Outcome:

Environment and Cultural Heritage

Aucklanders preserve, protect and care for the natural environment as our shared cultural heritage, for its intrinsic value and for the benefit of present and future generations.

DIRECTION	FOCUS AREA
Direction 1 Ensure Auckland's natural environment and cultural heritage is valued and cared for	**Focus Area 1** Encourage all Aucklanders to be stewards of the natural environment, and to make sustainable choices
Direction 2 Apply a Māori world view to treasure and protect our natural environment (taonga tuku iho)	**Focus Area 2** Focus on restoring environments as Auckland grows
Direction 3 Use growth and development to protect and enhance Auckland's natural environment	**Focus Area 3** Account fully for the past and future impacts of growth
Direction 4 Ensure Auckland's infrastructure is future-proofed	**Focus Area 4** Protect Auckland's significant natural environments and cultural heritage from further loss
	Focus Area 5 Adapt to a changing water future
	Focus Area 6 Use green infrastructure to deliver greater resilience, long-term cost savings and quality environmental outcomes

Environment and Cultural Heritage explained

The natural environment is the basis for our existence. It supports and enables all aspects of our society, economy and culture.

The natural environment is inextricably connected to Aucklanders' sense of identity and place. It affects our health and wellbeing through the mental and physical interactions we have with it, and it provides the clean air we breathe and fresh water we drink.

The natural environment

Auckland's natural environment not only supports its people, but it is home to many special local ecosystems and is essential for the survival of both indigenous wildlife and species from across the world.

For example, the Kaipara Harbour, the Firth of Thames and the Manukau Harbour provide feeding and breeding grounds for many coastal and migratory birds, including threatened species such as the wrybill, bar-tailed godwit and New Zealand dotterel.

Some native species are not found outside New Zealand and are under threat of extinction, such as:

- birds on islands in the Hauraki Gulf
- kauri in the Waitākere and Hunua forests
- unique species in our marine and freshwater environment.

Twelve of the 59 different types of New Zealand's indigenous forest ecosystems are found in Auckland. Harataonga Bay, Aotea / Great Barrier Island has Auckland's most diverse forested area.

We have a responsibility to ensure the natural environment is protected and cared for, both for its intrinsic value and to sustain life for future generations.

Our cultural heritage

The natural environment is part of Auckland's shared cultural heritage.

This term is often used to describe that which we have inherited from past generations and are looking after for the benefit of future generations.

In this plan, the term is used to mean our collective heritage of:

- air, land, and water
- biodiversity
- significant landscapes
- historic features.

The environment and our shared cultural heritage provide an anchor for the sense of belonging that communities have to their place. These connections are addressed in the Belonging and Participation outcome.

The quality of the natural environment means that Auckland has always been a desirable place to be.

It has allowed people to survive and thrive, and has given rise to other aspects of cultural heritage such as stories, art, and knowledge as well as the strong connection to sites, landscapes and structures of significance. Auckland's built heritage is, for example, an important connection for some Aucklanders. This link and the specific role of built heritage in shaping our homes, places and spaces is explored in the Homes and Places outcome.

The natural environment and our shared cultural heritage have enticed people to invest in Auckland over hundreds of years. They continue to attract migrants and are one reason why so many people call Auckland home.

Environmental protection

Preserving and managing Auckland's diverse natural environments and protecting their quality is a complex and vital responsibility for all Aucklanders.

It is particularly complex in the context of a growing population and the requirements of the commercial, agricultural, and industrial activities that form part of our economy.

Despite past efforts to protect and enhance the natural environment, it has been significantly stressed by the impacts of human activity.

It continues to be negatively affected by the:

- consequences of past decisions
- inability of infrastructure to cope with current pressures
- day-to-day lifestyle decisions people make.

We continue to see negative environmental consequences from historic land use and infrastructure decisions such as:

- combined wastewater and stormwater networks – which now overflow into our harbours
- the prioritisation of private over public transport, leading to more vehicle emissions and more road runoff
- developments through natural water courses and within flood plains which cause downstream impacts and require engineered solutions to manage increased water flows
- ineffective on-site waste water treatment in some areas.

Find out more by reading The Health of Auckland's Natural Environment in 2015 report.[164]

Doing better in the future

As Auckland grows we must do things differently. We have to achieve better environmental results through our decision-making.

There are also new problems to address.

Heat waves, droughts and tropical storms are part of our lives. However, the climate change impacts we are now beginning to experience are likely to worsen, and will have major long-term effects on how we live.

Other threats are becoming more common too. Our kauri are under threat from kauri dieback, and our marine environments are under pressure from pest species. We can also expect more frequent threats to biosecurity as the climate changes. Activities on land continue to impact our rivers and marine environments, through contaminants like sediment, heavy metals and nutrients. Waste and litter continue to impact our natural environment as well, particularly our streams and harbours.

We must take action to reduce and mitigate these threats and minimise the impacts on Auckland's people and cultural heritage.

Protecting, restoring and enhancing the natural environment is critical to ensuring our future.

How we track progress

We will track progress against a set of measures.

The measures for this outcome are:

- the state and quality of locally, regionally and nationally significant environments
- marine and fresh water quality
- air quality and greenhouse gas emissions
- protection of the environment
- resilience to natural threats
- treasuring the environment

Figure 29 - Ecosystem services. Source: WWF's Living Planet report 2016

Ensure Auckland's natural environment and cultural heritage is valued and cared for

The natural environment supports and sustains us in many different ways.

It plays a critical role in delivering social, cultural, economic and environmental outcomes for Aucklanders.

It provides us with opportunities to diversify and strengthen our economy in sectors like tourism, agriculture and horticulture and green technology innovation.

It is also part of Auckland's shared cultural heritage and provides an anchor for the sense of belonging that communities have to their place.

The natural environment and our shared cultural heritage are central to attracting the visitors, skills and investment that help to drive our prosperity.

However, many of our treasured natural environments, ecosystems, indigenous species, and sites of cultural significance are already under significant pressure from human activity, and some are in decline.

To reverse this decline, all Aucklanders must play their part in ensuring that the natural environment and cultural heritage is valued and cared for.

