

TE AWARUA-O-PORIRUA HARBOUR AND CATCHMENT Strategy and Action Plan

Updated March 2015



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Foreword

Tena koutou katoa. We are pleased to make public this document – the **Te Awarua-o-Porirua Harbour and Catchment Strategy and Action Plan**.

A huge amount of time, energy, research and collaboration has gone into this by a diverse collection of qualified individuals, groups and organisations.

This document is the first of its kind to specify how we will tackle the challenges facing the harbour and catchment. We acknowledge all those who have contributed to this in some way. It is something they can be proud of ... yet this is just the beginning.

The **Te Awarua-o-Porirua Harbour and Catchment Strategy and Action Plan** is a living document. It is reviewed every three years and new information accommodated within the Action Plan as it becomes available.

Can the harbour be saved? The overwhelming scientific evidence from extensive research is an unreserved “Yes!”

Who is going to save it? We all are – the people of the Porirua basin, by working individually and through our councils and the other agencies that have an interest and a responsibility to do so.

Now is the time to take action... while we still can!

Na matou noa, na.

Nick Leggett
 Mayor
 Porirua City Council

Celia Wade-Brown
 Mayor
 Wellington City Council

Fran Wilde
 Chairperson
 Greater Wellington
 Regional Council

Taku Parai
 Chairman
 Te Rūnanga
 o Toa Rangitira



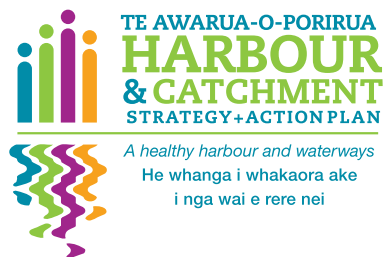
From Ngati Toa Rangatira

E ngā mana, e ngā reo, e ngā karangatanga maha kei waenganui i a koutou, nau mai, haere mai ki raro i te korowai mahana nei o Ngāti Toa Rangatira. He mihi tēnei ki a koutou katoa o te hāpori nei o Porirua.

He mea taketake ana ki a tātou katoa o te rohe nei, ko te āhua me te oranga o te moana nei a Porirua. E whai ake nei ētehi kōrero rautaki hei hāpai i ngā mahi e pā ana ki te manaaki, e pā ana ki te āta tiaki i tēnei taonga puiaki o tātou.

Greetings to the many peoples, to the many voices, and to the many affiliations that we share together within our community of Porirua. Ngati Toa Rangatira extends a warm welcome to you all.

The health and sustainability of Te Awarua-o-Porirua Harbour and our natural environment is a matter of vital importance to Ngati Toa Rangatira and all people within our local and extended communities. The following strategic plan outlines a number of community goals and outcomes for the long-term health and sustainability of this unique and precious resource.



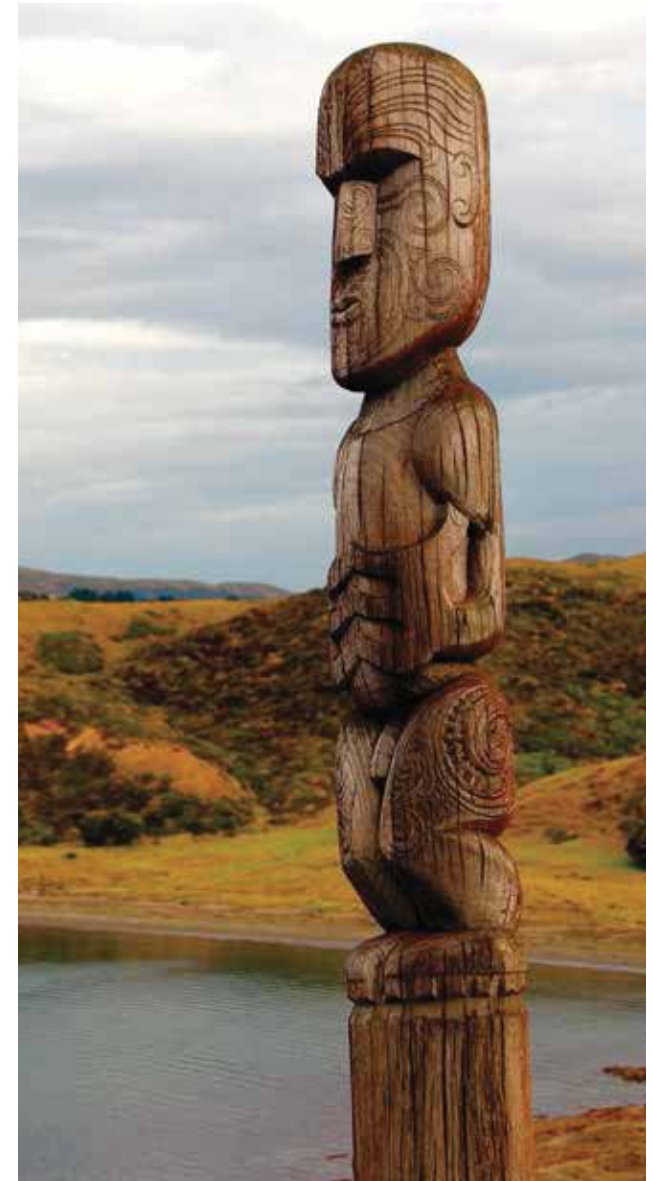
THE TE AWARUA-O-PORIRUA HARBOUR AND CATCHMENT STRATEGY AND ACTION PLAN logo represents the Porirua community's relationship with its harbour through the coming together of family/whanau at the waters edge – the reflection is a statement of connection, identity and involvement, and its clarity, of ecological health and well-being.

The four figures also represent the four key stakeholders – Porirua City Council, Wellington City Council, the Greater Wellington Regional Council and Ngati Toa Rangatira.

The shape of the figures can also be seen to represent the wahi pou, illustrated on the right, which stands as a guardian over the land surrounding Te Awarua-o-Porirua Harbour.

The importance of the vision statement 'A healthy harbour and waterways' is emphasised by its use in the logo and its translation into Maori – the language of the manawhenua – which acknowledges the vital stake that Ngati Toa Rangatira has in the land and its waters.

The positioning and typographical styling of the title and vision statement is deliberate – the former representing strength and fortitude in mostly land-based activity, the latter the result of that activity as manifest in the health of the harbour and its waterways. The colours are based around blue and green – colours of ecological health of sea and land.



Te Awarua-o-Porirua Harbour and its catchments

Te Awarua-o-Porirua Harbour is an estuary and outer harbour lying 20km north of Wellington City. The harbour catchment stretches north-south 28km from Pukerua Bay to Johnsonville, and east-west 15km from Titahi Bay to Haywards Hill. It is a focal point for Porirua City and a gateway to the Wellington region.

TE AWARUA-O-PORIRUA HARBOUR comprises two arms – the larger Pauatahanui Inlet (470ha) and the Onepoto Arm (240ha) – a harbour entrance and outer harbour facing Cook Strait and the Tasman Sea. The catchment and harbour boundaries covered by this Strategy are shown in Figure 1.

The inner estuary area is about 8km² and the catchment covers 185km² comprising pasture (45.8%), native forest and scrub (15%), exotic forest and scrub (22.8%), and an increasing proportion of urban development (13.8%).

The harbour is a significant local and regional ecological resource. It is the largest estuary in the lower North Island. It is the only one with any significant seagrass cover and it has one of the largest cockle concentrations in New Zealand. Pauatahanui Inlet is a nationally significant location for wetland bird species: 18 out of 35 (51%) of the wetland bird species recorded in Pauatahanui Inlet have conservation threat rankings of 'Threatened' and 'At Risk'.



