawn to the streams high water quality. Our pukeko will also be used to the sounds of mana whenua and other locals laughing as they swim and play in the streams, whilst further along families engage in mahinga kai practices to harvest pūhā (watercress), and tuna (eel).

Along with the pukeko, our community no-longer need to be worried about the health of the food they eat from these streams as they know that stock haven't been in the water, due to effective riparian fencing and development of suitable stockwater schemes in the agricultural areas of the Harbour.

### Current state

The pukeko currently sees many different things as it traverses the permanent and ephemeral streams of Whakaraupō/Lyttelton Harbour. Despite often being unprotected and unfenced, our pukeko experiences headwater springs and upper stream reaches that are mostly healthy and clean. Monitoring undertaken in the higher reaches of the catchment show a good result which tells us that if sediment and contamination can be controlled there is potential for the areas streams to support a diverse and healthy aquatic ecosystem all along their length.

However, as the streams get closer to the harbour they start to deteriorate. Monitoring shows high levels of sedimentation and phosphorus, at times high E. coli, and nitrogen being present in these waters. Many of the streams within farmland are unplanted and unfenced, meaning that stock often are able to enter them. This increases erosion of their banks and causes pollution from animal effluent entering the water. As the streams enter the more urban areas polluted run-off from roads and roofs becomes an issue, as well as pollution from poorly maintained septic tanks, and stormwater run-off. This affects the quality of our waterways, which in turn has a direct impact on the health of species that depend on a fully functioning ecosystem, such as pukeko, inanga and tuna.





Fortunately, the natural form of the streams in Whakaraupō/Lyttelton Harbour makes them resistant to many exotic fish species such as trout. This means that there is less predator pressure from exotic fish species impacting the abundance of our native species such as tuna (eel) and kākahi (freshwater mussel). Community groups, mana whenua, and councils have been working hard to improve water quality by establishing riparian planting and fencing on public land, and landowners have been working to do the same on private land. Despite this, the effects of the pollution and sedimentation on the streams within Whakaraupō/Lyttelton Harbour can still be seen through poor water quality and sediment covering the river beds reducing habitat quality, which restrict the abundance of aquatic life in them such as kōura (freshwater crayfish), kōkopu (cockabullies) and kanakana (lamprey), insects such as caddisfly, stonefly and mayflies, and birdlife such as our pūkeko and the kōtare (kingfisher).

This also affects the ability of mana whenua and other locals to gather food such as pūhā (watercress), whitebait (inanga), and fish from these streams for their families, as well as making them unhealthy to swim and play in. Te Hapū o Ngāti Wheke and the wider community have indicated concern over the state of the areas permanent and ephemeral streams. There is a general concern that the state of our streams is declining and maintaining the status quo is not acceptable.

### Action needed

The main gaps between what we want for this area, and what we currently have relate to waterway pollution and sedimentation, issues with erosion, and a lack of indigenous terrestrial biodiversity. To achieve our future aspirations for the streams in this ecological band, *Whaka-Ora, Healthy Harbour* will focus on waterway pollution (with the main pollutant being sediment), issues with bank erosion, and stock access. Specific actions that will be implemented in this ecological band will initially focus on the five permanently flowing streams and will build on the considerable riparian fencing and planting that has already occurred thanks to engaged community groups, landowners and their efforts.

The long term objective of the work on these streams is to enhance riparian margins and water quality to a state where sensitive species such as kōura (freshwater crayfish), kākahi (freshwater mussels) and kanakana (Lamprey) are again present and that the whitebait fishery is significantly enhanced. In addition to a focus on the five permanent streams there will also focus be a on ensuring that activities that effects streams are suitably controlled, appropriate signage is in place to ensure road crossing over named streams include both Te Reo and English language, and the development of an education programme to inform the community about streams in our catchment and to encourage increased interaction. In the longer term, the focus will shift from the permanent in flowing streams to the ephemeral ones.

Specific actions that will be implemented in this band include:

- Key Focus Area - Erosion and sedimentation: Actions 1.1, 1.6, 1.8, 1.11.
- Key Focus Area – Pollution: Actions 2.4, 2.5, 2.7, 2.9.
- Key Focus Area – Terrestrial indigenous biodiversity: Actions 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.11, 3.13, 3.14.
- Research and Monitoring – Actions: 5.7, 5.9, 5.10, 5.11, 5.12, 5.14, 5.16.and 5.17.





## Wetlands and Saltmarsh



From the wetlands and saltmarshes we source the fibres of the raupō – the reeds that give Whakaraupō its name. Raupō are our kaitiaki for the low-lying areas around the Head of the Bay / Teddington area, and grow alongside a number of important species. These include the pūkeko, inanga (whitebait), harakeke (flax), kahikatea and seagrass, which are key touchstone species for us in this area.

### Future state

In the future, raupō will grow thick within the extensive, re-established wetlands and saltmarsh on the flatter areas near the coastline - especially around the Head of the Bay / Teddington. It will grow alongside harakeke (flax) bushes which will be well used by local weavers and artists, who will engage in mahinga kai practices to harvest these fibres.

A labyrinth of watercourses wind their way through extensive and healthy stands of our raupō and harakeke, with kahikatea trees on the higher islands. Closer to the shore the wetlands transition into saltmarsh. These make perfect homes for pūkeko who can be found among the vegetation. The winding, slow moving nature of these watercourses help trap sediment; preventing it discharging into the harbour. The wetland provides habitat for inanga (whitebait) to spawn and for juvenile pātiki (flounder) to grow. Our raupō grows amongst a thriving ecosystem with an abundance of insect, bird, aquatic and plant life. It - along with seagrass - dominates the saltmarsh area, providing homes and feeding grounds for crustaceans, molluscs, bird, and fish species such as tuaki (cockles), tōrea (oystercatcher), mud crab and karoro (seagull).

Along with providing this habitat, our raupō - now well established back in the head of the harbour - is culturally significant as it reminds us of the meaning of Whakaraupō: the harbour of reeds (a site that had not been seen for many years until now). While the low lying nature of the area makes it susceptible to the effects of sea level rise and climate change, a healthy functioning wetland and saltmarsh system will help buffer those effects. As sea level retreat occurs, the wetland and saltmarsh areas will naturally move further inland, and our raupō will continue to thrive.

### Current state

Our kaitiaki, raupō, has not yet re-established its presence in the harbour. The very few reeds that are there see straight drainage ditches, little remaining wetland, and very limited harakeke. It also sees reclamations, extensive areas of predominately exotic plant species, and in some cases stock grazing close to the shoreline. Erosion of the surrounding hills leads to high sedimentation rates with the intertidal mudflat area (measured from the shoreline to the level of average low tide) at the Head of the Bay increasing from 700 meters before 1900 to 2,000 meters in 2007.



The head of the harbour includes the saltmarsh and mudflats which have been affected by reclamation and the invasion of exotic plant species. The freshwater wetlands where our raupō likes to grow are rare, with shallow muddy bays much more common as a result of sedimentation in the harbour. Along with a lack of raupō, there is very limited abundance of sea grass as they are smothered by sediment. The lack of sea grasses means that species, including gastropod molluscs and crustaceans that depend on them for food and shelter are also lacking in abundance.

### Action needed

The main gaps between what we want for this area, and what we currently have relate to sedimentation, and a lack of indigenous terrestrial and marine biodiversity. To achieve our future aspirations for the wetlands and saltmarsh ecological band, *Whaka-Ora, Healthy Harbour* will focus on re-establishing the natural drainage paths and the coastal wetlands and enhancement of the saltmarsh at the head of the bay and Teddington, developing a programme to target erosion and sedimentation, identifying and managing key pollution sources and contaminants, including developing and implementing an integrated freshwater and marine water quality monitoring programme, developing a landscape scale biodiversity plan to guide habitat protection, restoration, planting and pest and weed management priorities, supporting community planting initiatives, supporting the preparation of a mahinga kai habitat map, and considering how regional and district planning processes can better support the goals of *Whaka-Ora, Healthy Harbour*.