We must better understand and recognise the life-sustaining benefits the natural environment provides as well as the critical role it plays in shaping and sustaining Auckland's future.

We must actively seek opportunities to protect and enhance these values through our short and long-term decisions.

Find out more by reading The Health of Auckland's Natural Environment in 2015 report.[165]

Direction 2:

Apply a Māori world view to treasure and protect our natural environment (taonga tuku iho)

Te ao Māori concepts such as kaitiakitanga, rangatiratanga, whanaungatanga and manaakitanga offer Auckland an integrated approach to protecting and enhancing our treasured environments for ourselves, and for future generations.

Embedding these concepts into our thinking and decision-making supports a focus on the interrelationships between the natural environment and people.

Mana whenua have a unique relationship with the natural environment as kaitiaki.

They hold an enduring relationship with the land, marine and freshwater environments and have deep and valuable knowledge.

Their body of knowledge – both tangible and intangible – cultural practices and heritage are all linked to the whenua and its life.

Though te ao Māori in origin, these broader concepts, which acknowledge the interrelationship between the natural environment and people in how the world is viewed, can be adopted and practised by everyone.

Almost every environmental indicator is in steady decline.

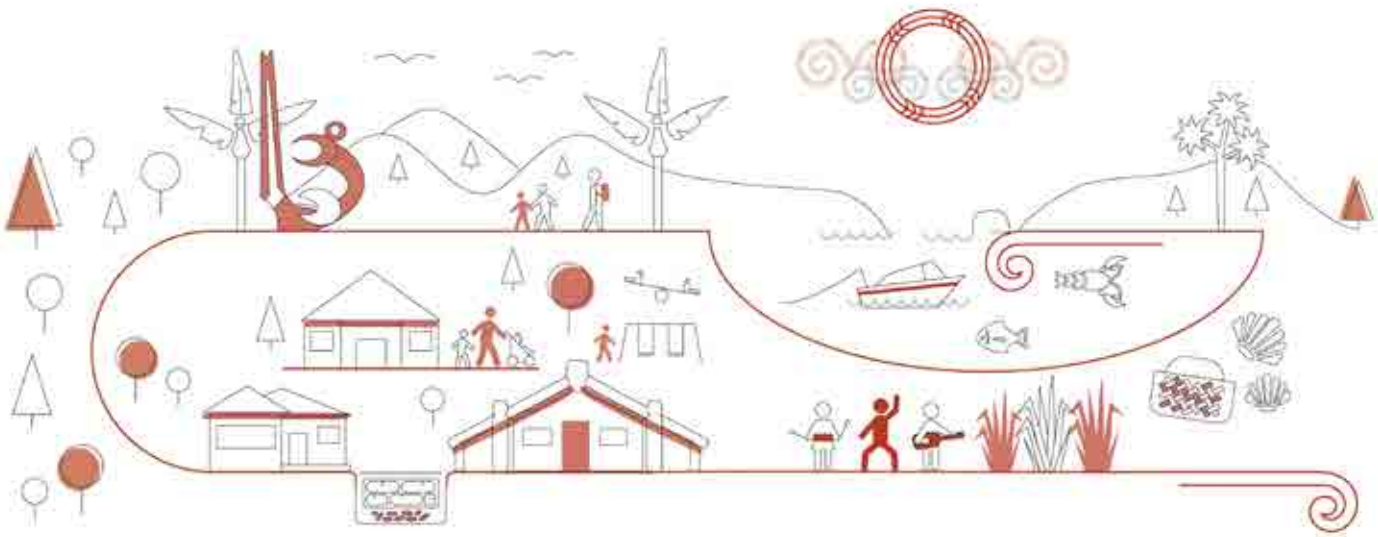
This means that current approaches and practices are not working.

We have to change our way of thinking about the natural environment and make the links between what we value and our own behaviours and decisions.

Adopting a Māori world view as an approach provides us with a viable alternative.

Integrating this knowledge into our behaviours and decisions is essential to successful and sustainable environmental management, and ensuring we protect and enhance the mauri of the natural environment.

For more information read the Māori identity and wellbeing outcome.



Use Auckland's growth and development to protect and enhance the natural environment

Continued population growth and urban development are likely to increase the severity and intensity of pressure on Auckland's already stressed environment.

However, with awareness and effort, and by doing things differently, future development can deliver significant environmental improvements.

Auckland must ensure that development is sustainable and has minimal negative impacts on the natural environment.

It can be done by embedding sustainable environmental practices in our buildings, infrastructure and places and spaces. For example:

- using resources efficiently and sustainably
- green infrastructure
- lowering emissions from transport and industry
- technological innovation in the construction and form of our buildings.

Auckland's future growth will bring greater levels of investment. Transport, stormwater and wastewater investments in particular will be some of the largest ever made in Auckland.

We can use these investments, and others, to not only perform their technical function but to protect or enhance the overall health of the environment and ecosystems.

As these investments have to be made to service growth, they provide ideal opportunities to make meaningful environmental gains.