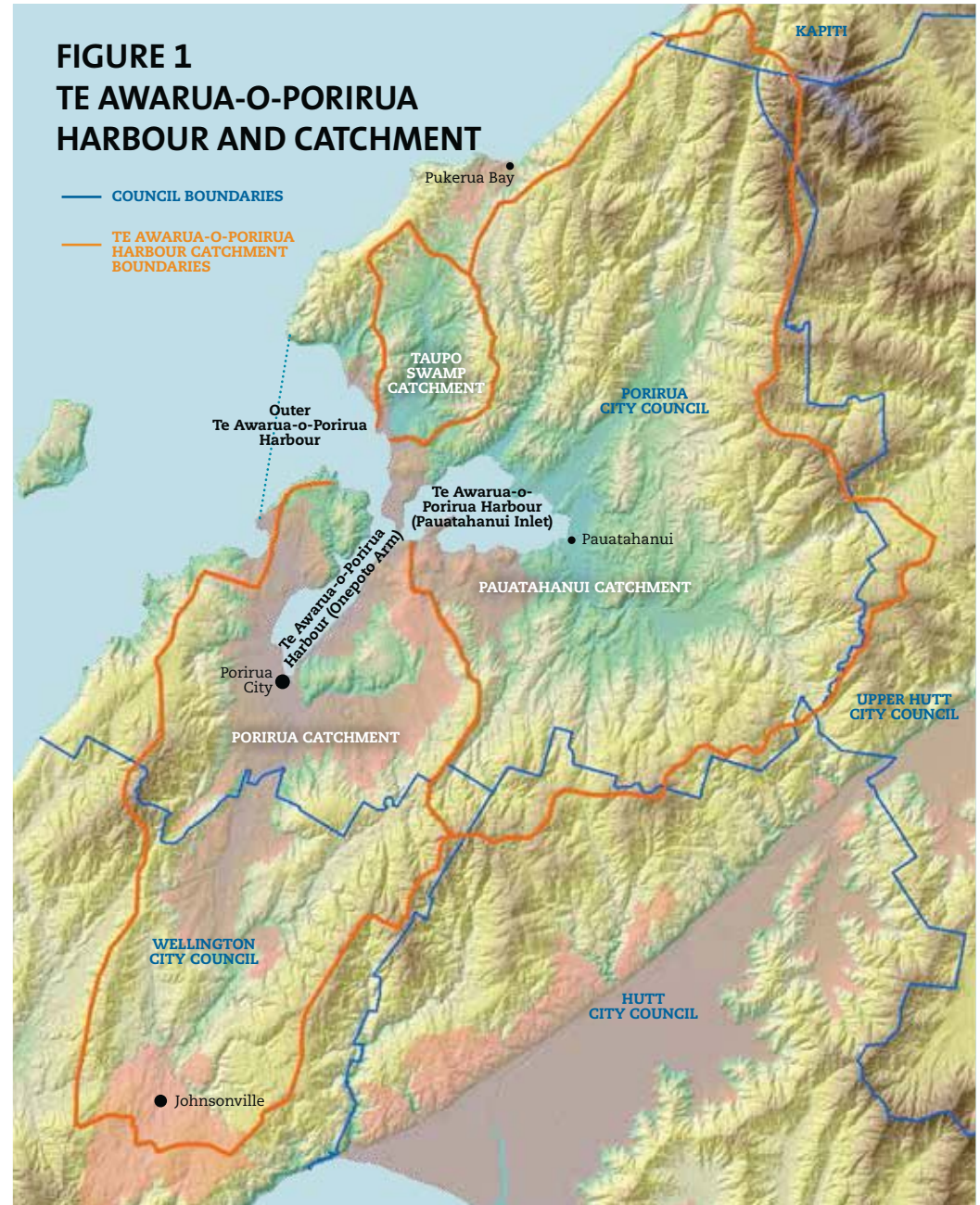
Te Awarua-o-Porirua Harbour has been the home of local iwi and manawhenua **Ngati Toa Rangatira** since the early 1800s. It was once a significant traditional food, plant and recreational resource.

Porirua City has a population of 51,000. A further 30-40,000 people live in the **Wellington City** part of the Porirua Stream catchment. Thousands of people pass through the harbour and catchment each day on trains, cars and other vehicles. The Porirua basin is also a major growth area.

The harbour is also an important recreational asset for Porirua City and the Wellington region. As such, the harbour provides a significant environmental, social, recreational, cultural and economic resource.

WHAT IS AN ESTUARY?

An estuary is a place where freshwater and saltwater mix and creates a special habitat for communities of plants and animals adapted for these conditions.



A tale of neglect and misuse

The past 150 years have seen a gradual but extensive degrading of the dynamics and ecosystems of Te Awarua-o-Porirua Harbour, largely through radical changes to the land use within its catchment and modification of the harbour edge.

The harbour and its surrounding forested catchment first attracted settlement by Ngati Ira, then in the 19th century, by Ngati Toa Rangatira. The harbour provided this strong sea-faring iwi with a rich source of seafood and shelter for waka.

European settlement began in the early 1800s. Writings and paintings from the 1850s describe tall, dense lowland podocarp forest and hardwood trees (kahikatea, totara, rimu) from the skyline to the water's edge. By 1885 this forest cover was mostly gone – stripped for pasture and farming.

Conversion of forest to farmland continued through the early 1900s. Mana, Paremata and Plimmerton became small seaside hamlets. New roads, rail and bridges increased access to and through the harbour and its catchment, promoting the process of reclamation and other harbour edge modification.

In the 1950s, Porirua was being groomed as a satellite suburb to Wellington City, with extensive state housing development and motorway expansion. Porirua Hospital peaked at 2,000 patients – its untreated sewage pumped directly to the Porirua Stream and harbour.

Industrial and commercial development followed and housing spread throughout the catchment and gradually surrounded the harbour. Further up the

Very little of the original shoreline is left in the Onepoto Arm due to reclamation and road developments.

catchment, Tawa and Johnsonville similarly developed. Porirua grew into the modern city we have today, but despite significant reclamation, the commercial centre of the fledgling city turned its back on the harbour.

The area around the harbour also developed as a significant transport corridor. State Highway 1 and the North Island main trunk rail line pass the length of the catchment and fringe the harbour, crossing it via bridges at the outlet of the Pauatahanui Inlet. State Highway 58 traverses the length of the eastern catchment and fringes Pauatahanui Inlet.

Abandoned, neglected and misused, the harbour and its tributaries deteriorated throughout this time. Pollutants from roads, stormwater and sewerage systems fouled the harbour, particularly the Onepoto Arm. Sediment run-off increased with urban development and associated earthworks.

Modifications to the harbour edge and streams resulted in the loss of important intertidal spawning, nursery and feeding grounds for marine life. Many remaining shellfish beds became contaminated and



unsuitable for eating. In the late 1970s public health warning signs started to appear at key locations in both arms of the harbour.

Despite repeated protest by local iwi and reassurances from central government, much of the cultural resources of the harbour were either lost or became unusable. Recreational activities such as swimming, waka ama, sailing, rowing, kayaking, windsurfing and speed-boating are also affected by the excessive sediment build-up in the harbour and poor water quality.

Future development – such as the Transmission Gully Motorway, forest harvesting, wind farm development, and Porirua City's own growth within Porirua basin – could further affect the health of the harbour. All of Wellington City's greenfield development (turning pasture into housing) up to 2030 will occur in the Porirua basin.

A harbour to be nurtured and treasured...

Te Awarua-o-Porirua Harbour is a natural treasure – a unique and beautiful environment that would be the envy of many cities around the world. While rural and urban development and other land uses have already done severe ecological damage, it is not too late to intervene.

What's at stake?

The community has spoken of the values they appreciate and treasure about the harbour. They have expressed to councils a strong desire for the harbour to be better protected and improved where possible. They want to see initiatives put in place to clean up and protect the harbour.

There are a range of significant values at stake that warrant such intervention:

Natural processes – Support of the natural processes within an estuary that ensure maintenance of water quality, habitat and bird and marine life.



A class trip to the harbourside – both fun and educational

Public enjoyment – The enjoyment of the significant recreational, ecological, educational, aesthetic and spiritual resource provided by the harbour.

Economic resource – A resource that attracts new inhabitants and investment, with significant potential to utilise this resource further.

Community identity – The identity of Porirua and suburbs as a coastal city and the significant recreational, aesthetic and economic benefit derived from this perception and reality.

Attractiveness – The coastal outlook and estuary ambience attracts appropriate development and investment.

Reputation – Porirua's reputation as an innovative and future-looking city is at stake. Porirua has a

rare natural resource and opportunity to join the growing number of global 'eco-cities'.

Traditional resource – Local manawhenua, Ngati Toa Rangatira, have been the community most affected by the changes to Te Awarua-o-Porirua Harbour. The iwi are realistic about the likelihood of restoring a pristine harbour, but they still have hopes of harbour conditions being significantly enhanced, with improvement occurring to some kaimoana locations and safer harbour-based activities.

Mana – the mana, cultural standing and kaitiakitanga of Porirua City and its manawhenua continue to be impaired by the condition of the harbour waiora and kaimoana.

The Strategy and Action Plan

Armed with a strong public mandate for action, Porirua City Council, Greater Wellington Regional Council and Wellington City Council in partnership with Ngati Toa Rangatira, and with the support of other agencies and the community, have developed this *Te Awarua-o-Porirua Harbour and Catchment Strategy and Action Plan*.

The Vision

The community, the councils and other agencies have been unwavering about the kind of harbour they would like to see – and not see – in the future.

A wide range of uses and values exist and are acknowledged in the Mission Statement for the *Te Awarua-o-Porirua Harbour and Catchment Strategy and Action Plan*, which can be summarised as:

“A healthy catchment, waterways and harbour, enjoyed and valued by the community”

The Strategy and its stakeholders

The first scientific study of the harbour and harbour issues occurred in the late 1970s in response to proposals to run a motorway across the western end of the Inlet and major development of Pauatahanui.

Neither project proceeded but they stimulated a major research exercise and the 1980 production of the first inventory and assessment of the inlet's resources, *Pauatahanui Inlet: an environmental study* by the DSIR. This was a critical baseline for observing future changes in the inlet.

Community groups have had a significant impact in monitoring harbour changes, raising awareness and advocating for the harbour's protection. Positive progress has been achieved through planting programmes, sediment and stormwater management, reserve development and litter management, particularly in the Pauatahanui Inlet.