Specific actions that will be implemented that will affect this band include:

- Key Focus Area - Erosion and sedimentation: Actions 1.6, 1.8, 1.11.
- Key Focus Area - Pollution: Actions 2.5, 2.7, 2.8.
- Key Focus Area - Terrestrial indigenous biodiversity: Actions 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.13.
- Key Focus Area - Marine indigenous biodiversity: Action 4.5.
- Research and Monitoring: Actions: - Actions: 5.1, 5.3, 5.4, 5.5, 5.7 and 5.18.





## Taihua/Foreshore



Shellfish such as the pāua are found in the taihua/foreshore ecological band, and add their beautiful colours to our korowai. Pāua are our kaitiaki for the area between the high and low tide mark around the harbour coastline (sometimes referred to as the intertidal zone). This band includes sandy and rocky beach areas, as well as parts of the Port infrastructure.

Pāua share this area with a number of important species. These include the pipi, kūaka (godwit), tōrea (pied oystercatcher) and tōrea tai (black oystercatcher), tuaki (cockle), and kūtai (green, blue and black mussel) which are key touchstone species for us this area.

### Future state

This ecological band will be a bountiful food basket of Whakaraupō/Lyttelton Harbour. Pāua will grow large and abundant, with pipi, and kūtai (mussels) growing further up the beach. These species continue to be well monitored and managed by Tangata Tiaki to ensure there is enough for everyone in the harbour to gather and share with their families.

Both people and animals flock to the taihua/foreshore as they know it is healthy, with the presence of pollutants being minimal. Beaches are frequented by visitors and locals enjoying walks, family days out, and mahinga kai activities. Birds such as tōrea, tōrea tai, and kororā (white flipper penguin) are abundant. Our children paddle in the waters, and kūaka (godwit) feed on the many polychaetes and crustaceans.

People who have developed parts of the taihua/foreshore for community spaces or industrial spaces (such as the Port) have actively incorporated habitats for intertidal species such as our pāua, as well as mussels and kūtai in their designs so that they can work with and around these species, and support healthy ecosystems and habitat.

### Current state

Pāua currently sit within a taihua/foreshore that is battling some constraints. Pollution, particularly sediment from higher up in the catchment, as well as some development within this ecological band makes it more difficult for shellfish to thrive. There is limited knowledge about the distribution & abundance of species that are present here, their habitats and the effects of pollutants - particularly sediment - on ecosystem health and species abundance. Tangata Tiaki are actively engaged in monitoring and reseeded projects to support and enhance these species, as well as ensuring shellfish are gathered in sustainable numbers. Despite some pollution issues, the beaches within the harbour are still popular with locals and visitors spending time walking, sunbathing, and playing at the beach on fine days.





## Action needed

The main gaps between what we want for this area, and what we currently have relate to water pollution and sedimentation. To achieve our future aspirations for the taihua/foreshore ecological band, *Whaka-Ora, Healthy Harbour* will focus on developing a programme to target erosion and sedimentation, identifying and managing key pollution sources and contaminants, including developing and implementing an integrated freshwater and marine water quality monitoring programme; completion of a state of the takiwā report that brings together all existing marine species and habitat monitoring information, including development of a prioritised list of research projects in the taihua/foreshore ecological band; developing a research programme focused on harbour hydrodynamics and sediment transport, and considering how regional and district planning processes can better support the goals of *Whaka-Ora, Healthy Harbour*.

Specific actions that will be implemented that will affect this band include:

- Key Focus Area - Erosion and sedimentation: Actions 1.6, 1.8, 1.11.
- Key Focus Area – Pollution: Actions 2.5, 2.7.
- Key Focus Area – Terrestrial indigenous biodiversity: Actions 3.2, 3.4, 3.5, 3.7, 3.8, 3.9, 3.10, 3.13.
- Key Focus Area – Marine indigenous biodiversity: Action 4.5.
- Research and Monitoring: Actions 5.1, 5.2, 5.3, 5.4,, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 5.15, 5.17 and 5.18





The feathers of the tītī round out our ki uta ki tai korowai. The tītī is our kaitiaki for the area beyond the low tide mark from the head of the bays to the entrance to the harbour, and includes the operational area of Lyttelton Port.

The tītī shares this area with a number of important species. These include the hectors dolphin, kororā (penguin), whairepo (stingray), pioke (rig), seaweed/kelp, and karoro (black backed gull), which are key touchstone species for us in this area.

### Future state

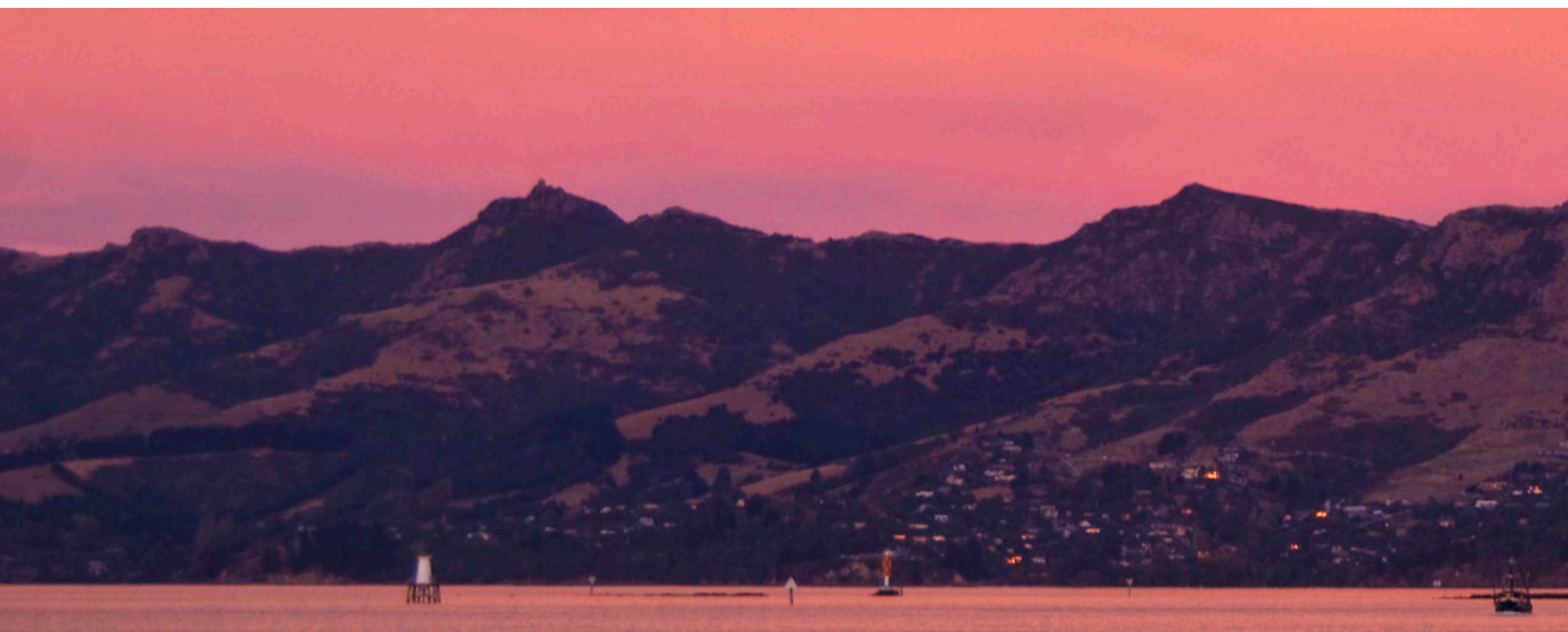
We want our tītī to become a local in Whakaraupō/Lyttelton Harbour. We want it to be as common as hectors dolphins, kororā (penguins), and whairepo (stingray), and the sailors, kayakers, recreational fishermen and ships who use the harbour waters. Fish and other kaimoana such as kina will also be present in abundance, feeding on the many different phytoplankton, and living in the seaweeds and sea grass. They are able to flourish as the waters are healthy and free from high levels of pollutants. The mātaitai are thriving, with traditional knowledge and techniques celebrated by the whole community for their effect in supporting native species to grow and re-establish themselves in the harbour.

Otamahua/Quail Island stands proud in the harbour and is covered by lush vegetation, providing a perching place for our tītī and the other harbour species. The benefits of the 20-year eco-restoration of Otamahua Quail Island are evident in a thriving island ecosystem, showcasing the benefits of a community Trust working alongside the Department of Conservation and Ngāti Wheke.