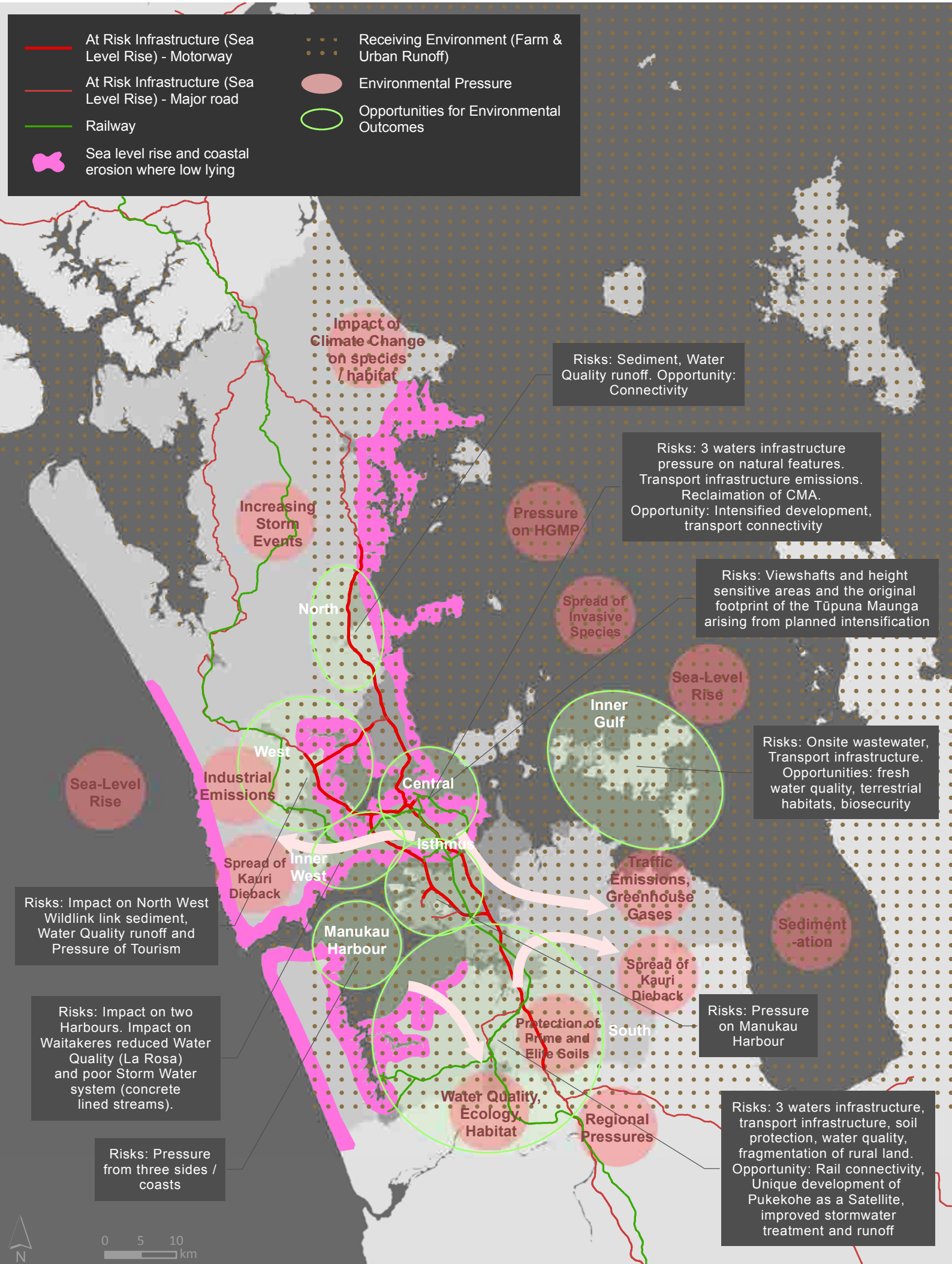
This requires different expectations or minimum bottom lines from these investments, starting from their initial conception through to execution.

We can also create buildings that minimise their impacts and maximise the experiences of their inhabitants through the use of green building principles.

Our buildings can be used to generate electricity, food, heat and water, reducing pressure on our already scarce resources.

By embedding more sustainable design principles in the planning, design, construction and operation of our buildings, Auckland can take a whole-of-life approach to protecting and enhancing the natural environment.

See Map 12 - Risks and opportunities for more information on the infrastructure at risk to environmental change, areas of evironmental pressures and opportunties


At Risk Infrastructure (Sea Level Rise) - Motorway
At Risk Infrastructure (Sea Level Rise) - Major road
Railway
Sea level rise and coastal erosion where low lying
Receiving Environment (Farm & Urban Runoff)
Environmental Pressure
Opportunities for Environmental Outcomes
Impact of Climate Change on species / habitat
Risks: Sediment, Water Quality runoff. Opportunity: Connectivity
Risks: 3 waters infrastructure pressure on natural features. Transport infrastructure emissions. Reclaimation of CMA. Opportunity: Intensified development, transport connectivity
Increasing Storm Events
Pressure on HGMP
Risks: Viewshafts and height sensitive areas and the original footprint of the Tūpuna Maunga arising from planned intensification
North
Spread of Invasive Species
Sea-Level Rise
Inner Gulf
West
Industrial Emissions
Central
Risks: Onsite wastewater, Transport infrastructure. Opportunities: fresh water quality, terrestrial habitats, biosecurity
Sea-Level Rise
Isthmus
Spread of Kauri Dieback
Inner West
Traffic Emissions, Greenhouse Gases
Risks: Impact on North West Wildlink link sediment, Water Quality runoff and Pressure of Tourism
Manukau Harbour
Sediment -ation
Spread of Kauri Dieback
Risks: Impact on two Harbours. Impact on Waitakeres reduced Water Quality (La Rosa) and poor Storm Water system (concrete lined streams).
Protection of Prime and Elite Soils
South
Risks: Pressure on Manukau Harbour
Water Quality, Ecology, Habitat
Regional Pressures
Risks: 3 waters infrastructure, transport infrastructure, soil protection, water quality, fragmentation of rural land. Opportunity: Rail connectivity, Unique development of Pukekohe as a Satellite, improved stormwater treatment and runoff
Risks: Pressure from three sides / coasts
N
0 5 10
km

Ensure Auckland's infrastructure is future-proofed

It is essential that Auckland's infrastructure can withstand short-term shocks, such as flooding. It also needs to work well in the long-term, particularly in the face of longer-term climatic changes. Transport infrastructure can have harmful environmental impacts such as runoff from roads which pollutes waterways. This is addressed under the Transport and Access outcome.

Climate change will put additional strain on our infrastructure. New infrastructure will need to recognise future pressures, and be resilient and adaptable.

Much of our infrastructure such as water supply, wastewater and stormwater networks, and power supply networks, is ageing and does not always meet modern requirements or expectations.

This can have negative impacts such as:

- poor water quality from ageing wastewater networks with insufficient capacity
- increased greenhouse gas emissions from fossil fuel-dependent transport
- reduced resilience to climate change.