The Pauatahanui Inlet Community Trust (PICT) was established in 2002 as an advocate for the inlet and led development of the first multi-agency action document *Pauatahanui Inlet Action Plan: Towards Integrated Management* (PIAP) and also the *Pauatahanui Inlet Restoration Plan*. These were the forerunners to the current Strategy and Action Plan.

PICT has also been instrumental, along with councils, in establishing the recent Te Awarua-o-Porirua Harbour and Catchment Community Trust (PHACCT) in recognition of the need to manage both arms of the harbour. Community groups, particularly PHACCT, have contributed to the Strategy, and will fulfill an important public education role, as well as monitor progress in implementation of the Strategy

In 2006, **Porirua City Council**, through significant funding provisions in its Long-term Council

Community Plan, began the current approach to identifying and addressing the underlying issues of the whole harbour.

By 2008 the Te Awarua-o-Porirua Harbour programme was established and support and partnerships were developed with those who have a stake in the harbour and its future.

Greater Wellington Regional Council recognises the significance of Te Awarua-o-Porirua Harbour and the challenges faced. Its Regional Policy Statement has influenced the direction of the current review of its regional plan and the actions of local authorities. The Council recognises the impact management of the three regional parks in the catchment will have on the harbour and waterways.

Wellington City Council is already addressing sediment, water quality and infrastructure issues in the upper 70% of the Porirua Stream within the city's northern boundary (25% of the total harbour catchment). This is important because most of Wellington City's future new development will occur in the top of the Porirua Stream.

Porirua City Council, Greater Wellington Regional Council, Wellington City Council and **Ngati Toa Rangatira** formed a partnership as key stakeholders to work together to produce the *Te Awarua-o-Porirua Harbour and Catchment Strategy and Action Plan* – a comprehensive set of initiatives to address the issues facing the harbour and provide some coordinated prioritisation of remedial action and funding.

These four stakeholders formed part of an inter-agency advisory group to share information and help inform the development of the Strategy and its Action Plan. Other agencies included the NZ Transport Agency, the Department of Conservation, the Ministry of Fisheries, Regional Public Health and community groups.

In 2009, a series of public seminars were held, followed by community workshops and release of a public discussion brochure on proposals to protect and improve harbour conditions. These provided background to the original initiative and gained feedback on the values and the kind of actions that the community felt needed to be undertaken to improve the health of the harbour and its catchment.

Public consultation on the draft Strategy and Action Plan was held in September 2011.

Broad priorities

This public and agency consultation formed the foundation for the development of this Strategy and Action Plan and identified a clear set of broad priorities for strategic action:

- General and targeted education and awareness programmes.
- Increased enforcement activity, capability and resources.
- Strengthened controls over land management such as urban and rural development, forest harvesting, and planned and improved foreshore and stream litter management programmes.
- Strong inter-agency collaboration and cross-boundary consistency; effective political leadership;
- Infrastructure improvement and innovative or 'best practice' approaches – stormwater, sewerage, landfill and roads.

The Strategy and Action Plan addresses these priorities and the commitment of agencies, particularly the three councils, to the formulation of policies and taking practical action towards cleaning up the harbour.

The intent of the Strategy is increasingly reflected in the respective councils' planning documents, including their Long Term Plans. The councils are also guided by and have regard to the Strategy when considering specific actions and programmes for inclusion within their respective Long Term Plans

The Management Principles

The agencies involved have agreed that their actions and involvement will be guided by the following principles:

- 1. Integrated management of harbour and catchment resources**
 - Treat the estuary, streams and catchment as one ecological system
 - Maintain and, where appropriate, improve the current multi-agency, cross-boundary and multi-disciplinary approach
 - Coordinate decision-making and ensure consistency
 - Develop targeted solutions that address, resolve and monitor particular issues
- 2. Priority given to restoring, conserving and enhancing the catchment, waterways and estuary values.**
 - The bottom-line for management and resource-use decisions is: "Will this protect or enhance the natural resources of the harbour and catchment?"
 - Protect and enhance species, habitat and ecosystems – marine, freshwater and terrestrial
- 3. Environmental sustainability**
 - Development and use of the natural and physical resources of the harbour and catchment should ensure biological systems are diverse and productive, and the long-term environmental, social and economic wellbeing of the community is maintained or improved
 - Promote environmentally wise infrastructure management, land ownership, use and management
 - "Living well within our environment"
- 4. Evidence-based decision-making and management**
 - Decisions to be based on best credible information available
 - Targeted research and monitoring to fill knowledge gaps
 - Accountable and adaptive management processes
 - Establish and maintain informed management processes
- 5. Effective community, business and agency involvement and stewardship**
 - Develop and maintain effective public information systems
 - Promote community involvement in decision-making processes and restoration activities
 - Reflect the aspirations of the community
 - Develop and maintain active partnerships between agencies and with the community
 - Foster compliance with guidelines and regulatory controls such as resource consent conditions
- 6. Recognise the special relationship of mana whenua Ngati Toa Rangatira with the harbour**
 - Involve in key decision-making fora
 - Recognise traditional values

These principles also reflect the concerns and contributions of the community and local iwi and have influenced the approach and guided the development of the Strategy and Action Plan.

The 'Big Three': Sediment, pollution, ecology

The health of Te Awarua-o-Porirua Harbour has been the subject of extensive research over the last 30 years. Research has intensified since the harbour programme began in 2008. This research has identified three key issues facing the harbour: excessive sedimentation rates, pollutants and ecological degradation – the 'Big Three'.

1. Excessive sedimentation rates

All estuaries accumulate sediment over time. In healthy estuaries the rate of accumulation is less than 1mm per year. Analysis of bathymetric (sea floor) surveys from 1974 and 2009 indicates sedimentation rates over that 35 year period averaged about 6mm per year in the Onepoto Arm and 9mm per year in the Pauatahanui Inlet (Gibbs & Cox 2009). A 2014 survey has shown that current rates are likely to be less than this, though still significantly more than a healthy 1mm per year.

DREDGING

Dredging could be a tool to manage sediments (such as mud, sand, and gravel) in Te Awarua-o-Porirua Harbour and may help to improve harbour flushing, navigability or beach replenishment.

However, dredging produces a number of challenges, including its impacts on ecology and coastal processes, costs, resource consents, supporting research, and what to do with contaminated sediments. The focus is now on the reduction of sediment entering the harbour.

The Strategy and Action Plan recognises that sand and mud flats are natural features of estuaries, but that excessive sedimentation rates are a problem for the harbour.

There are two broad sources of sediments affecting the harbour – terrestrial and marine:

- **terrestrial sediment** originating from erosion-prone rural land, streambank erosion, and development earthworks.
- **marine sand** from the outer coast has pushed into the sheltered confines of the inner harbour, where, through tidal currents and the aid of predominantly northerly winds, it has redistributed through the lower reaches of each arm of the harbour. Coastal developments such as the Mana Marina, road and rail bridges and other structures are likely to have impacted this process. Research suggests there is now little marine sand entering the harbour.

The primary source of excessive sedimentation in Te Awarua-o-Porirua Harbour is terrestrial. Silt is smothering the seabed, affecting the seagrass and shellfish and may be depleting the harbour's ability to attract and sustain fish. Localised reduction in harbour depths is affecting navigability for motor craft, sail boats, waka and kayaks. It is also undermining the harbour's visual attractiveness.

Reclamation and sedimentation have progressively reduced the amount of water that moves in and out of the harbour with the tide (its 'tidal prism') and this affects the harbour's ability to flush sediments and pollutants.

Sedimentation is considered the greatest threat to the future viability and usability of the harbour.

2. Pollutants

Heavy metals, pesticide residue, excess nutrients, vehicle emissions and pathogens make a number of locations in the harbour unsuitable for swimming or other contact with the harbour. Litter is another important contaminant that has visual and ecological impacts.

Chemical pollutants

A small but potent range of chemical pollutants are accumulating at a few key locations in the harbour:

- heavy metals, especially zinc (from sources such as galvanised-iron roofing and vehicle tyre wear), and to a lesser extent copper (from brake pad wear) and lead (leaching from soils following historic use in petrol);
- PAHs (polycyclic aromatic hydrocarbons), from vehicle exhausts, household fires and industry, anything where incomplete combustion occurs; and
- DDT, a pervasive residue from historical use of the now banned pesticide.

High concentrations of heavy metals and PAHs occur in the accumulated sediments around the Porirua Stream mouth with elevated levels also present throughout the sub-tidal basin of the Onepoto Arm; concerning levels of DDT occur throughout both arms of the harbour.

Sources of chemical pollutants include roads, roofing, residential properties, and illegal discharges from business and industrial users. These contaminants are collected in the stormwater system and discharge into the harbour and streams, particularly following rainfall.

These chemical toxins are high enough to cause concern if continued discharge, accumulation and concentration occurs in the harbour sediments.