The tītī – along with the karoro (seagull) weave between the iconic cranes at Lyttelton Port. The Port is a thriving, world class facility contributing to the harbour community's environmental knowledge and supporting the economic and social prosperity of the region. Many local people have a strong connection with the Port, either through work or its value as an interesting, ever changing feature of the harbour landscape.

Lyttelton Port will have adjusted to doubling of container volumes and bigger vessels through deepening the shipping channel providing ships with safe access the space needed to handle the cargoes. Port facilities will have moved east enabling the opening up of the inner harbour for public access again. It will be a modern thriving port that's well connected to its community and supports a healthy harbour environment for future generations.

The tītī still sees sedimentation occurring, but this is happening at a much slower, natural rate, and is much closer to a balance with the tides moving sediment out of the harbour. Sediment coming from the hills has reduced significantly due to people committing to best practice erosion management, and a significant increase in vegetation. This is also contributing to the abundance of life in the harbour as the water is much less turbid, allowing more light to filter through to help seaweeds grow, which provide food and habitat for many other marine species such as pioke (rig).





## Current state

When tīti visit Whakaraupō/Lyttelton Harbour they find a harbour in a state of change. Our upper harbour is filling with sediment. Whilst some of this is natural and part of its lifecycle, the in-filling of the upper harbour is happening faster than it should be due to enhanced erosion on the hills and a lack of stabilising vegetation. Dredging activity also occurs within the harbour for the Port activities, which also changes the natural state of the harbour.

As the tīti flies, it notices that some of the rocky reefs - mainly in the upper harbour - are not as full of life as they used to be. Currently the harbour supports more than twenty four known fish species, eight marine mammals and a diversity of rocky reef, intertidal and bottom dwelling species. However, sediment is covering some of the upper harbour shallow rocky reef areas and making the water more turbid, especially after rainfall or storms, which make it difficult for important species such as seaweed, sea grasses and filter feeders like shellfish to grow. This means that bigger species such as pīoke (rig), whairepo (stingray), and hectors dolphins don't have as much habitat and food. In some places, pollution is also affecting the water quality. This creates more issues for Tangata Tiaki, who are working to support mahinga kai species to grow in the mātaihai. Despite these issues, the people of Whakaraupō are still active within the harbour with fishing and sailing boats, kayakers, waka ama, and other recreationalists making the most of their harbour location.

## Action needed

The main gaps between what we want for this area, and what we currently have, relate to water pollution and sedimentation, and marine biodiversity. To achieve our future aspirations for the harbour ecological band, *Whaka-Ora, Healthy Harbour* will focus on developing and implementing an integrated freshwater and marine water quality monitoring programme, complete of a State of the Takiwā report that brings together all existing marine species and habitat monitoring information, including development of a prioritised list of research projects in the harbour ecological band; develop a research programme focused on harbour hydrodynamics and sediment transport, identify and manage key pollution sources and contaminants, support the implementation of a kaimoana enhancement plan for the mātaihai, and consider how regional and district planning processes can better support the goals of *Whaka-Ora, Healthy Harbour*.

Specific actions that will be implemented that will affect this band include:

- Key Focus Area - Erosion and sedimentation: Actions 1.6, 1.8., 1.11.
- Key Focus Area – Pollution: Actions 2.5, 2.7, 2.8, 2.9
- Key Focus Area – Terrestrial indigenous biodiversity: Actions 3.6, 3.7, 3.9, 3.10, 3.13.
- Key Focus Area – Marine indigenous biodiversity: Actions 4.1, 4.2, 4.3, 4.4, 4.5, 4.6.
- Research and Monitoring: Actions: 5.1, 5.2, 5.3, 5.4, 5.7, 5.6, 5.8, 5.9, 5.10, 5.11, 5.12, 5.15, 5.16, 5.17.and 5.18.











# Part III



*As we weave our korowai with the materials we have gathered in Part I and Part II, we must decide how we will decorate it. What will our finished korowai look like? What patterns will we use? We will decorate this korowai with various actions that when put together will ensure that the korowai we are weaving in this plan is one that protects and cares for Whakaraupō/Lyttelton Harbour. These actions will be grouped together in patterns – or Key Focus Areas – with some patterns being more prominent than others, and some underpinning the wider design, helping the other patterns shine. They all however come together to highlight the special features and beauty of each of the feathers and fibres that represent each ecological band, and the work done to harvest the ideas and principles from Part I.*

In this part of *Whaka-Ora, Healthy Harbour* we share our proposed actions – the things we can do to make our aspirations a reality. We have developed a work programme that both acknowledges and supports the work already being done in Whakaraupō/Lyttelton Harbour, and builds upon it with a list of new actions to be undertaken. The Partners have sought advice from many sources – a science advisory group, community workshops, mana whenua, learnings from those already active in the harbour, targeted feedback meetings, and expertise from within the partner organisations – when deciding on these actions.

The actions have been chosen based on their alignment with the three pou - or guiding principles. This means that there is a mix of projects that will support us to be change-makers, to lay the foundation of change for ourselves, and our children after us, and to work together in collaboration.

The actions are grouped into four key focus areas that address erosion and sedimentation, pollution, indigenous terrestrial biodiversity and indigenous marine biodiversity. There is also a suite of research and monitoring actions and other general supporting actions that focus on collaboration and alignment.

The actions are categorised as either priority projects (starting straight away), short-term projects (starting in the first 1-3 years), or longer term projects (starting after 4 years). The priority and short-term projects have resourcing either confirmed or actively being sought for their implementation. There is also resourcing through existing work programmes of all the Partners. However, the Partners recognise that implementation of this plan will require additional resourcing to implement the priority and short-term projects and therefore undertake to consider future funding stream and fund allocation from their organisations on an annual basis. The longer term projects will be reassessed and defined further as part of the three-yearly action review in 2021.

The Whakaraupō Partnership will champion the delivery of this plan by preparing a work programme which will identify a lead for each project. The 'project lead' does not have to be from a partner organisation; there are lots of different organisations and people who 'lead' projects within Whakaraupō/ Lyttelton Harbour already contributing to the kaupapa of this plan. For this reason, The Whakaraupō Partnership will support and encourage these (and new) groups to become 'leads' for projects in Whaka Ora, Healthy Harbour. This will ensure that we are all working in a collaborative and supportive way.

We know that it is important to have targets for measuring how the plan is progressing. However at the moment there is not enough baseline information to identify appropriate targets to measure change. For this reason, there are no targets identified in this document. The Partners recognise the role and need for targets and therefore there is a specific focus on research and monitoring to provide enough information set targets to inform our progress in the future.

## Priority Projects

We have identified priority projects – the ones we want to start first – as well as a suite of other important projects (listed in the Key Focus Area action tables, below). We expect that as the partnership continues, new projects will arise as we improve our understanding of our harbour and its challenges, and learn which actions are most successful. There are three sets of priority projects: action projects, science projects, and co-ordination projects.



The priority action projects are:

- **Working to reduce sedimentation in waterways (marine and freshwater)**
  - Working with landowners – farmers, foresters, owners of lifestyle blocks and residents - to implement practical solutions to reduce erosion and sediment loss (Actions 1.4, 1.5, 1.6)
  - Identifying appropriate short and long term solutions to reduce the contribution of sediment from roadside cuttings (Action 1.2 and 1.3)
- **A Head of the Bays initiative (Action 3.1)**
  - Re-establish wetland areas, including a raupō and harakeke reserve
  - Facilitate riparian restoration by land owners and the community
  - Publicise, provide advice and support practical solutions to address sediment sources (hotspots)
- **Complete riparian planting of the four permanently flowing streams (Actions 1.1 and 3.8)**
- **Actions to enhance kaimoana**
  - Supporting the Kaimoana Enhancement Plan for the Mātaitai (Action 4.1)
  - Mātaitai Kaimoana Species Restoration projects (Action 4.2).

These priority projects contribute to the pou of change-making, as they change how we do things and start the process of moving toward the future state of our environment that we set out in Part II. All these projects build on existing initiatives being undertaken by Tangata Tiaki, the Partners, the Banks Peninsula Zone Committee and the wider Whakaraupō/Lyttelton Harbour community.

These action projects will be implemented with ki uta ki tai in mind. Care needs to be taken that projects are not jeopardised by activities uphill or up stream. In some cases, work will need to start at the top of the catchment.