New infrastructure involves significant time and investment. We have to start now to create the systems and services we want in the future.

This means that:

- we need to build flexibility and adaptability into infrastructure design to ensure it is easier to modify and respond to changing needs
- we must reduce and potentially eliminate the impacts of inefficient infrastructure through retrofits and upgrades and finding alternative ways to deliver core services.

New ways of delivering core services can range from decentralising power supplies to recycling wastewater and turning waste into resources.

We also need to consider bolder initiatives, such as retreating from some coastal areas and avoiding flood inundation zones[166] to ensure development is sustainable over the long-term.

Photograph of a stormwater improvement project from above

Encourage all Aucklanders to be stewards of the natural environment, and to make sustainable choices

Aucklanders interact with the natural environment each and every day.

Early Māori expressed their culture and whakapapa in the natural environment. This included the meaning and significance of cultural practices, physical landscapes and their waahi tapu.

This continues with all people of New Zealand.

In our own ways we all value and enjoy the natural environment. We must therefore all engage in its protection and conservation and act as stewards of the natural environment. It also means we have to ensure our many interactions with the natural environment are sustainable.

As the impacts of climate change become clearer, this will become more and more important.

See Map 11 Environmental Assets - an interactive version of the map is available at aucklandplan.govt.nz

How this can be done

This approach needs to be part of our daily decisions, whether we are acting as individuals or as businesses and industries. As our population grows, so does our shared responsibility to take care of the natural environment.

Our choices and behaviours have a direct impact on the natural environment, whether they are, for example:

- the choices we make about the food and other products that we consume and use
- how we travel to work or school
- the products we use to construct and maintain our buildings
- the way we manage manufacturing processes
- how we deal with waste, by reusing or recycling resources.
- choosing to buy and use fewer non-recyclable products.

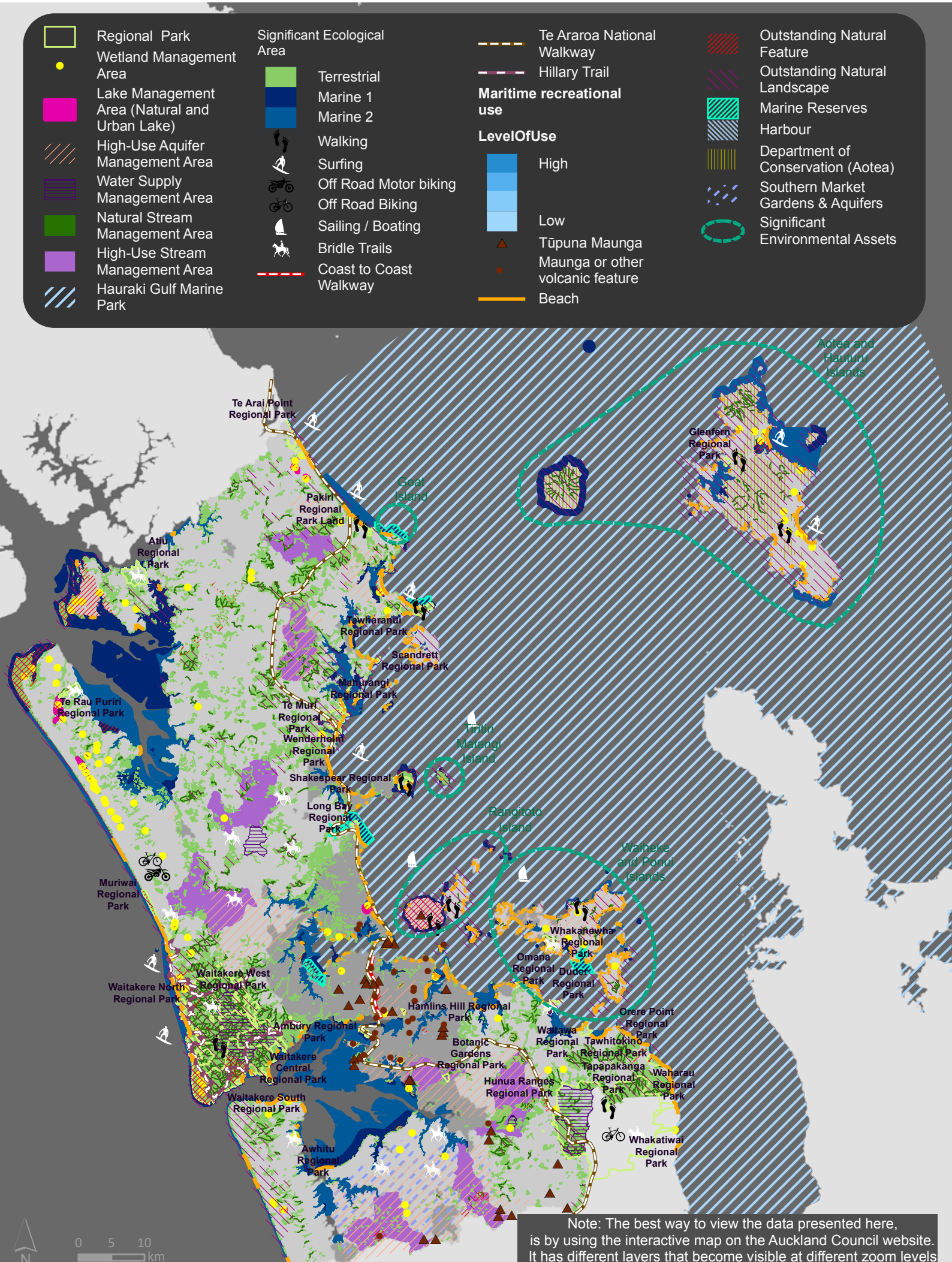
We all can, and must, shift from simply using and drawing on the natural environment to becoming active stewards of it.

Find out more about what you can do for the environment.[167]

See how we'll minimise and manage our waste.[168]





Note: The best way to view the data presented here, is by using the interactive map on the Auckland Council website. It has different layers that become visible at different zoom levels

Focus on restoring environments as Auckland grows

Auckland can use the processes of development and redevelopment to restore degraded ecosystems and places of cultural significance where appropriate. This is a key contributor to protecting and enhancing the environment.