Biological pollutants

These are water-borne viruses and bacteria, mostly from human or animal excrement. Sources include:

- broken or illegal sewer connections and sewer overflows
- fouling by livestock, domestic animals and waterfowl into watercourses or via the stormwater system.

Pathogens are the major health-risk to water-based recreational users, particularly between the Porirua Stream mouth and the Onepoto boatsheds, and in Brown's Bay.

They also threaten the edibility of fish and shellfish from parts of the harbour. These areas have 'no take' health warning signage.

Excessive nutrients

The key nutrient affecting the harbour is nitrogen, mostly from sewer cross-connections and livestock effluent.

While nitrogen is a naturally occurring nutrient essential for plant growth, excessive levels inhibit seagrass growth and can result in the widespread proliferation of oxygen-hungry algae. Oxygen depletion reduces water and sediment quality and their suitability for fish and invertebrates living on the harbour bottom.

Widespread growth of nuisance algae is highly visible throughout the harbour at low tide in summer – notably the bright green sea lettuce known as *Ulva* and the dark red *Gracilaria*. Their presence causes localised depletion of sediment oxygen, nuisance odour and can deprive native seagrass of light leading to its eventual decline. There are already small but growing patches of uninhabitable, dark, smelly anaerobic sediments in the Onepoto Arm.

Litter

Litter is also a significant contaminant in parts of the harbour. Litter is unsightly and also interferes with the dynamics and ecology of the estuary.

3. Ecological degradation

Sedimentation, pollution and direct harbour edge modification have significantly destroyed areas of the original estuary habitat and reduced critical subtidal, intertidal and harbour edge ecologies.

Estuaries are one of the most productive ecological communities and their loss may have major impacts on offshore and near-shore fisheries. Te Awarua-o-Porirua Harbour is the only estuary in the lower North Island with significant areas of seagrass. However, the extent of the seagrass beds is significantly reduced throughout the harbour. Seagrass provides habitat important to feeding, spawning, and as a nursery and refuge for marine invertebrates, fish and birds.

Reclamation, modification and sedimentation have resulted in a major loss of habitat for subtidal and intertidal plants. Ongoing human-induced changes continue to threaten the harbour environment.

Less than 5% of once extensive saltmarsh remains in the Onepoto Arm. While wetland and saltmarsh are more extensive in the Pauatahanui Inlet, areas of

beneficial seagrass are severely reduced in both arms of the harbour.

Some areas of remnant saltmarsh are being lost due to significant erosion caused by man-made structures. The growth of nuisance algae, such as *Ulva*, are out-competing the seagrass and contributing to its reduction in the harbour.

Similarly, streams and riparian (streambank) habitat continue to be heavily modified throughout the Te Awarua-o-Porirua Harbour catchment.

A lack of appropriate streambank vegetation increases water temperatures, decreases water quality, reduces spawning, nursery, refuge and food resources, and reduces the nutrient filtering functions of riparian areas.

However, all is not lost. Ecological surveys to date show that both arms of the harbour still have a firm basis for a sound ecology – that is, if we reduce and better manage the impacts of human development in the catchment then improvements in the ecological 'health' of the estuary are possible.

CLIMATE CHANGE & SEA-LEVEL RISE

Changing climate and rising sea level will impact the Te Awarua-o-Porirua Harbour and catchment system.

A sea-level rise of 1.95mm/year since 1930 has been established for the harbour. Consistent with national and global trends, this rate is likely to increase.

The specific impact of this rise and its interaction with an already complex and dynamic system is unknown. Sedimentation rates in the harbour currently exceed sea-level rise and will continue to affect the ability of the harbour to flush itself.

Climate change is predicted to increase the magnitude and frequency of rainfall events for western New Zealand, including the Porirua basin.

Potentially this will increase erosion and consequently terrestrial sediment runoff from both the rural and urban area.

These changes will continue to be recognised in the future planning and management of the harbour and catchment.

The objectives, indicators and targets

Key objectives and actions

The Te Awarua-o-Porirua Harbour and Catchment Strategy sets in place three key objectives:

1. Reduce sedimentation rates
2. Reduce pollutant inputs
3. Restore ecological health

These are shown in Table 1, together with the general actions in response. The Strategy and Action Plan has a particular and deliberate focus on reducing sediment and pollutants at their *sources*, where ever possible.

Indicators and targets

Table 2 breaks the objectives down into a list of indicators, current condition and target levels, and a date by which the target could realistically be achieved.

For each objective, the best indicators of health or healthy outcome have been chosen. Sampling will occur at multiple sites.

Each indicator has established baseline data against which future improvement can be measured. Where it is difficult to determine specific targets for some indicators at this stage, specific future research or monitoring form part of the Strategy to establish these. Better definition of targets will be incorporated as information becomes available, and included in revised versions of the Strategy.

The actions required to achieve these objectives and their targets are outlined in the Action Plan on pages 14-19.

TABLE 1: KEY OBJECTIVES AND ACTIONS	
1. Reduce sedimentation rates	<ul style="list-style-type: none"> • Improve land management and land use practices • Catchment protection and re-vegetation • Localised management of marine sand banks and improved harbour flushings, where appropriate
2. Reduce pollutant inputs	<ul style="list-style-type: none"> • Reduce faecal inputs • Cap nitrogen inputs • Reduce toxicant inputs • Additional litter management <p>The focus is on identifying and stopping pollutants at their source.</p>
3. Restore ecological health	<ul style="list-style-type: none"> • Estuary re-vegetation (seagrass and saltmarsh) • Streambank (riparian) re-vegetation and habitat enhancement – note that riparian planting will also help filter and reduce sediment and nutrient inputs

Youth sailing camp in the Onepoto Arm



TABLE 2: INDICATORS AND TARGETS

INDICATOR	CURRENT CONDITION	TARGET	DATE	COMMENT
1. Reduce sedimentation rates				
Annual sedimentation rate	Excessive sedimentation rate – exceeding a ‘healthy’ 1mm per year maximum.	Interim: 50% reduction in current sediment inputs from all tributary streams.	2021	Priority sediment sources will be identified for targeting reduction in sediment inputs to the harbour. The target of 1mm per year is appropriate and achievable for this kind of catchment and harbour. Modelling and field measurement of bathymetric survey 2011/2012 refined understanding of current sedimentation rates. Monitoring of sedimentation rates will be done through 5-yearly bathymetric re-survey and analysis and measurements from sediment plates installed at strategic locations in both arms of the harbour. Recent research helped establish doubts over the the feasibility and likely effectiveness of localised dredging.
		Long term: 1mm per year average rate for both arms.	2031	
2. Reduce pollutant inputs				
Faecal indicator bacteria counts	Multiple occasions annually where bathing water quality is breached in the harbour, especially the Onepoto Arm.	Recognised high-use recreational spots in the harbour have a ‘Suitability for Recreation Beach Grade’ of at least “Good”. Improved kaimoana safety from selected gathering locations, consistent with public health advice.	2021	Regular water contact should be safer for a range of water sports in both arms of the harbour. Main source of faecal inputs is sewerage/stormwater infrastructure (leaks, cross connections and wet weather overflows). Recognise that there will always be high health risks for kaimoana gathered from any areas subject to urban run-off.
Dissolved nitrogen levels in tributary streams, total nitrogen levels in estuary sediments, and percent cover of nuisance algae in intertidal areas of the harbour	Mild nutrient enrichment in estuary sediments, reflected in nuisance algal cover (eg, sea lettuce) in parts of both arms of the harbour.	Maintain nitrogen at existing levels or better and no net increase in the cover of nuisance algae on the intertidal flats.	2021	Of the two key nutrients – nitrogen and phosphorus – nitrogen is at a level that needs to be managed. The main source is the sewerage and stormwater networks, with some also coming from rural subcatchments. Research has shown that excessive nutrient levels are inhibiting sea grass growth in the harbour.
Toxicants in harbour sediments – especially zinc, copper, lead and polycyclic aromatic hydrocarbons (PAHs)	Some toxicants, zinc in particular, are reaching early warning trigger levels in places in Onepoto Arm sediments. DDT is also present at elevated levels in both arms.	Target significant reduction from Porirua Stream and Semple Street stormwater outfall.	2016	Zinc is the most prevalent heavy metal accumulating in Onepoto Arm. Other toxicants present include copper, lead and PAHs. Porirua Stream and the Semple Street stormwater outfall are the major sources of toxicants.
		Maintain/reduce concentrations of zinc and other toxicants at/below ANZECC ‘low’ sediment quality guidelines.	2021	
Harbour litter amounts	Excessive litter accumulation in southern Onepoto.	Significant reduction in litter accumulations in and around harbour.	2016	The southern end of the Onepoto Arm has the worst litter problem in the harbour.
3. Restore ecological health				
Estuarine plant cover	Less than 1% of original saltmarsh coverage remains in Onepoto Arm. Diminished seagrass cover throughout the harbour.	Establish saltmarsh cover in suitable areas of harbour, especially the Onepoto Arm. Significantly expand the distribution of seagrass beds throughout harbour.	2021	Saltmarsh and seagrass are essential as spawning, nursery, feeding and refuge areas for fish. Saltmarsh and seagrass also act as seabed stabilisers and sediment and pollutant filters.
Riparian (streambank) plant cover	Limited riparian cover in many streams.	Implement sustainable land use plans that include riparian protection for Whitireia, Battle Hill and Belmont Regional Parks.	2016	Research has now assisted the determination of location and effective extent of riparian rehabilitation.
		Establish riparian plant cover along majority of stream length, particularly in Horokiri, Pauatahanui and Porirua streams.	2031	Riparian vegetation improves in-stream conditions for fish and stream insects and other aquatic life. It also provides streamside habitat, reduces streambank erosion, and filters sediments and pollutants.
Stream and harbour bed communities	Poor and stressed sediment communities.	Stream and harbour bed communities improved to accepted ‘healthy’ levels.	2031	Regular monitoring and assessment of stream and estuary bed communities will continue. A harbour fish survey provided a baseline to assess fish community improvement and further remedial activity.