When developing the projects, the partners considered information and science gaps and recognised that in some cases the most important need is to increase understanding of drivers, risks and potential solutions. These science and monitoring projects contribute to the pou of “Mō tātou, ā, mō kā uri a muri ake nei”. We expect our knowledge to increase, and over time we and those who come after us will refine the projects within *Whaka-Ora, Healthy Harbour*. Table V sets out all the science and monitoring actions we need to undertake.

The priority science projects are:

- **Undertaking a State of the Takiwā (Action 5.1)**
  - Bring together all existing marine species and habitat monitoring
  - Understand the state of key kai moana, native biodiversity and invasive species
  - Understanding the distribution and threats to shellfish in the harbour

We also recognise that there are many valuable initiatives already underway within Whakaraupō/Lyttelton Harbour. When developing this plan it became obvious that there were opportunities to better align and co-ordinate actions. To link with our pou of collaboration we have included projects which seek to develop a way for everyone to see how their actions contribute to a whole picture, and to make sure work is aligned, duplication is avoided, and everyone has access to the latest information. Table VI sets out all projects that seek to integrate across agencies and the community.

The priority co-ordination actions within three years are:

- **Bringing together and jointly reporting on existing monitoring** (Action 6.2 with 5.8 and 5.9)
- **Initiating a process for integrating research projects** (Action 6.3 with 5.4 and 5.10).

# Complete List of Actions

Below is the full list of actions that are being recommended through this plan. They have been organised by the Key Focus Area they address. The Key Focus Areas and actions listed below were identified based on suggestions from the community during workshops at Diamond Harbour, Lyttelton, and Governors Bay in late 2016; consultation with the Tangata Tiaki from Rāpaki, and the Partners Working Group; recommendations from a science advisory group, and targeted feedback meetings held in October 2017. The Key Focus Areas are:

- Erosion and Sedimentation (Table I)
- Pollution (Table II)
- Indigenous Terrestrial Biodiversity (Table III)
- Indigenous Marine Biodiversity (Table IV)

There is also a list of supporting projects, including specific research and monitoring actions (Table V), and other actions we believe will help us reach our goal of restoring Whakaraupō/Lyttelton Harbour so that all those who call the area home can engage in mahinga kai (Table VI).

## Key Focus Area 1 – Erosion and Sedimentation

Sediment is a key pollutant in Whakaraupō/Lyttelton Harbour, caused by the soil that erodes from the land and settles to the bed of the streams and sea (sedimentation). Erosion and sedimentation are the most pressing issues within Whakaraupō/Lyttelton Harbour that we seek to address.

Reducing and managing the processes of erosion and sedimentation is a key step to improving the health and abundance of species that call Whakaraupō/Lyttelton Harbour home. Clearer water also encourages people to be more interconnected with their harbour and streams by making them more attractive to play and gather food in. At the moment, there is more sediment entering the harbour and waterways than is healthy, which is having negative effects on the habitats of our flora and fauna – particularly mahinga kai species. This means that populations are smaller and more isolated due to lack of habitat, and they are less healthy because of the effects of sedimentation on their breathing and feeding.

There are already initiatives being undertaken to reduce and manage erosion within Whakaraupō/Lyttelton Harbour such as community, council, and iwi led riparian planting, roadside cutting pilot projects, education programmes, and research and monitoring. Alongside these actions, we aim to implement best practice erosion and sedimentation control techniques, and reduce sediment inputs into the harbour and waterways through the actions outlined in Table I.



Table I

KFA 1: Erosion & Sedimentation			
ID	Action	Timeframe	Ecological Bands Impacted
1.1	Continue to support a ki uta ki tai re-vegetation and habitat enhancement initiative on all permanently flowing streams commencing with Te Wharau (Charteris Bay), Purau, Waiake (Teddington), and Waimawete (Living Springs/Allandale) Streams.	Priority Project	Streams
1.2	Facilitate a workshop of experts to identify short term solutions to reduce the contribution of sediment from erosion at roadside cuttings ahead of the implementation of the outcomes of Action 1.3.	Priority Project	Hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
1.3	Support, promote and implement the learnings from an erosion & sediment control pilot project on Lyttelton Harbour basin roadside cuttings to identify effective long term solutions to reduce the contribution of sediment.	Priority Project	Hills and lowlands
1.4	Addressing soil erosion from Port land including Erosion and Sediment Control Plans for all major earthworks projects on LPC land and an ecological planting masterplan for all of LPC's non-operational hill slope land	Priority Project	High outcrops, forests, hills, lowlands, taihua and foreshore
1.5	Develop and implement a programme to engage with foresters in the catchment to inform about sediment issues, enforce regional and national regulations for forestry earthworks and manage erosion and sediment from forests.	Priority Project	High outcrops, forests, hills and lowlands
1.6	Develop an integrated, multidisciplinary programme to target erosion and sedimentation in Whakaraupō. This will include: <ul style="list-style-type: none"> <li>Mapping key sediment sources and erosion hotspots</li> <li>Monitoring the locations and rates of erosion</li> <li>Monitoring the rates of sedimentation in the streams and the sea</li> <li>Promoting best practice erosion and sediment control techniques (Erosion and Sediment control toolbox, Builders Pocket Guide) for use in Whakaraupō for rural, residential, industrial, roading, agricultural, forestry and construction</li> </ul>	Priority Project	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
1.7	Continue to work with landowners to review the effectiveness of Farm and Forestry Environment Plans developed in Actions 1.5 and 1.8.	Within three years	High outcrops, forests Hills and lowlands
1.8	Implement best practice erosion and sediment control techniques by ensuring that they are adopted by all land owners and that all properties greater than 40 ha have an operational Farm Environment Plan (FEP) that addresses erosion and sedimentation.	Within three years	High outcrops, forests, hills and lowlands
1.9	Promote Whakaraupō as a "sediment sensitive catchment" and identify it as sediment sensitive in all relevant statutory/regulatory plans and strategies (e.g. Resource Management Act and Local Government Act plans and strategies) and programmes of work undertaken by public bodies.	Within three years	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
1.10	Implement the long-term solutions identified in Action 1.3 to reduce the contribution of sediment from erosion at roadside cuttings.	4+	Hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
1.11	Review statutory and non-statutory regional/city planning documents, strategies and bylaws to determine if they appropriately manage erosion and sedimentation for Whakaraupō/Lyttelton Harbour.	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams

## Key Focus Area 2 – Pollution

Other forms of pollution (aside from sediment) are also an issue in Whakaraupō/Lyttelton Harbour. Water quality is essential to providing a healthy and abundant environment for our Whakaraupō/Lyttelton Harbour community – both its people, and its flora and fauna. Improving the quality of the water in our streams and harbours can be done by reducing the amount of pollution entering the waterways. At the moment, pollutants in the water are stopping some species from thriving within the harbour, and making our community think twice about swimming and playing, or eating from our waters, which affects how people connect with Whakaraupō/Lyttelton Harbour.

There are already initiatives being undertaken to improve water quality within Whakaraupō/Lyttelton Harbour such as domestic sewage and stormwater system upgrades, stormwater upgrades for the Port and staff training, monitoring programmes, and stream fencing. Alongside these actions, we aim to be more active in improving water quality, and to reduce pollution of freshwater and marine environments through the following actions:

**Table II**

KFA 2: Pollution			
ID	Action	Timeframe	Ecological Bands Impacted
2.1	Continue to remove wastewater discharges from the harbour and to implement infrastructure upgrades to both storm water systems and waste water systems for harbour communities, including the diversion of wastewater to Bromley.	Within three years	Taihua/foreshore and harbour
2.2	Develop a stormwater management plan for Lyttelton harbour settlements and public land.	Within three years	Hills and lowlands
2.3	Develop Environmental Management Plans for port operations in line with national and international standards supporting continuous improvement.	Within three years	Taihua/foreshore and harbour
2.4	Encourage and undertake riparian planting and fencing to exclude stock from waterways, initially for all permanently flowing streams.	Within three years	Streams
2.5	Identify and promote pollution control practices that are appropriate for use in Whakaraupō to manage water quality effects associated with; <ul style="list-style-type: none"> <li>• Septic tanks</li> <li>• Non-consented water takes</li> <li>• Stormwater and wastewater discharges</li> <li>• Vessels</li> <li>• Port operations</li> <li>• Contaminants from other sources such as roads, roofing, carparks and pest plant control techniques</li> <li>• Industrial sites</li> </ul>	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
2.6	Encourage on-land treatment of all stormwater before discharging into waterways.	4+	Streams, taihua/foreshore and harbour
2.7	Review statutory and non-statutory regional/city planning documents, strategies, and bylaws to determine if they appropriately manage discharges into Whakaraupō waterbodies and to ensure they are aligned with <i>Whaka-Ora, Healthy Harbour</i> .	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
2.8	Implement a Harbour settlement storm water management plan.	4+	Streams, taihua/foreshore and harbour
2.9	Review existing waste management practices within Whakaraupō and develop an appropriate catchment-wide waste management programme, including: <ul style="list-style-type: none"> <li>• Education</li> <li>• Regular 'harbour clean-up days' to remove litter from beaches and waterways</li> </ul>	4+	Taihua/foreshore, harbour and streams





## Key Focus Area 3 – Terrestrial Indigenous Biodiversity

Our aspiration for Whakaraupō/Lyttelton Harbour is for the land to be teeming with life, including birds, reptiles, and invertebrates. To support this abundance of species, we will also need an abundance of plants – native trees, flaxes, flowers, and creepers – to create lush, healthy habitats for these animals. The crater rim to foreshore area of Whakaraupō/Lyttelton Harbour has large areas of introduced plant species, including grassed hillsides that would originally have been native bush. There are also a number of pest species such as possums, stoats, and feral cats that are making it hard for our native species to thrive.

There are already initiatives underway to increase terrestrial indigenous biodiversity within Whakaraupō/Lyttelton Harbour such as community, landowner and Port, pest weed and animal control, native species reintroduction programmes (i.e. tūi), and ecological restoration. Alongside these actions, we aim restore and rehabilitate more areas of mahinga kai and native habitat, increased native biodiversity and mahinga kai, and improve protection of mahinga kai and native biodiversity through the following actions:

Table III

KFA 3: Terrestrial Indigenous Biodiversity			
ID	Action	Timeframe	Ecological Bands Impacted
3.1	Support and seek funding for a Head of the Harbour rehabilitation initiative to: <ul style="list-style-type: none"> <li>Protect and restore mahinga kai and native biodiversity values</li> <li>Protect and reinstate wetlands as a natural way to control sediment</li> <li>Demonstrate good faith proactive partnerships with landowners</li> </ul> Re-establish raupō in Whakaraupō.	Priority project	Wetlands and saltmarsh
3.2	Publish indigenous planting guides for Lyttelton Harbour/Whakaraupō to support community in increasing native biodiversity.	Priority project	High outcrops, forests, hills, lowlands, wetlands, saltmarsh and streams
3.3	Continue to support a ki uta ki tai re-vegetation and habitat enhancement initiative on permanently flowing streams as set out in Action 1.1, and expand this where appropriate, to capture riparian margins on all streams.	Within three years	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
3.4	Develop a landscape scale biodiversity plan to guide habitat protection, restoration, planting and pest management priorities within the catchment for mahinga kai and other species. This should include developing guidelines and education material including a: <ul style="list-style-type: none"> <li>Landscape plan identifying existing habitat and potential connections between patches</li> <li>Native plant biodiversity and other appropriate planting for residential and publicly accessible land</li> <li>Options to improve protection of mahinga kai and native biodiversity values e.g. covenanting, customary harvest</li> <li>Pest plant and animal species management</li> </ul>	Within three years	High outcrops, forests, hills, lowlands, wetlands, saltmarsh and streams
3.5	Encourage new community led planting and pest plant management initiatives in each of Lyttelton, Rāpaki, Governors Bay, and Diamond Harbour.	Within three years	High outcrops, forests, hills, lowlands, wetlands, saltmarsh and streams
3.6	Develop a pā harakeke in an accessible location.	4+	Hills, lowlands, wetlands and saltmarsh



ID	Action	Timeframe	Ecological Bands Impacted
3.7	Develop, implement and support new and existing initiatives that improve awareness of the cultural and ecological value of native biodiversity, e.g: <ul style="list-style-type: none"> <li>• Interpretation panels</li> <li>• Information leaflets</li> <li>• School resources</li> </ul>	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
3.8	Review support for existing community planting initiatives and pest plant management programmes and seek to support continued momentum.	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore and streams
3.9	Ensure that appropriate management tools are in place to restore and rehabilitate priority areas for mahinga kai and native biodiversity.	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
3.10	Contribute to predator free Whakaraupō 2050.	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
3.11	Provide support for the Lyttelton Pest Management and Biodiversity Improvement project aimed at environmental education programme connecting schools with community/experts/organisations to develop and implement a monitoring and management programme to eradicate pests and improve biodiversity long term.	4+	High outcrops, forests, hills and lowlands
3.12	Develop an ethno-botanic planting area in a protected area which is aimed at explaining traditional uses of plants.	4+	Hills and lowlands
3.13	Review statutory and non-statutory regional/ city planning documents, strategies and bylaws to determine if they appropriately manage biodiversity and pests the Whakaraupō catchment and to ensure they are aligned with <i>Whaka-Ora, Healthy Harbour</i> .	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams

## Key Focus Area 4 – Marine Indigenous Biodiversity

As well as having healthy and abundant terrestrial species, we aspire to having full and thriving streams and marine environments. Our waters should be home to a wide array of native finfish, shellfish, birds, and marine mammals including dolphins and penguins. There will also be a healthy abundance of seaweed and sea grass that will create habitats for these species to thrive and grow. Currently biodiversity is lower that it would have been before human contact for a wide variety of reasons. This is an area that the community – particularly Tangata Tiaki – have been working hard to restore. Existing initiatives include the kaimoana enhancement plan, a wide range of monitoring and reseedling projects within the mātaītai, and community beach clean-up activities. Alongside these actions, we aim to increase diversity and abundance of kaimoana and native species through the following actions:

Table IV

KFA 4: Marine Indigenous Biodiversity			
ID	Action	Timeframe	Ecological Bands Impacted
4.1	Support the implementation of a Kaimoana Enhancement Plan for the Mātaītai, in addition to any requirements of resource consents.	Priority project	Harbour
4.2	Ensure that at least one new Mātaītai kaimoana species restoration project is initiated in the first three years of <i>Whaka-Ora, Healthy Harbour</i> , in addition to any requirements of resource consents.	Priority project	Harbour
4.3	Publish publicly the reports on marine biodiversity arising from LPC's baseline and other marine monitoring programmes.	Within 3 years	Taihua/Foreshore and harbour
4.4	Undertake a feasibility study for an experimental dredging project to provide enhanced opportunities for kaimoana.	Within three years	Harbour
4.5	Ensure that at least one new Mātaītai kaimoana species restoration project is initiated every year for the next 5 years.	Within three years	Harbour
4.6	Review statutory and non-statutory regional/city planning documents, strategies and bylaws to determine if they appropriately manage marine indigenous biodiversity and marine biosecurity in Whakaraupō and to ensure they are aligned with the Healthy Harbour Plan. Investigate the inclusion of shellfish food gathering standards into these documents. This will be supporting information for the scheduled review of the Regional Coastal Environment Plan.	4+	Wetlands, saltmarsh, taihua/foreshore and harbour

## Supporting Actions: Research & Monitoring

To help us achieve the changes we want in our Key Focus Areas, we have developed some supporting actions, specifically around science and monitoring (Table V).

There are many organisations and individuals who have contributed to our current understanding the Whakaraupō/Lyttelton Harbour environment and the species within it. These include Environment Canterbury, tangata tiaki, Ministry of Primary Industries, Lyttelton Port, and Christchurch City Council and the Universities of Canterbury and Otago. Research and monitoring is not something that only scientists do. The community and individuals play an important role in increasing our understanding of the environment and species within it. We have included an action (Action 5.17) to ensure the Partners investigate opportunities for and support existing community led monitoring programmes.

The following projects bring together and enhance existing research and monitoring to ensure we have a better understanding of pollutants and their sources, including and their effects on cultural and ecological health, acquiring better information on the state of mahinga kai and native biodiversity health to ensure we can improve protection for kaimoana and native marine biodiversity, and to increase our knowledge of harbour hydrodynamics and sediment transport and accumulation.