Consistent population growth, and development to support this growth, has meant numerous areas and natural environments across Auckland have been degraded. Past activities or simple neglect has a lasting impact on the natural environment.

As growth and redevelopment happens in these areas opportunities arise to restore ecosystems and create new spaces for people to enjoy.

These opportunities need to be targeted, for example:

- remediate residual contamination - as described on the Ministry for the Environment website[169]
- enhance and restore existing ecological systems find out more at Auckland Growing Greener[170], Auckland Council's roles and commitments to deliver environmental outcomes for Auckland
- create new habitats for flora and fauna find out more about Auckland Council's Indigenous Biodiversity Strategy[171]
- identify local opportunities, like stream daylighting, revegetation, tree planting as part of development.

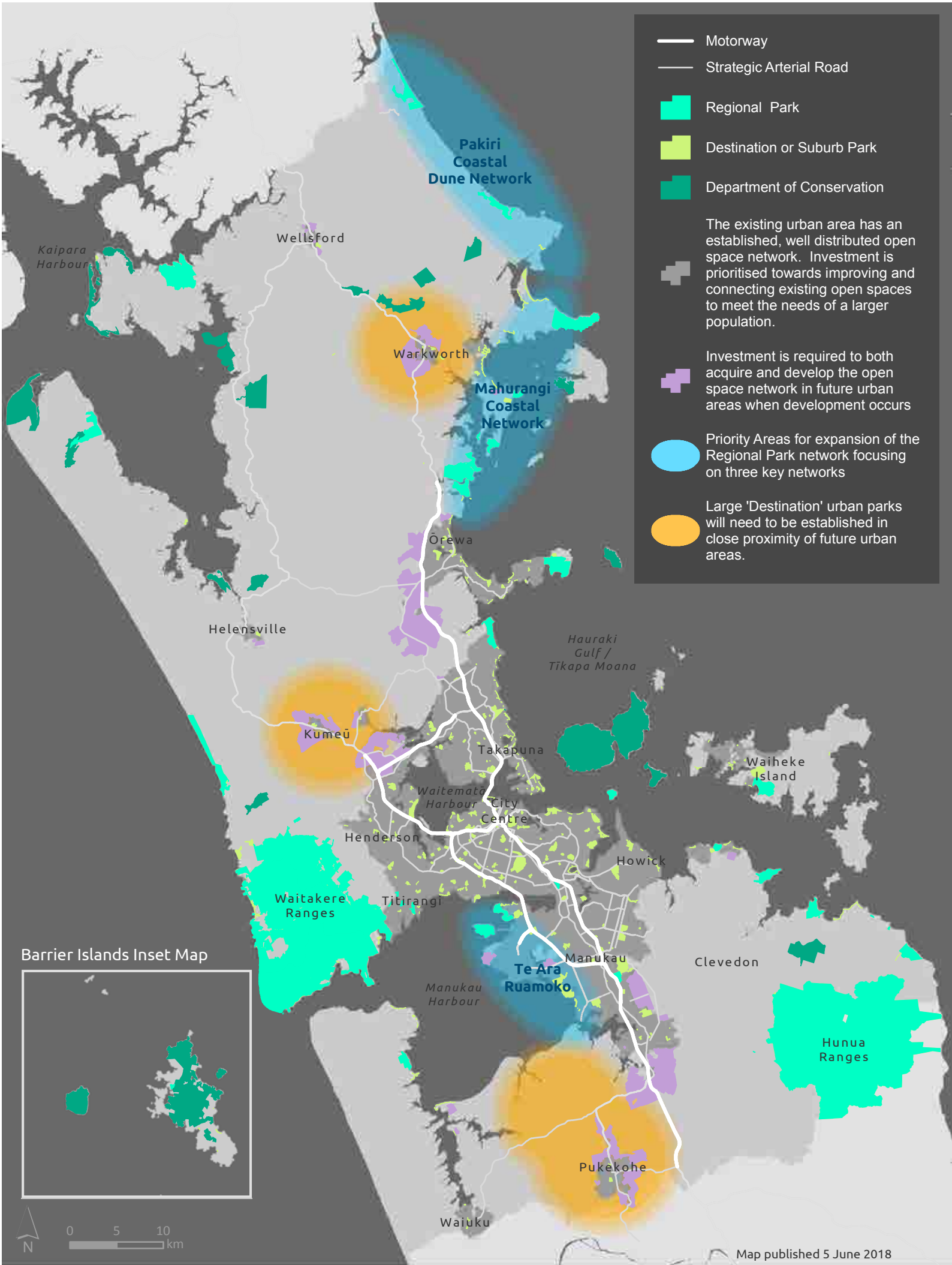
In turn, this can provide new natural environments for local communities to connect with and enjoy, further building and creating Auckland's shared cultural heritage.

See Map 13 - Open space

How this can be done

We can:

- better understand where and how our natural environments are degraded
- actively seek out opportunities to restore natural environments and ecosystems as growth and redevelopment happens
- set minimum expectations for new development and the contribution they have to make
- ensure the impacts and opportunities of our developments are integrated from the start, rather than having to invest further resource to fix up mistakes later.


Motorway
Strategic Arterial Road
Regional Park
Destination or Suburb Park
Department of Conservation
The existing urban area has an established, well distributed open space network. Investment is prioritised towards improving and connecting existing open spaces to meet the needs of a larger population.
Investment is required to both acquire and develop the open space network in future urban areas when development occurs
Priority Areas for expansion of the Regional Park network focusing on three key networks
Large 'Destination' urban parks will need to be established in close proximity of future urban areas.
Pakiri Coastal Dune Network
Mahurangi Coastal Network
Te Ara Ruamoko
Kaipara Harbour
Wellsford
Warkworth
Ōrewa
Helensville
Hauraki Gulf / Tīkapa Moana
Kumeū
Takapuna
Waiheke Island
Waitematā Harbour
City Centre
Henderson
Howick
Waitakere Ranges
Titirangi
Manukau
Clevedon
Manukau Harbour
Hunua Ranges
Pukekohe
Waiuku
Barrier Islands Inset Map
N
0 5 10 km
Map published 5 June 2018

Account fully for the past and future impacts of growth

Auckland must learn from the past, and embed more sustainable approaches in any future developments. Auckland's consistently growing population will continue to put pressure on the natural environment.