The Action Plan

The tables on pages 14-21 outline the Action Plan – a programme of activities to achieve the Te Awarua-o-Porirua Harbour and Catchment Strategy’s objectives. This has been updated from the 2012 document

There is one table for each objective, plus a table for activities that impact on all three:

1. Action Plan to Reduce Sedimentation Rates	14
2. Action Plan to Reduce Pollutant Inputs	16
3. Action Plan to Restore Ecological Health	18
4. Action Plan for activities that affect all three areas	20

Each table lists past, current, immediate and medium-to-longer-term activities and the agency or agencies responsible for taking a lead role.

The three-yearly Pauatahanui Inlet cockle count undertaken by volunteers



Activities are set out within four key areas:

- **Regulation** – of the activities adversely affecting the harbour and catchment.
- **Projects** – activities designed to have a direct impact on improving the health of the harbour and catchment environments.
- **Education and awareness programmes** – developing and implementing information and education programmes for the broad Porirua basin community, and also targeted programmes for specific sectors within the catchment. Education activities contribute to improved understanding, value formation and behaviour change
- **Research and monitoring** – ongoing assessment of the state of, and the impact of activities on, the harbour and its catchment.

Each activity is coded (eg, SB5, EC6) reflecting whether it is a sediment (S), pollutant (P) or ecology (E) activity or one that impacts on all three (T), and whether it is a completed (A), current (B), immediate (C) or medium-to-longer-term (D) activity.

The codes help identify the activity listed in the updated *Te Awarua-o-Porirua Harbour and Catchment Detailed Action Plan*, which provides more information on each of the Action Plan activities.

Current activities

Since the Te Awarua-o-Porirua Harbour programme was established in 2008, a significant number of activities of direct benefit to the harbour and catchment have begun, and some have already been completed – particularly in the past three years, since the original Strategy was adopted. The initial focus has been, and will continue to be, on reducing the various sources of sediment, as success in this area will provide the most widespread and effective benefits. These include:

- reducing smothering and other impacts on estuarine plants, aquatic life and habitat
- improving water clarity
- improving feeding opportunities for bird and fish species (related to improved clarity)
- improving harbour flushing capacity and maintenance of or improvement to the tidal prism
- reducing contaminants inputs, many of which adhere to sediments and are transported to the harbour by silt-laden streams and stormwater.
- planned catchment re-vegetation, which will not only reduce erosion and sediment but filter some pollutants and provide some reduction in peak flood flows.

Agency involvement

Improving Te Awarua-o-Porirua Harbour is a scientific, technical and planning challenge. The *Te Awarua-o-Porirua Harbour and Catchment Strategy and Action Plan* provides a blueprint for councils and other agencies to continue to work together with a common goal to improve the health of the harbour and its waterways.

Strategy partners can also use the Strategy to:

- review how work that relates to the harbour and catchment are being delivered;
- ask whether physical processes within the harbour can be improved;
- look for different or better ways to manage the harbour and catchment; and
- prioritise council and agency resources and effort.

The existing information sharing and coordination inter-agency groups – Porirua Harbour Interagency Advisory Group (PHIAG) and Harbour Science Group – and the key stakeholder (three councils and the Rūnanga) executive oversight group – the Strategy Oversight Team – will be maintained to facilitate coordination of Strategy implementation.

The Strategy and Action Plan is an active document. Councils receive ongoing submissions on the harbour and its catchment through their respective Annual Plan and Long Term Plan processes. The Strategy and Action Plan will help inform and focus decision-making within these processes, so that new activities align with its objectives and become part of its longer term actions and initiatives.



Community and business involvement

Cleaning up the harbour and its catchment is very much a community issue. A significant amount of harbour pollutants, litter and sediment comes from private properties and the actions of businesses and individuals.

A vital contribution to Action Plan initiatives – particularly in the reduction of sediment, contaminant and litter inputs – can come from individual, business and community actions motivated by an increased awareness, appreciation and respect for the harbour and catchment. It is hoped that the *Te Awarua-o-Porirua Harbour and Catchment Strategy and Action Plan* can act as a catalyst for community initiatives and involvement in harbour restoration. There will be increasing opportunities for the community to participate in hands-on projects such as planting and litter removal.

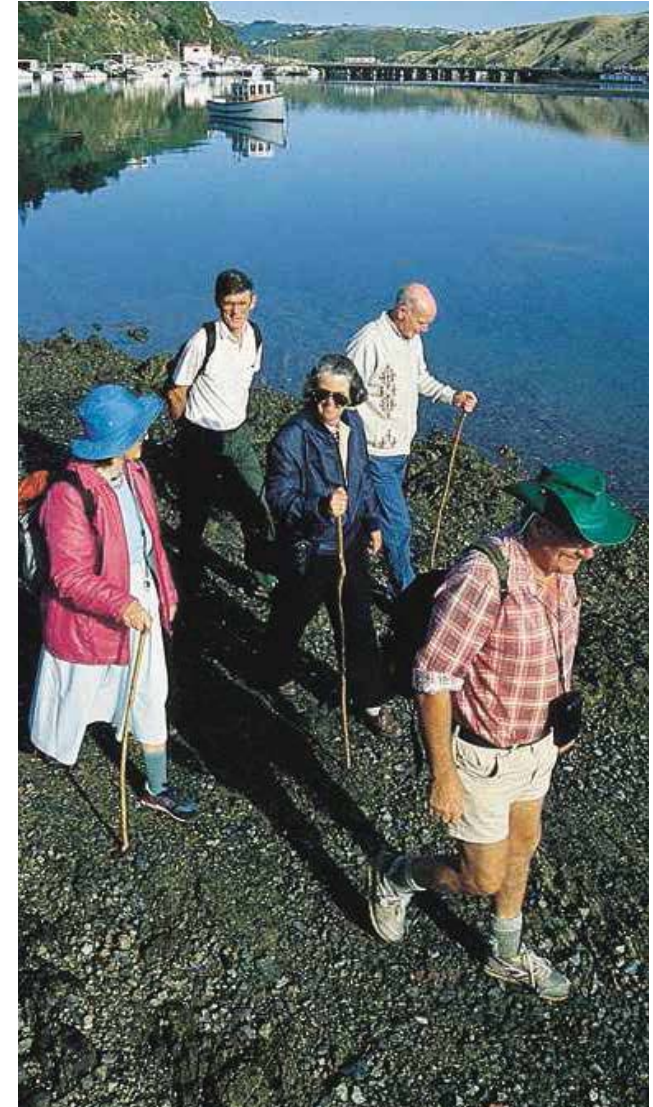
It is anticipated the Strategy and Action Plan will be also used by the community to gauge progress on actions, fulfilling objectives and meeting targets.

The Strategy and Action Plan can act as a catalyst for the community to support or promote future works through requests to the councils' Annual Plans and Ten Year Plans and through input into the processes and systems that govern how development occurs within the harbour catchment.

Community groups, particularly the Porirua Harbour and Catchment Community Trust (PHACCT), will fulfill an important role in monitoring Strategy progress, providing a coordinated community voice to Strategy activities, as well as facilitating public awareness of harbour and catchment issues.