**Table V**

Supporting Actions: Research & Monitoring			
ID	Action	Timeframe	Ecological Bands Impacted
<i>Marine Species</i>			
5.1	Complete a state of the takiwā/state of Whakaraupō report that brings together all existing marine species and habitat monitoring information in order to understand the state of key kaimoana, native biodiversity and invasive marine species, by the end of the first year. This will include a whole harbour habitat map for sub-tidal/inter-tidal areas. Continue to report on the State of the Takiwa.	Priority project	Wetlands, saltmarsh, taihua/foreshore and harbour
5.2	Continue to report on the State of Whakaraupō combining all existing marine/freshwater science and cultural health information and evolve the report based on the findings of Actions 5.1 and 5.5 to 5.11.  Include a 'health index' & 'score-card' for the harbour that summarises our current state of knowledge incorporating Mātauranga Maori and Scientific knowledge.	Within three years	High outcrops, forest, hills, lowlands, wetlands, saltmarsh, taihua/foreshore, harbour and streams
5.3	Develop a prioritised list of research projects based on the findings of the state of Actions 5.1 and 5.5. to 5.11. These will improve understanding of kaimoana, native marine biodiversity, and factors affecting cultural and ecological health including: <ul style="list-style-type: none"> <li>• The role of Whakaraupō as a juvenile fish nursery</li> <li>• Patterns of bivalve distribution (specifically pipi), including the influence of hydrodynamics and sediment dynamics, recruitment and connectivity</li> <li>• Pulse versus press impacts of sediment on kaimoana</li> <li>• The most effective management mechanism(s) to rehabilitate and restore mahinga kai</li> <li>• Effects of ocean acidification</li> <li>• Upper harbour sedimentation</li> </ul>	Within three years	Wetlands, saltmarsh, taihua/foreshore and harbour
5.4	Initiate regular monitoring of shellfish flesh for contaminants and growth rates.	Within three years	Taihua/foreshore

Continued on next page



Table V continued

ID	Action	Timeframe	Ecological Bands Impacted
<b>Mahinga Kai Species</b>			
5.5	Develop and implement an integrated marine species and habitat monitoring programme that includes existing monitoring information and is based on the findings of Actions 5.1 and 5.5 to 5.11 and, considering the role of community monitoring.	Within three years.	Wetlands, saltmarsh, taihua/foreshore and harbour
5.6	Establish an effective marine indicator species monitoring and reporting framework to monitor long term marine environmental change, with a focus on pāua, pioke (rig), pātiki (flounder), tuaki (cockles) and karengo.	4+	Wetlands, saltmarsh, taihua/foreshore and harbour
5.7	Prepare a mahinga kai and habitat map including terrestrial and freshwater ecosystems and update every 5 years.	Within three years	High outcrops, forests, hills, lowlands, wetlands, saltmarshes and streams
<b>Harbour hydrodynamics and sedimentation</b>			
5.8	<p>Develop an agreed, integrated/multi-disciplinary Whakaraupō research programme focused on harbour hydrodynamics and sediment transport processes, including:</p> <ul style="list-style-type: none"> <li>• examining historical deposition patterns,</li> <li>• effects of coastal development,</li> <li>• bathymetry, and</li> </ul> <p>establishes a long term monitoring programme to monitor sedimentation rates and patterns, currents and tides, sea level, temperature, salinity and dissolved oxygen.</p> <p>Facilitate an expert panel review of the hydrodynamic and sediment transport model and review the model at least every 5 years to ensure it meets the needs of decisions making/future management challenges.</p>	Within three years	Harbour
<b>Pollutants (fresh water, marine and sediment)</b>			
5.9	Bring together all existing freshwater, harbour and sediment quality monitoring information, and provide an integrated State of Water Quality Report based on existing monitoring, for integration into a State of Whakaraupō report.	Within three years	Wetlands, saltmarshes, taihua/foreshore, harbour and streams
5.10	Develop and implement an integrated freshwater and marine water quality monitoring programme based on the findings of the State of Whakaraupō report.	Within three years	Wetlands, saltmarshes, taihua/foreshore, harbour and streams
5.11	Develop a prioritised list of pollutant research projects and actions based on the findings of the State of Whakaraupō Report.	4+	Wetlands, saltmarshes, taihua/foreshore, harbour and streams
5.12	Identify key pollution sources and contaminants, and their relative effects on fresh water and marine water quality.	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarshes, taihua/foreshore, harbour and streams
5.13	Develop and pilot new tools, and review and update existing tools to reduce contaminants entering waterways.	4+	High outcrops, forests, hills, lowlands, wetlands, saltmarshes, taihua/foreshore, harbour and streams

Continued on next page

Table V continued

ID	Action	Timeframe	Ecological Bands Impacted
<i>Erosion and sediment control</i>			
5.14	Develop and pilot new tools, and review and update existing tools, where required for land owners and users, on best practice erosion and sediment control techniques within Whakaraupō, including a cost benefit analysis of how erosion and sedimentation control can fit into a suite of viable land use alternatives.	4+	High outcrops, forests, hills, lowlands and wetlands and saltmarshes
5.15	Regularly monitor and report on sediment sources and erosion hotspots and track changes to the Harbour Sediment deposition rates and location over time.	4+	High outcrops, forests, hills and lowlands
5.16	Investigate tools to manage the spread of wilding pines, such as buffer plantings.	4+	High outcrops, forests, hills and lowlands
5.17	Continue to improve understanding of the effects of sedimentation on the cultural and ecological health of freshwater and marine environments.	4+	Wetlands, saltmarshes, taihua/foreshore, harbour and streams
<i>Other</i>			
5.18	Investigate opportunities for and support existing community led monitoring programmes.	Within three years	High outcrops, forests, hills, lowlands, wetlands, saltmarshes, taihua/foreshore, harbour and streams
5.19	Investigate the effects of sea level rise on sediment accumulation, key beach resources, kaimoana and native marine biodiversity and coastal infrastructure, and provide for mechanisms to allow for managed retreat of the coast.	4+	Wetlands, saltmarshes, taihua/foreshore and harbour

## Supporting Actions: Coordination and alignment with other initiatives

The final table (Table VI) sets out actions that will help us continue to work together more effectively, and create a strong platform for future generations.

Table VI

Supporting Actions: General			
ID	Action	Timeframe	Ecological Bands Impacted
6.1	Continue to develop the healthy harbour website and use it as a central information site for publicly available data, including research, state of the environment monitoring and consent monitoring.	Within three years	High outcrops, forests, hills, lowlands, streams, wetlands, saltmarsh, taihua/ foreshore and harbour
6.2	Maintain all monitoring programmes outlined in Table IV in an integrated way, provide regular reviews and reporting and develop targets when the information is available to report progress.	Within three years	High outcrops, forests, hills, lowlands, streams, wetlands, saltmarsh, taihua/ foreshore and harbour
6.3	Provide a coordination function for science/research proposals so that all research is aligned with <i>Whaka-Ora, Healthy Harbour</i> and develop a prioritised list of research needs.	Within three years	High outcrops, forests, hills, lowlands, streams, wetlands, saltmarsh, taihua/ foreshore and harbour
6.4	Use the recommendations of the state of the takiwa, harbour hydrodynamics and sediment transport research, pollutant research and all monitoring programmes to continually revise actions under this plan, and develop measurable progress targets.	4+	High outcrops, forests, hills, lowlands, streams, wetlands, saltmarsh, taihua/ foreshore and harbour
6.5	Review the effectiveness of the current regulatory framework, and identify opportunities to make the framework enabling for proven restoration actions, where required, to ensure: <ul style="list-style-type: none"> <li>Alignment with the goals of <i>Whaka-Ora, Healthy Harbour</i></li> <li>Providing for Ki uta ki tai integrated catchment management</li> <li>Enabling implementation of the Key Focus Area Actions</li> </ul>	4+	High outcrops, forests, hills, lowlands, streams, wetlands, saltmarsh, taihua/ foreshore and harbour
6.6	Identify how <i>Whaka-Ora, Healthy Harbour</i> might provide proactive direction to inform emergency recovery activities for extreme events such as storms, fire, and earthquakes.		High outcrops, forests, hills, lowlands, streams, wetlands, saltmarsh, taihua/ foreshore and harbour
6.7	Review and update (where required) hazard response plans for Whakaraupō Harbour (oil / chemical spills).		Taihua/foreshore
6.8	Review the effectiveness of existing maritime protocols, compliance, and enforcement activities to ensure that they appropriately manage introduced invasive marine species.		Wetlands, saltmarsh, taihua/foreshore and harbour
6.9	Review statutory and non-statutory regional/city planning documents, strategies, and bylaws to determine if they are aligned with <i>Whaka-Ora, Healthy Harbour</i> . The Regional Coastal Environment Plan is scheduled for review in 2020.		High outcrops, forests, hills, lowlands, streams, wetlands, saltmarsh, taihua/ foreshore and harbour