Decision-making needs to fully account for the immediate and ongoing impacts of population and urban growth and its related projects.

Developments do not exist in isolation. They have effects beyond the immediate and cumulative small impacts may combine to generate significant larger issues.

Depending on how it is managed, growth can also exacerbate threats such as climate change or the spread of invasive species.

For example, development in areas already susceptible to flooding increases the risk and intensity of flood events by generating higher volumes of run-off.

We need to reverse environmental decline as well as eliminate ongoing impacts. We also need to avoid short term solutions that create long-term costs and consequences.

How this can be done

More sustainable practices could include:

- assessing future threats and integrating how we deal with them into the design of developments, for example by ensuring resilience to climate change impacts
- minimising greenhouse gas emissions from all phases of development, from construction and use through to deconstruction and disposal Find out more about Low Carbon Auckland[172]
- maximising the flexibility and adaptability of developments, both in terms of form and of function, for example by creating public open spaces that also assist with flood management, as described on De Urbanisten website[173]
- requiring an assessment of the long-term environmental, social and economic impacts of all developments and verifying these impacts post-construction.

Much of this is in the hands of decision-makers who set legislation, policy and regulation for growth and development in Auckland.

They must use the experiences of the past as well as new knowledge and research to account for the long-lasting effects of growth decisions.

This will contribute significantly to making more sustainable choices now.

Protect Auckland's significant natural environments and cultural heritage from further loss

Auckland is home to a number of diverse and unique natural environments that are significant both in New Zealand and internationally.

Find out more about protecting Auckland's marine environments later in this section.

Our marine environments, for example, provide unique habitats for species and places for Aucklanders to enjoy.

Many of these environments are threatened by how they are currently treated and, unless we actively protect them, are likely to decline further as Auckland's population grows.

Unique cultural sites, landscapes and sites of significance to Māori must be protected from the pressures of growth as well as other emerging threats and risks.

These sites and landscapes include the:

- extensive archaeological landscapes of Āwhitu Peninsula
- the Tūpuna Maunga and other Auckland Isthmus volcanic cones
- Ōtuataua stone fields
- Franklin volcanic fields.

See Map 14 - Historic Heritage

How this can be done

Corridors such as the North-West Wildlink[174] create safe, connected and healthy habitats for native wildlife.

They must be recognised for their important role in providing interlinked spaces across Auckland where wildlife can breed safely and move between conservation hotspots. More links like this can be created.

Auckland's network of public spaces and parks also support conservation of habitats and species, while providing recreational and tourism opportunities.

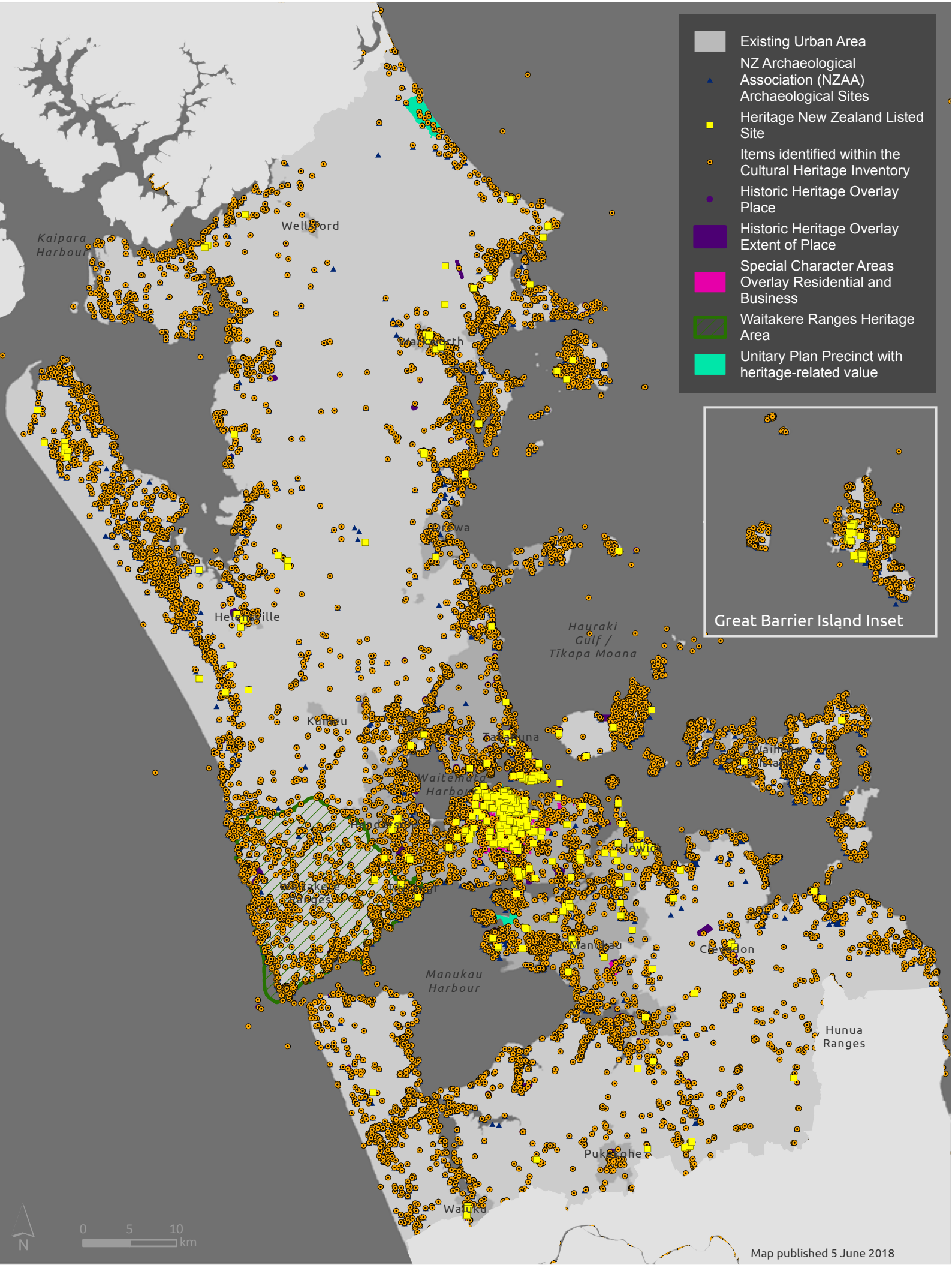
As Auckland grows, additional pressure will be put on these spaces, and additional spaces will be needed.