Duck Creek Scenic Reserve is one of the remaining saltmarsh reserves on the Pauatahanui Inlet

A stroll around Golden Gate, Pauatahanui Inlet, at low tide



Action Plan to 1 Reduce Rates of Sedimentation

- VISION**
- To reduce sediment inputs to harbour and waterways to more natural levels
 - To significantly improve harbour water clarity and harbour flushing capacity

- CURRENT STATE**
- Excessive sedimentation rates, significantly over a healthy 1mm per year rate

- INTERIM TARGET**
- Reduce sediment inputs from tributary streams by 50% by 2021

- TARGET**
- Reduce sedimentation rates to 1mm per year by 2031 (averaged over the whole harbour)

- ISSUES**
- Excessive sedimentation rates are prematurely filling both arms of the harbour, and impairing harbour and stream ecology, affecting recreational use, and contributing to harbour pollution.
 - There is a cumulative impact on harbour sediment from bulk earthworks and building sites within the harbour catchment, and from erosion-prone rural land and streambanks
 - Marine sand banks are reducing the recreational use of some areas and have potentially adverse impacts on the flushing capacity of the harbour
 - There is a cumulative impact of harbour developments and structures on harbour flows, flushing and sediment transport
 - Gaps in our knowledge of harbour sediment and flushing dynamics
 - Pollutants are also accumulating in harbour sediments

P = Priority project

LEAD ROLES: PCC – Porirua City Council; WCC – Wellington City Council; GWRC – Greater Wellington Regional Council; Joint – Collaboration between PCC, WCC and GWRC; GOPI – The Guardians of Pauatahanui Inlet; PICT – Pauatahanui Inlet Community Trust; PHT – Porirua Harbour Trust

COMPLETED ACTIVITIES – SINCE 2006

REGULATION

SA1 ex-SA1	Completed revision and update of codes of practice for land development	WCC	
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PROJECTS

SA2 ex-SA7	Improved Duck Creek development environmental design	PCC	
SA3 ex-SA16	Completed an Erosion and Sediment Control Standard for State Highway Infrastructure	NZTA	

EDUCATION

RESEARCH

SA4 ex-SA19	Developed preliminary estuary and catchment sediment models	GWRC	P
SA5 ex-SA20	Completed the baseline and first follow-up 5-year bathymetric surveys and analysis	PCC	P
SA6 ex-SA21	Completed partnership with NZ Transport Agency on harbour modelling	PCC	P
SA7 ex-SA22	Investigated harbour sediment management needs and options	PCC, GWRC	
SA8 ex-SB13	Completed prioritised research of resource use and management tools – catchment/estuary modelling	GWRC	
SA9 ex-SC6	Investigated options to dredge access channel through Moorehouse Point sand bank	PCC	

CURRENT AND ONGOING ACTIVITIES				IMMEDIATE TERM – NEXT 3 YEARS				MEDIUM TERM – 3-10 YEARS																												
<table border="1"> <tr> <td>SB1 ex-SB2</td> <td>Revise erosion and sediment control guidelines for earthworks</td> <td>GWRC</td> <td></td> </tr> <tr> <td>SB2 ex-SA2</td> <td>Implement building site earthworks control bylaw</td> <td>PCC</td> <td></td> </tr> <tr> <td>SB3 ex-SA4</td> <td>Implement codes of practice for land development</td> <td>WCC, PCC</td> <td></td> </tr> <tr> <td>SB4 ex-SA5</td> <td>Implement Plan Change 70 (WCC) & 11 (PCC) to increase earthwork controls</td> <td>WCC, PCC</td> <td></td> </tr> </table>				SB1 ex-SB2	Revise erosion and sediment control guidelines for earthworks	GWRC		SB2 ex-SA2	Implement building site earthworks control bylaw	PCC		SB3 ex-SA4	Implement codes of practice for land development	WCC, PCC		SB4 ex-SA5	Implement Plan Change 70 (WCC) & 11 (PCC) to increase earthwork controls	WCC, PCC		<table border="1"> <tr> <td>SC1 ex-SB3</td> <td>Review building site earthworks, sediment and erosion controls and guidelines</td> <td>GWRC?</td> <td>P</td> </tr> <tr> <td>SC2 ex-SC1</td> <td>Review and update codes of practice for land development</td> <td>PCC?</td> <td>P</td> </tr> </table>				SC1 ex-SB3	Review building site earthworks, sediment and erosion controls and guidelines	GWRC?	P	SC2 ex-SC1	Review and update codes of practice for land development	PCC?	P					REGULATION
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BROAD-RANGING ACTIVITIES THAT INCLUDE THE REDUCTION OF RATES OF SEDIMENTATION, SEE PAGES 20-21

Action Plan to 2 Reduce Pollutant Inputs

VISION • To reduce pollutant inputs to, and sediment contaminants within, Te Awarua-o-Porirua Harbour and tributary streams

CURRENT STATE • Exceeding low trigger levels for zinc, copper and lead and harmful microbes (Onepoto) and nitrogen and pesticides (Onepoto and Pauatahanui)

TARGET • Reduce faecal inputs so that ‘Suitability for Recreation’ beach grades improve at least “Good”

- Cap nitrogen levels in the harbour (that is, no increase)
- Reduce toxicant levels in the harbour to ANZECC Sediment Quality Guidelines “Low” thresholds, particularly from the Porirua Stream and Semple Street outfalls
- Reduce harbour and stream litter

ISSUES • Multiple sources of pollutants – sewer and stormwater infrastructure, industrial, rural and urban

- Highest immediate impact on cultural, aesthetic and recreational values
- Particular litter challenges in Onepoto Arm
- Limitations on kaimoana gathering for areas subject to urban stormwater run-off

P = Priority project

LEAD ROLES: PCC – Porirua City Council; WCC – Wellington City Council; GWRC – Greater Wellington Regional Council; Joint – Collaboration between PCC, WCC and GWRC; RPH – Regional Public Health; DOC – Department of Conservation; GOPI – The Guardians of Pauatahanui Inlet; KPB – Keep Porirua Beautiful; PHT – Porirua Harbour Trust

COMPLETED ACTIVITIES – SINCE 2006

REGULATION

PA1 EX-PA2	Contracted a Trade Waste Officer	PCC, WCC	
PA2 EX-PB8	Commenced ‘Take Charge’ business education and monitoring programme in Porirua catchment	GWRC	P
PA3 EX-PB6 + PC7	Superseded Regional Stormwater Action Plan with Regional rules and Whaitua process	GWRC	
PA4 EX-PB3	Prepared a stormwater bylaw	PCC	P

PROJECTS

PA5 EX-PA10	Prepared a regional code of practice for drainage and water	PCC, WCC	
PA6 EX-PA13	Completed initial Porirua Stream delta clean-up	PCC	P
PA7 EX-PA17	Reviewed and improved the street sump maintenance programme	PCC	
PA8 NEW	Completed reticulation of sewage from Pauatahanui village	PCC	P
PA9 EX-PB4	Prepared a stormwater water quality improvement plan	PCC	P
PA10 EX-PB5	Reviewed harbour and catchment litter management programme	PCC	
PA11 NEW	Established internal litter management working group	PCC	

EDUCATION

RESEARCH

PA12 EX-PA18	Implemented targeted pollutant research projects	GWRC	
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CURRENT AND ONGOING ACTIVITIES

PB1 EX-PA1	Implement trade waste bylaws	PCC, WCC	
PB2 EX-PA3	Implement an onsite wastewater treatment bylaw	PCC	

PB3 EX-PA5	Implement illegal connection remedial strategy and action plan	PCC, WCC	P
PB4 EX-PA6	Progressive upgrade of domestic stormwater and sewer connections	PCC, WCC	
PB5 EX-PA8	Implement a 10-year stormwater network upgrade	PCC	P
PB6 EX-PA9	Accelerate a prioritised sewer network renewal plan	PCC	
PB7 EX-PA11	Maintain a sewage pollution elimination programme	WCC	
PB8 EX-PA12	Maintain the Pauatahanui Inlet annual foreshore clean-up	GOPI	P
PB9 EX-PA14	Maintaining a foreshore litter management programme & community partnership	PCC, PHT	P
PB10 EX-PA15	Install litter catchers on targeted street sumps	PCC	
PB11 EX-PB4	Implement a prioritised stormwater quality improvement plan	PCC	
PB12 EX-PB7	Commence a WCC sewage pollution elimination-type programme within the PCC district	WWL	
PB13 EX-PC2	Implement a revised set of building controls and guidelines	PCC, WCC	

PB14 EX-PB10	Develop a health risk communication plan for Te Awarua-o-Porirua Harbour	RPH, PCC	
PB15 NEW	Install 'Drains to Harbour/Streams' plates on targeted street sumps	PCC, WCC	

PB16 EX-PA19	Undertake regular assessments of sediment contaminants and related harbour or catchment monitoring	GWRC	
PB17 EX-PA20	Maintain a recreational water quality monitoring programme	GWRC, PCC	P
PB18 EX-EA17	Maintain regular surveys of estuary sediment communities and habitat	GWRC	P
PB19 EX-PC8	Identify and assess the significance of contaminants from the rail network	GWRC	
PB20 EX-PB11	Investigate sources of toxicants in the Porirua Stream catchment	GWRC	
PB21 NEW	Collate contaminated site information for the Te Awarua-o-Porirua Harbour catchment	GWRC	

IMMEDIATE TERM – NEXT 3 YEARS

PC1 EX-PB3	Implement a stormwater bylaw	PCC	P
PC2 NEW	Apply for resource consents to discharge from stormwater network to fresh and coastal waters	WCC, PCC	P

PC3 NEW	Engage Wellington Water Ltd, as the infrastructure leader, within the Harbour Strategy programme	Joint	P
PC4 NEW	Establish partnership with Wellington Water Ltd for environmental outcomes	Joint	P

PC5 EX-PB10	Implement a health risk communication plan for Te Awarua-o-Porirua Harbour	RPH, PCC	
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PC6 NEW	Investigate continuous microbial water quality forecasting in the harbour	GWRC	P
PC7 NEW	Establish a long-term water clarity monitoring programme for the harbour	GWRC	