# Accountability and Review

*Once we finish this korowai we gift it to our community and environment of Whakaraupō/Lyttelton Harbour. However, our work is not yet done. We must continually check it; making sure it does not develop any holes, that it is the right shape and fit - warm enough, dry enough - and fit for purpose. If we notice that it is not fulfilling its purpose of protecting our harbour we must make additions and repairs. In this same way, we must develop methods to hold ourselves accountable to this plan, and check in periodically to ensure it is still fit for purpose and, when needed, make additions or changes.*

Environment Canterbury, Christchurch City Council, Lyttelton Port Company, Te Hapū o Ngāti Wheke and Te Rūnanga o Ngāi Tahu have a Memorandum of Understanding (MOU) that sets out their commitment to collaborating on a long term basis in the delivery, implementation and the review of this plan.

The Partners will work together and align work programmes toward the goal of improving ecological and cultural health of Whakaraupō/Lyttelton Harbour in accordance with 'ki uta ki tai' (from the mountains to the sea).

The Partners will recognise Te Hapū o Ngāti Wheke as tangata whenua holding mana whenua and mana moana for Whakaraupō/Lyttelton Harbour.

## Oversight

A Governance Group has been formed comprising the following representatives:

- A Councillor from Canterbury Regional Council;
- A Councillor from Christchurch City Council;
- The Chief Executive of Lyttelton Port Company Limited;
- A senior representative of Te Hapū o Ngāti Wheke; and
- A senior representative of Te Rūnanga o Ngāi Tahu.

This governance group is responsible for:

- Supporting and ensuring collaboration and where possible alignment of work programmes amongst the Parties to contribute towards the Project;
- Approval of an annual Project plan and budgets;
- Considering options for future funding streams; and
- Setting up a Partners Working Group to deliver the work programmes.

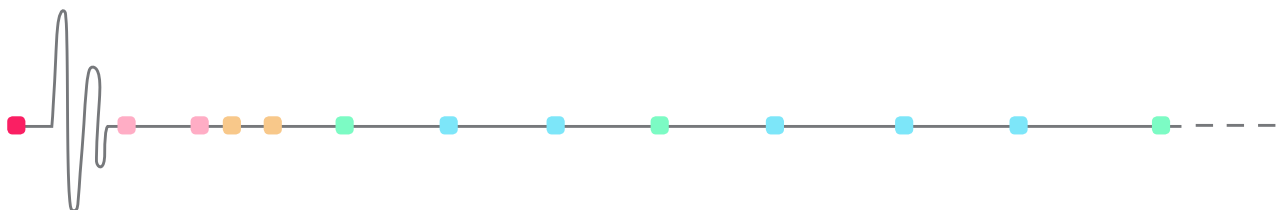
## Funding

The Partner organisations have committed funding of \$600,000 over a 3-year period ending in 2018 plus additional resourcing where required, to develop the catchment management plan and for its initial implementation. The MOU contains a commitment to confirm funding and resources for the following three-year period (out to June 2021).

There is also resourcing that comes through existing work programmes of all the Partners. However, the Partners recognise that implementation of this plan will require additional resourcing to implement the priority and short-term projects and therefore undertake to consider future funding stream and fund allocation from their organisations on an annual basis.



## Plan Timeframe



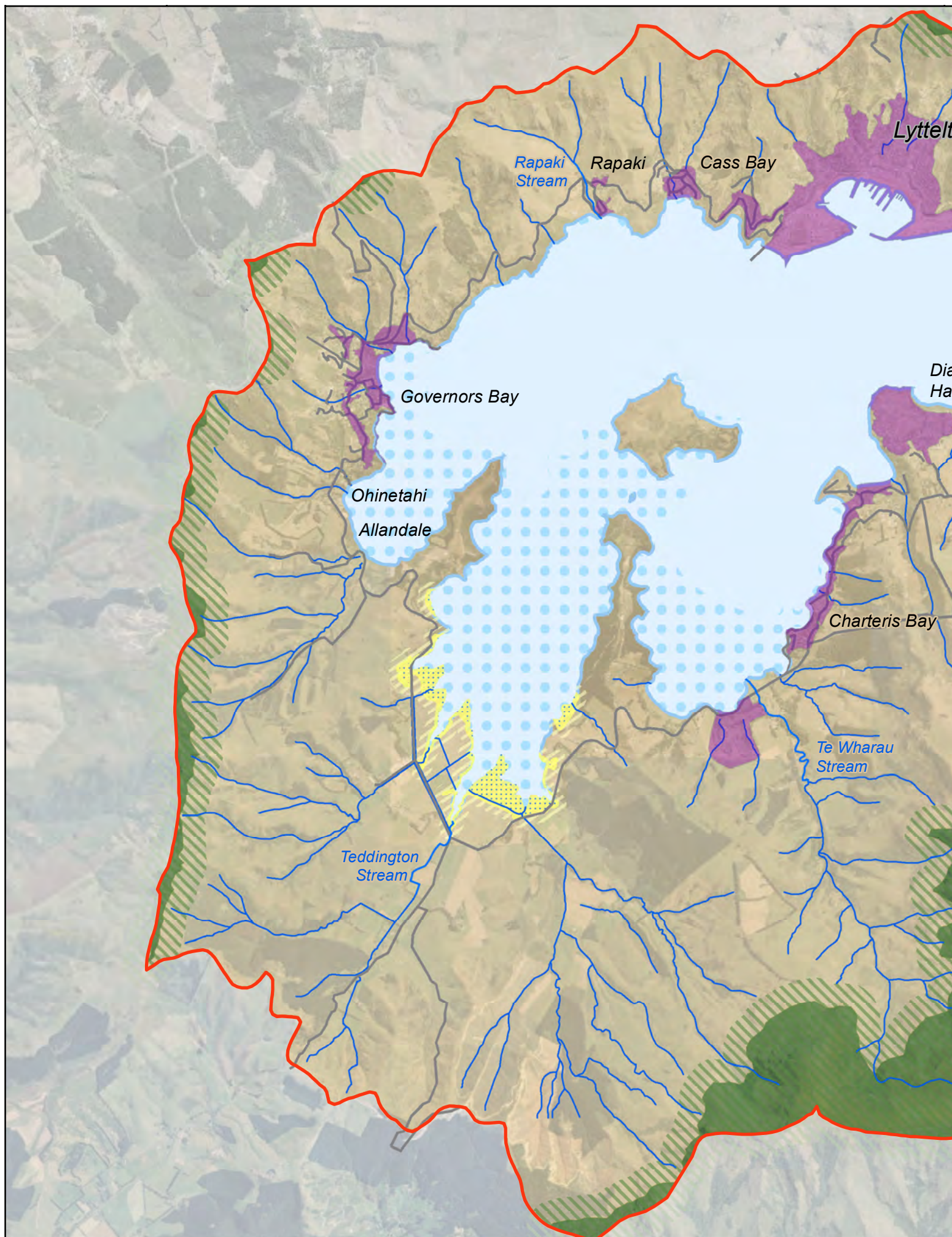
1. 2010-2011: Christchurch Earthquake Sequence – Major damage caused to Lyttelton Port infrastructure
2. 2015: Lyttelton Port Recovery Plan came into effect – included commitment for the catchment management plan to be developed
3. 2016: MOU between Te Hapū o Ngāti Wheke, Te Rūnanga o Ngāi Tahu, Canterbury Regional Council, Christchurch City Council and Lyttelton Port Company Limited signed to begin catchment management plan process. Whakaraupō Catchment Management Plan Governors' Group established, as well as a Partners' Working Group with representatives from the five partners, the Banks Peninsula Zone Committee and Banks Peninsula Community Board
4. 2016: Community engagement workshops held in Lyttelton, Diamond Harbour, and Governors Bay
5. 2017: Draft Catchment Management Plan released
6. 2017: Catchment Management Plan launched
7. 2021: Three-yearly action review
8. 2024: Three-yearly action review
9. 2027: Catchment Management Plan review
10. 2030: Three-yearly action review
11. 2033: Three-yearly action review
12. 2036: Three-yearly action review
13. 2040: End of Plan life. Opportunity to draft new plan for next phase of Whakaraupō/Lyttelton Harbour's regeneration