Some of Auckland's cultural heritage sites, cultural landscapes and sites of significance to Māori are also under pressure from development, either directly or from incompatible uses or activities close by. The Tūpuna Maunga, in particular, are vulnerable to new development compromising people's enjoyment of them, and their long-term protection.

There needs to be greater awareness of, and more investment made into ensuring the long-term protection and integrity of our cultural heritage sites, cultural landscapes and sites of significance to Māori.

We must also take care to safeguard against loss of habitat and sites of cultural heritage in areas that are currently flourishing and protected.

Maungakiekie / One Tree Hill. Photograph credit - Tūpuna Maunga Authority



Map published 5 June 2018

Adapt to a changing water future

Auckland is surrounded by rich marine and freshwater environments.

They provide:

- clean drinking water
- opportunities for recreation
- habitat for diverse species
- flood resilience and natural treatment of run-off
- economic development through tourism.

Water quality and quantity are both significant issues that will escalate as the population grows and the impacts of climate change become increasingly apparent.

We must do things differently if we are to ensure wildlife, people, and rural and urban businesses have adequate clean water supplies.

In both urban and rural areas, water quality has declined and freshwater environments have been compromised. They are showing the stress of decades of pressure – which will continue to increase if we do not change what we do.

The reduction of water quality has also affected the marine environment. This has resulted in poor ecological and amenity outcomes and, in some areas, beaches where it is unsafe to swim due to wastewater overflows.

More extreme weather events, as a result of climate change, mean that at times there will be too much water in some places. That is, parts of Auckland may experience flooding and coastal inundation.

At other times there may not be enough water and we will become increasingly reliant on the resources of neighbouring regions – who will be facing the same problems.

How this can be done

Auckland needs to proactively adapt to this changing water future and develop long-term solutions.

We can:

- start working towards solutions for meeting Auckland's long-term drinking water requirements. This may include finding alternative supplies and will require reducing consumption
- minimise our negative effects on water quality and quantity, in both freshwater and marine environments
- actively work to improve swimmability across the region
- maintain and improve water quality in freshwater environments
- improve our ability to manage and respond to the water-related impacts of climate change such as flooding and droughts
- consider the impacts of a changing water future on the industries and activities that rely on water, such as agriculture, power generation and food processing.

Focus area 6:

Use green infrastructure to deliver greater resilience, long-term cost savings and quality environmental outcomes

Infrastructure is a large part of any urbanised land. Using green infrastructure means replacing or supplementing traditional built infrastructure with natural and semi-natural systems.

For example, restored wetlands and roadside raingardens can be used to purify water, as well as minimise floods and erosion.

Increasing our urban forest by planting more trees can:

- reduce the urban heat island effect
- deliver enhanced air quality
- enhance people's mental and physical wellbeing.

These natural systems are often able to perform more effectively and efficiently than traditional 'hard' infrastructure solutions. They also provide opportunities to improve degraded natural environments, improve local amenity and enhance long-term environmental resilience.

As well as these benefits, the overall cost of green infrastructure can also be a fraction of constructed infrastructure solutions, due to lower ongoing maintenance costs.

These approaches help us to minimise the impacts of climate change, by improving our resilience and allowing infrastructure to adapt to change.

How this can be done

To realise the opportunities that green infrastructure can provide, we can:

- ensure our decision-making gives sufficient consideration and weight to the value of the natural environment and its role in delivering outcomes
- identify green infrastructure opportunities at the early stages of any development. This is important to ensure existing natural systems are enhanced rather than replaced, and to maximise the integration of other functions, such as public amenity and active transport opportunities
- engage with local communities to provide the strong sense of collective ownership that supports long-term usefulness.

Implementing the Environment and Cultural Heritage outcome

Implementation partners

Mana whenua, Auckland Council, central government, and community organisations are key partners in the ongoing protection and enhancement of Auckland's Environment and Cultural Heritage.

As kaitiaki, mana whenua have the responsibility of ensuring that the spiritual and cultural aspects of resources are maintained for future generations. This involves the ongoing protection of mauri from damage, destruction or modification.

Central government has several important functions. The Ministry for the Environment (MfE) has multiple implementation functions arising from a range of legislation including the Resource Management Act, Climate Change Response Act, and Environmental Reporting Act. MfE contributes to Auckland's environmental well-being through the following activities:

- provision of environmental management laws, regulations and national environmental standards
- national direction through national policy statements and strategies
- guidance and training on best practice
- information about the health of the environment.

In addition, central government is also involved in day-to-day environmental management activities in Auckland through the Department of Conservation's operational work programmes.

Auckland Council has several policy and regulatory levers, undertakes waste management and waste minimisation programmes, education and monitoring, and funding of grants for environmental enhancement.

Transport is a key contributor to the health of Auckland's environment. As Auckland Transport and the New Zealand Transport Agency make improvements to Auckland's transport system, there is an opportunity to deliver more sustainable options like low-emission vehicles, improved public transport frequency and green infrastructure approaches.

Wastewater and stormwater infrastructure play an important role in improving the quality of the environment. Watercare is a significant partner in ensuring Auckland's wastewater goals are met.

Non-governmental and community organisations involved in sustainability and environmental projects are important partners in delivering on-the-ground, local projects, such as working with businesses on sustainable practices, restoration planting and stream and beach clean-ups.