MEDIUM TERM – 3-10 YEARS

PD1 EX-PC1	Review and enhance the work of Trade Waste Officer	PCC, WCC	
PD2 NEW	Initiate a regional stormwater forum to support the transition to managing waterways for contaminant limits	GWRC	P
PD3 NEW	Develop a strategic approach for managing the stormwater network for water quality limits set by Te Awarua-o-Porirua Whaitua Committee	PCC, WCC	P

PD4 EX-PC4	Revise and improve non-sumped vehicle-generated road-runoff treatment	PCC	
PD5 EX-PC5	Accelerate the illegal stormwater connection remedial action plan	WWL	
PD6 EX-PC6	Accelerate the strategic upgrade programme for sewer connection	PCC	

REGULATION

PROJECTS

EDUCATION

RESEARCH

FOR BROAD-RANGING ACTIVITIES THAT INCLUDE THE REDUCTION OF POLLUTANT INPUTS, SEE PAGES 20-21

Action Plan to 3 Restore Ecological Health

- VISION**
- Significantly healthier indigenous species habitat and better functioning ecosystems
 - Greater terrestrial, riparian and estuarine vegetation cover
 - Enhanced aquatic and avian biodiversity

- CURRENT STATE**
- Minimal estuarine vegetation and impaired estuarine and aquatic ecosystems – less than 1% of the original saltmarsh and reduced seagrass cover in the Onepoto Arm

- TARGET**
- Establish saltmarsh cover in all suitable areas of the harbour, especially in the Onepoto Arm
 - Extend seagrass cover
 - Increase riparian plant cover
 - Extensive catchment restoration

- ISSUES**
- Adverse impacts of numerous hard estuary edges on estuarine plant environment
 - Unknown ability of seagrass to re-establish

P = Priority project

LEAD ROLES: PCC – Porirua City Council; WCC – Wellington City Council; GWRC – Greater Wellington Regional Council; Joint – Collaboration between PCC, WCC and GWRC; F+B – Forest and Bird; DOC – Department of Conservation; QEII – QEII National Trust; GOPI – The Guardians of Pauatahanui Inlet; Carrus – Carrus Corporation; TROTR – Te Rūnanga o Toa Rangatira; NIWA – National Institute of Water & Atmospheric Research; PHT – Porirua Harbour Trust

COMPLETED ACTIVITIES – SINCE 2006

REGULATION

EA1 ex-EA3	Developed draft provisions for the protection of significant urban vegetation area	PCC	
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PROJECTS

EA2 ex-EA4	Completed the Okowai Lagoon Restoration Project	PCC	
EA3 ex-EA8	Completed a Porirua Reserves Management Plan	PCC	
EA4 ex-EB2	Completed an estuary ecological restoration options report	GWRC	
EA5 NEW	Completed a Porirua Stream Mouth & Estuary Enhancement Concept plan	GWRC	P
EA6 NEW	Prepared a Takapuwhia streams restoration plan	TROTR	

EDUCATION

RESEARCH

EA7 ex-EA16	Completed three-yearly cockle survey (2013) for the Pauatahanui Inlet	GOPI	P
EA8 NEW	Completed a feasibility assessment of seagrass restoration possibilities for Te Awarua-o-Porirua Harbour	GWRC	P
EA9 ex-EB5	Completed a fish survey of Te Awarua-o-Porirua Harbour	TROTR	P
EA10 NEW	Completed assessment of existing seagrass condition	GWRC	

CURRENT AND ONGOING ACTIVITIES				IMMEDIATE TERM – NEXT 3 YEARS				MEDIUM TERM – 3-10 YEARS					
EB1 ex-EA1	Implement Pauatahanui Wildlife Management Reserve Management Plan	F&B											REGULATION
EB2 ex-EA2	Maintain management of the Duck Creek Reserve	DOC											
EB3 ex-EA8	Implement a Porirua Reserves Management Plan	PCC											PROJECTS
EB4 ex-EA6	Maintain financial support for landowners entering in to QEII covenants	QEII											
EB5 ex-EA7	Maintain support for local body native forest covenants	PCC											
EB6 ex-EA9	Implement the Bothamley Park Restoration and Management Plan	PCC											
EB7 ex-EA10	Review and implement the WCC Biodiversity Strategy and Action Plan	WCC											
EB8 ex-EA11	Maintain the Community Greening Programme	WCC											
EB9 ex-EA12	Implement the Northern Reserve Management Plan	WCC											
EB10 ex-EA13	Implement the GWRC Parks Network Plan & the individual regional park operational plans	GWRC											
EB11 ex-SA6	Implement Pauatahanui Vegetation Framework's re-vegetation programme	GWRC	P										
EB12 ex-SA10	On-going weed control and restoration planting on DOC-managed land	DOC											
EB13 NEW	Implement the Porirua Stream Mouth and Estuary Enhancement Concept plan	GWRC, PCC	P										
EB14 NEW	Implement the Takapuwahia streams restoration plan	TROTR											
				EC1 ex-EB4	Promote re-vegetation and coastal/estuary care groups	GWRC							
				EC2 NEW	Implement 'Our Capital Spaces' open spaces and recreation framework	WCC							
										ED1 ex-EA5	Implement the Lower Porirua Stream Wetland Restoration Plan	GWRC	
										ED2 NEW	Prepare a Marine Action Plan	GWRC	
										ED3 DEFERRED ex-EB7	Prepare and implement a seagrass restoration plan	GWRC	
EB15 ex-EA14	Maintain community environmental programmes	GWRC, WCC											EDUCATION
EB16 NEW	Promote biodiversity messages within appropriate education programmes	GWRC, PHT											
				EC3 ex-EC2	Design, build and install an estuary interpretation network, centre and/or kiosk	GWRC	P						
EB17 ex-EA17	Undertake regular surveys of estuary sediment communities and habitat	GWRC	P										RESEARCH
EB18 ex-EB19	Undertake annual intertidal survey	GWRC	P										
EB19 ex-EA20	Undertake regular estuary habitat mapping surveys	GWRC	P										
EB20 NEW	Undertake regular surveys of seagrass cover and condition	GWRC											
				EC4 ex-EB6	Undertake inter-tidal shellfish survey of Onepoto Arm	TROTR	P						
				EC5 NEW	Undertake sub-tidal shellfish survey of whole of Te Awarua-o-Porirua Harbour	TROTR	P						
				EC6 ex-EB16	Undertake three-yearly Shellfish Survey of whole Te Awarua-o-Porirua Harbour	GOPI, TROTR	P						
				EC7 NEW	Undertake experimental transplant trials of seagrass	GWRC							

OR BROAD-RANGING ACTIVITIES THAT INCLUDE THE RESTORATION OF ECOLOGICAL HEALTH, SEE PAGES 20-21

Action Plan for Activities that:

1. Reduce Rates of Sedimentation;
2. Reduce Pollutant Inputs; *and*
3. Restore Ecological Health.

These activities target all three key areas listed above.

The Vision, Current State, Targets and Issues and specifically focused activities in each of these areas can be found on the following pages:

- Reduction of Sedimentation– pages 14-15
- Reduction of Pollutant Inputs – pages 16-17
- Restoration of Ecological Health – pages 18-19

P = Priority project

LEAD ROLES: PCC – Porirua City Council; WCC – Wellington City Council; GWRC – Greater Wellington Regional Council; Joint – Collaboration between PCC, WCC and GWRC; GOPI – The Guardians of Pauatahanui Inlet; PICT – Pauatahanui Inlet Community Trust; PHT – Porirua Harbour Trust

COMPLETED ACTIVITIES – SINCE 2006

REGULATION

TA1 NEW	Established Te Awarua-o-Porirua Harbour and Catchment Joint Committee	PCC	
TA2 NEW	Established Te Awarua-o-Porirua Whaitua Committee	GWRC	
TA3 NEW	Completed draft Regional Plan	GWRC	P

PROJECTS

TA4 EX-SB5 (PART)	Completed a whole-of-catchment Te Awarua-o-Porirua Harbour and Catchment Sediment Reduction: Issues and Recommendations report	GWRC	
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EDUCATION

TA5 EX-PA16	Facilitated Low Impact Urban Design and Development workshops	WCC	
TA6 NEW	Produced Water Sensitive Urban Design Guide	WCC	P
TA7 EX-SA11	Established Te Awarua-o-Porirua Harbour and Catchment Community Trust	PCC	P

RESEARCH

TA8 EX-SA17	Established the Te Awarua-o-Porirua Harbour Science Advisory Group	GWRC	P
TA9 EX-SA18	Established biophysical baselines and environmental monitoring programme	GWRC	P