## Review and reporting on the plan

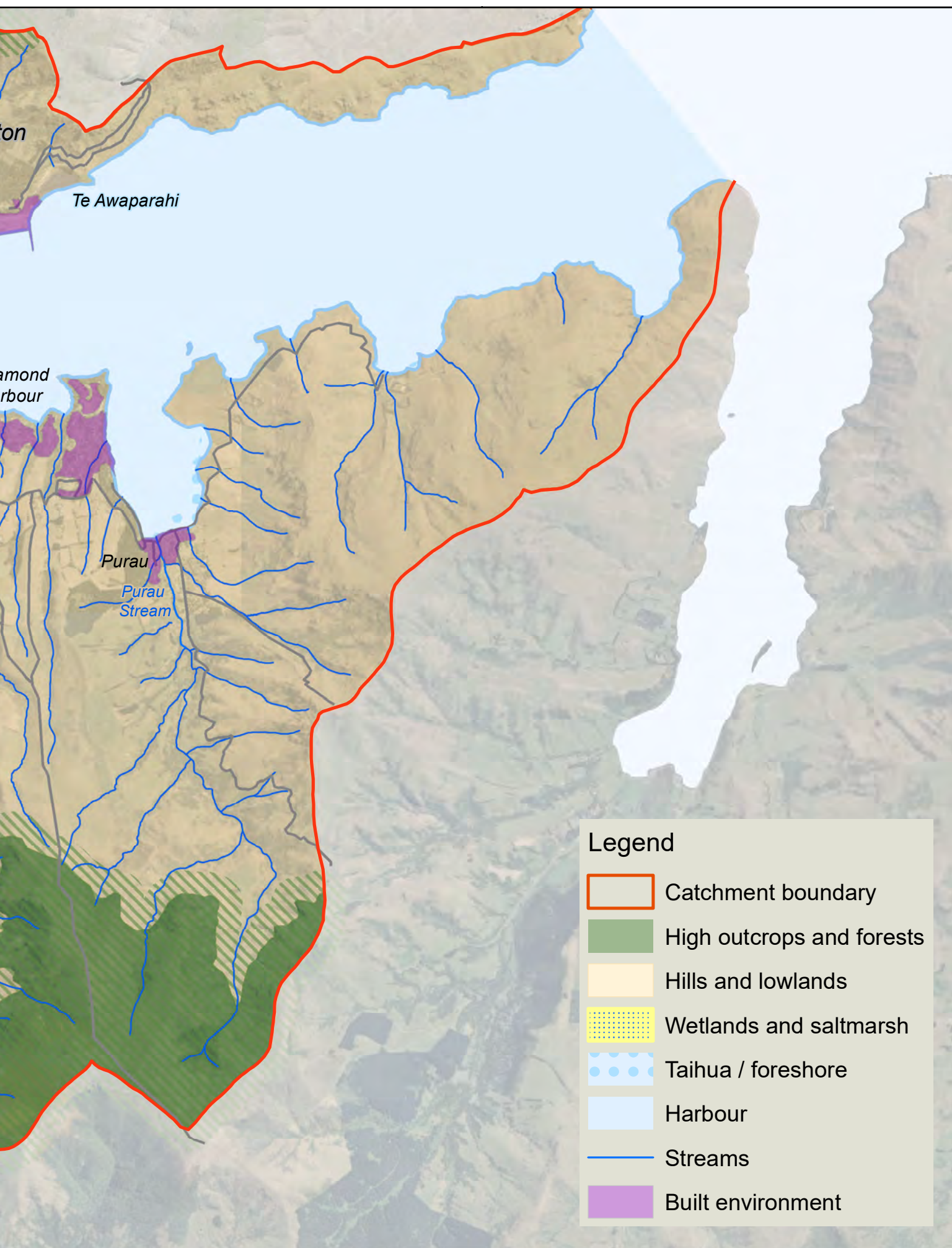
The Partners will produce an annual report of progress on the actions in *Whaka-Ora, Healthy Harbour*. This report will be co-ordinated with State of the Takiwā and monitoring reporting.

The actions in *Whaka-Ora, Healthy Harbour* will be reviewed every three years and as part of that process the Partners will seek feedback from the community.











# Glossary

## Glossary of terms and abbreviations - general

<b>Ephemeral stream</b>	Stream that flows only sometimes, often during and following a period of rainfall in the immediate locality
<b>Erosion</b>	The action of surface processes that remove soil or rock from one location, and then transport it away to another location
<b>Hapū</b>	Traditional kinship group, subtribe
<b>Kaitiaki</b>	Custodian, someone with a responsibility to a place/resource
<b>Kaupapa</b>	Purpose, topic
<b>Ki uta, ki tai</b>	Catchment-based environmental management
<b>Korowai</b>	Traditional cloak made of plant and animal fibres
<b>Mahinga kai</b>	Refer to kaupapa section of document
<b>Mana whenua/mana moana</b>	The local indigenous people who hold tribal authority over a location based on ancestry and occupation
<b>Marine indigenous biodiversity</b>	A diverse – or wide range - of native species that live on or in water (i.e. fish, shellfish). This includes diversity within species, and between species
<b>Mātaihai</b>	Customary fishing area established under the Fisheries Act 1996
<b>Memorandum of Understanding</b>	An agreement between two or more parties indicating an intended common line of action
<b>Non-statutory</b>	Not legally binding, not relating to law or statute
<b>Papatipu Rūnanga</b>	One of 18 governing bodies representing parts of the Ngāi Tahu takiwā
<b>Pou</b>	A ceremonial post used to mark places of significance. Used in this plan as a metaphor for a guiding principle
<b>Riparian margin</b>	River edges
<b>Road cuttings</b>	The process of digging out hillsides to make way for roads
<b>Sedimentation</b>	The act of particles, such as dirt, suspended in water coming to rest against a solid surface, such as a harbour or river bed.
<b>Takiwā</b>	Region
<b>Tangata tiaki</b>	Legally appointed person responsible for managing fisheries resources for customary food gathering within a mātaihai or taiapure
<b>Tangata whenua</b>	Local indigenous people of an area
<b>Taonga</b>	Treasure
<b>Terrestrial indigenous biodiversity</b>	A diverse (or wide range) of native species that live on, above or in the land (i.e. birds, mammals, insects). This includes diversity within species, and between species
<b>Whāinga</b>	Goal
<b>Whakaraupō</b>	Lyttelton Harbour

## Glossary of terms - species

Inanga	Whitebait
Harakeke	Flax
Horopito	Pepperwood
Houhere	Narrow leaved lacebark
Kāhu	Harrier hawk
Kākahi	Freshwater mussel
Kanakana	Lamprey
Kārearea	NZ falcon
Karoro	Seagull
Kererū	Wood pigeon
Kōkopu	Cockabully
Kororā	Penguin
Korimako	Bellbird
Kōtare	Kingfisher
Kōura	Freshwater crayfish
Kuaka	Godwit
Kūtai	Mussel
Miromiro	Tomtit
Ongaonga	Tree nettle
Pātiki	Flounder
Pioke	Rig
Pīpipi	Brown Creeper
Pīhoihoi	Pipit
Pōhuehue	Muhlenbeckia
Pūh`a	Watercress
Raupō	Reeds
Rūrū	Morepork
Taramea	Golden spaniard
Tītī	Sooty shearwater
Tōi	Mountain cabbage tree
Tōrea	Oyster catcher
Tuaki	cockles
Tuna	Eel
Whairepo	Stingray
Whauwhaupaki	Five finger