FOR ACTIVITIES THAT FOCUS ON SPECIFIC AREAS,

CURRENT AND ONGOING ACTIVITIES

TB1 EX-SB1	Issue and monitor compliance of resource consents	PCC, WCC, GWRC	
TB2 EX-SB2	Maintain and improve resource consent effectiveness	GWRC	
TB3 EX-SB1	Align planning documents with the Harbour and Catchment Strategy	GWRC, PCC, WCC	P
TB4 EX-PB1	Align Asset Management Plans with the Harbour and Catchment Strategy	GWRC, PCC, WCC	P
TB5 EX-PB4	Implement Asset Management Plans consistent with the Harbour Strategy	GWRC, PCC, WCC	P
TB6 NEW	Support and service Te Awarua-o-Porirua Harbour and Catchment Joint Committee	PCC	
TB7 NEW	Support and inform Te Awarua-o-Porirua Whaitua Committee	GWRC	
TB8 NEW	Support setting limits to meet catchment objectives through Te Awarua-o-Porirua Whaitua Committee	GWRC	P
TB9 EX-EB1	Align Asset Management Plans for Reserve Management with DOC Strategies	PCC, WCC, GWRC	
TB10 EX-SA3	Implement Reserves and Vegetation Policy	PCC	
TB11 NEW	Adopt and implement Water Sensitive Urban Design Guidelines	WCC	P

TB12 NEW	Complete Long-term Plans for 2015-25 to ensure provision for implementing Harbour Strategy	GWRC, PCC, WCC	P
TB13 EX-SA8	Coordinate inter-agency cooperation	PCC	P
TB14 EX-SA6	Implement Pauatahanui Vegetation Framework's re-vegetation programme	GWRC	P
TB15 NEW	Develop a reporting indicator framework for implementation of Harbour Strategy	PCC	P
TB16 EX-SB5	Completed a whole-of-catchment Te Awarua-o-Porirua Harbour and Catchment Sediment Reduction Plan	GWRC	P

TB17 EX-PB2	Review, enhance and implement building site guidelines	PCC, WCC	
TB18 EX-SA14	Facilitate public presentations and seminars	PCC	
TB19 EX-SA15	Produce environmental education materials	GWRC, PHT	
TB20 NEW	Resource and support school environmental educators	PHT, GWRC	P
TB21 EX-SB11 EX-PB9	Implement community environmental engagement and education programmes	GWRC	P
TB22 NEW	Undertake regular Community Environmental Perception Surveys	PCC	
TB23 EX-EA15	Promote sustainable farm and forest management.	GWRC	

TB24 EX-SA17	Maintain the Te Awarua-o-Porirua Harbour Science Advisory Group	GWRC	
TB25 EX-SA18	Develop and maintain environmental research and monitoring programmes	GWRC	
TB26 EX-SC5	Develop partnerships with tertiary and research institutes and other relevant organisations	GWRC, PCC	
TB27 EX-EA17	Undertake regular surveys of estuary sediment quality and benthic community health	GWRC	

IMMEDIATE TERM – NEXT 3 YEARS

TC1 NEW	Complete Regional Plan and appropriately reflect Harbour Strategy	GWRC	P
TC2 NEW	Undertake plan changes in the Regional Plan in accordance with approved recommendations of Te Awarua-o-Porirua Whaitua Committee	GWRC	P
TC3 NEW	Review District Plans to appropriately reflect Harbour Strategy	WCC, PCC	P
TC4 NEW	Implement non-regulatory methods identified through the Te Awarua-o-Porirua Whaitua Implementation Plan	GWRC, PCC, WCC	P

TC5 EX-SB4	Complete Rural Guidelines	PCC	P
TC6 EX-SB9	Support community environmental care programmes for priority locations	GWRC, WCC	
TC7 EX-SB12	Prepare, distribute & promote relevant commercial and industry guidelines	PCC	

MEDIUM TERM – 3-10 YEARS

TD1 EX-SB1	Maintain on-going programme of regulatory alignment, as appropriate	GWRC, PCC, WCC
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TD2 EX-SC4	Establish targeted industry partnerships	PCC, WCC
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TD3 NEW	Design and install State Highway signage at three entrances to the Te Awarua-o-Porirua Harbour catchment	PCC, Sponsor
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TD4 EX-SB11	Maintain on-going community and business engagement and environmental education programmes	GWRC
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TD5 EX-SC4	Continue establishing targeted industry partnerships	PCC, WCC, GWRC
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TD6 EX-SA18	Continue on-going research and monitoring programmes	GWRC
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REGULATION

PROJECTS

EDUCATION

RESEARCH

SEE: REDUCTION OF SEDIMENTATION (PAGES 14-15), REDUCTION OF POLLUTANT INPUTS (PAGES 16-17), RESTORATION OF ECOLOGICAL HEALTH (PAGES 18-19)

Monitoring, reporting and review

Monitoring progress against the Strategy will be by regular reporting to the Te Awarua-o-Porirua Harbour and Catchment Joint Committee, and by annual reporting against the Strategy's Action Plan by Porirua City Council, Wellington City Council and the Greater Wellington Regional Council. This active monitoring will ensure that areas needing more attention or improvement can be identified.

A network of environmental monitoring sites has been established in and around the harbour and catchment. These will provide information from

which progress in harbour health can be measured.

The set of indicators on page 11 will help the Harbour Committee, councils, other agencies and the community to measure progress in meeting Strategy objectives and targets. Progress will be reported through each council's Annual Plan.

The Strategy and Action Plan will be reviewed every three years in the light of implementation progress, scientific information, observation, 'best practice' development and public and agency consultation.

The next scheduled review of the Action Plan is in 2019, prior to the 2020 Long Term Planning round.

WHAITUA COMMITTEE

Greater Wellington Regional Council has recently established the Te Awarua-o-Porirua Whaitua Committee.

The Whaitua will work to collect and relay environmental, mana whenua, economic and technical information and community knowledge about the harbour, streams and catchment.

The Whaitua will then develop a specific chapter on Porirua Harbour for inclusion in the Regional Plan that will identify a range of prioritised regulatory and non-regulatory actions that will be reflected in future implementation plans.

The Whaitua process will provide statutory backing for elements of the Harbour Strategy and additional guidance towards improving harbour health.



What Te Awarua-o-Porirua Harbour will be like in the future

Sediments are no longer rapidly filling the harbour and smothering shellfish beds.

An improved flushing regime is achieved in the harbour.

The harbour and waterways are 'clean' and attractive. Pollutant levels in surface sediments are insignificant and water quality vastly improved. The community is satisfied with this level of improvement.

Human-sourced litter is minimised in and around the harbour edge.

It is safe to bathe and engage in other water contact activities throughout the harbour.

Significant areas of seagrass, saltmarsh and other estuarine vegetation are restored to the harbour and are providing enhanced habitat for fish, birds and other animal life.

Significant lengths of riparian (stream-bank) areas are planted and protected within the catchment.

Erosion-prone catchment headwaters are increasingly vegetated and contributing to improved ecology, water flows, and reductions in erosion and sediment run-off.

Improvement in the health of kaimoana resources.

The harbour is recognised, promoted and used as a significant natural, recreational and educational resource and attraction.

Harbour health forms a regular fundamental consideration in all council and agency decision-making on resource and infrastructure development and management.

Environmentally sustainable development is promoted, practiced and recognised.

Estuarine and aquatic ecosystems are healthy, functional and productive.

Harbour hard edges are renovated and are an attractive, widely-used asset to Porirua City, with the CBD recognising and reconnecting to the harbour.

Promotion of Porirua consistently reflects a harbour connection with pride.

At least 90% of Porirua City residents rate the environmental quality of Te Awarua-o-Porirua Harbour as high or very high.

Te Awarua-o-Porirua Harbour is used and enjoyed by an increasing proportion of the Wellington region's community.

The joint councils are recognised for innovative environmental management.

Things YOU can do now to help...

AT HOME

- Wash your car on the grass.
- Dispose of paint, solvents and other chemicals down the sink or onto grass.
- Dispose of your rubbish in proper places.
- Recycle used motor oil – take it to your local garage or tip.
- Paint galvanised roofing.
- Plant trees and shrubs.
- Join a local environment group, or a planting or clean-up day.

GENERAL

- Avoid putting chemicals and sediment into drains or the gutter. Street drainage goes untreated into streams and the harbour. Drains are a significant source of harbour pollutants.
- Consider painting any exposed galvanised roofs or using a pre-coated roofing material. Unpainted roofs are the major source of the ecotoxin zinc. Roof water drains to the stormwater system and into our streams and harbour.

AT WORK

- Develop a 'site management plan' to avoid polluted or sediment-laden run-off and litter issues.
- Avoid vehicle wash water going into drains.
- Paint galvanised roofing.
- Promote environmental awareness amongst staff or clients.

- Report any pollution or sediment incidents. If you observe or accidentally cause an incident, call the **24-Hour Environment Hotline 0800 496 734**. Greater Wellington Regional Council will respond. They have the authority to stop polluters and also have the expertise and equipment to assist with cleaning up pollutants.



Copies of the Strategy and supporting Detailed Action Plan supplement can be viewed or downloaded from:

www.pcc.govt.nz,
keyword: harbourstrategy

Or contact:

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Te Awarua-o-Porirua Harbour Strategy
Coordinator
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