Individuals, businesses and developers can support the uptake of green technologies, like solar energy and better building technologies.

Auckland Council will develop an implementation approach for this outcome working alongside our key partners and stakeholders. This will be built on existing programmes and ensure all new elements introduced in the Auckland Plan 2050 are planned for.

Mechanisms used to work together

The Auckland Unitary Plan and structure planning process provide a framework and method for delivering positive environmental outcomes.

Environmentally sensitive approaches such as water-sensitive design, quality urban design and future-proofed infrastructure can be embedded in developments from the start, rather than retrofitting later or doing expensive restoration projects.

Collaboration between agencies, and the development of region-wide strategic approaches, can be achieved through fora such as the mana whenua Kaitiaki Forum, Hauraki Gulf Forum, and the Land and Water Forum.

Supporting strategies and plans

Auckland Growing Greener

Auckland Growing Greener[175] prepared by Auckland Council, is an ongoing initiative to restore and protect the environment while providing for the vitality and energy that a growing population brings. It has been developed in consultation with mana whenua, and anticipates a partnership model to develop and deliver identified commitments.

Low Carbon Auckland

Low Carbon Auckland[176] prepared by Auckland Council, together with key industries and partners, is a strategy for transitioning Auckland to a liveable, low carbon future.

Indigenous Biodiversity Strategy

The Indigenous Biodiversity Strategy[177] provides a framework for protecting and enhancing biodiversity, delivering on Auckland Council's statutory responsibilities.

Waste Management and Minimisation Plan

The Waste Management and Minimisation Plan[178] supports reducing waste, reusing and recycling more to achieve a zero waste goal by 2040.

Tūpuna Maunga Integrated Management Plan

The Tūpuna Maunga Integrated Management Plan[179] is a single integrated management plan to set the direction for maunga restoration, protection and management.

Asset Management Plans

- Auckland Council's Stormwater Asset Management Plan[180] determines how stormwater is managed, and supports the use of green infrastructure and minimisation of contaminants making it into the environment.
- The Watercare Asset Management Plan[181] plays a critical role in setting the framework for a safe and resilient Auckland water supply.
- The Open Space Strategic Asset Management Plan[182] recognises that as the city grows, there will be increasing demands on our parks and open space networks.

Hauraki Gulf Marine Spatial Plan

The Hauraki Gulf, known by many as Tikapa Moana and by others as Te Moananui ā Toi, is rightly recognised as a national taonga. Sea Change – Tai Timu Tai Pari[183] is a marine spatial plan designed to safeguard this treasure.

Auckland Council's strategies, policies and plans have acted as an important input in the development of Auckland Plan 2050. With the adoption of the plan, the council will assess these documents to ensure they remain fit for purpose.

How to get involved

- Get involved with community environmental projects[184] co-ordinated by Auckland Council
- Find out about options to manage your waste[185]
- See what you can do for the environment[186] or find out how you can get involved with. freshwater projects[187]
- See how you can choose plants to support ecosystems[188]
- For businesses, get involved with organisations like the Sustainable Business Network[189] and Sustainable Business Council[190]

Supporting information

State of Environment Reporting[191] measures the quality of the environment using long-term Auckland-wide datasets covering air quality, marine, freshwater and terrestrial environments.

Auckland Council's assessment of potential impacts of different growth scenarios on Auckland's natural environment (2017) can be found on the Knowledge Auckland website.[192]

The Hauraki Gulf Forum[193] publishes an independent State of the Gulf report every three years.

Ministry for the Environment's long-term environmental goals[194]

For more information on the role, purpose, implementation activities and monitoring and reporting of Ministry for the Environment in relation to air, climate change, freshwater, marine environments, land, waste or the Resource Management Act go to the Ministry for the Environment website.[195]

Find out more about the Environmental Protection Authority.[196]

Supporting information

Green Infrastructure

Our cultural heritage

Climate change

Ridge to Reef: Auckland's marine environments and their relationship to the land

Green infrastructure

What is green infrastructure?

Green infrastructure can have many forms, such as:

- a widened and replanted stream bank that helps to manage floodwater
- a permeable paved path that reduces the amount of stormwater entering the piped system
- a row of street trees or a whole urban forest
- a green roof or vertical wall
- a rain garden or an urban farm.

Broadly, the term refers to any system that fuses natural and built environments to reduce the environmental impact of core infrastructure and the built environment.

Further information on green infrastructure is available at:

United States Environmental Protection Agency website[197]

ESRI Living Atlas of the World website[198]

Examples of green infrastructure

Green roof and swale at the Auckland Botanic Gardens

The Auckland Botanic Gardens has planted native plants on the roof of its public toilet facilities, that absorb and treat rainwater.

This 'living roof' is combined with a vegetated swale - an area designed to manage water runoff - which further slows down and filters the flow of water, delivering relatively clean water to lakes in the gardens.

The swale works by increasing the time available for large sediment particles and contaminants to settle and be absorbed by the soils and plants.

Read more on the Auckland Botanic Gardens website.[199]

Natural stormwater solution, Te Auaunga Awa/ Oakley Creek

Significant flooding issues affected a 1.3 kilometre section of Te Auaunga Awa/Oakley Creek[200] in Mt Roskill and Mt Albert. To overcome these issues, Auckland Council replaced the existing concrete channel with a wider, naturalised stream channel.

The use of natural plants – native trees, ferns and flaxes – increased the water-carrying capacity of the watercourse and provided greater potential for stormwater to naturally soak into the ground.

This had several effects:

- reduced the effects of flooding on surrounding areas
- provided natural filtration and cleaning of collected stormwater
- reduced the pressure on stormwater systems further downstream.

The landscaping and planting was designed to support the rehabilitation and restoration of native ecosystems in the area. It also established an accessible river park for the local communities.

Green roof and swale at the Auckland Botanic Gardens

By using a natural stormwater solution with greater and more flexible carrying capacity, the potential for climate change and population growth to increase the rate and intensity of flooding events was also alleviated.

The project involved:

- increasing the stream capacity by removing the existing concrete channel and providing a wider naturalised stream channel
- rehabilitating of Te Auaunga Awa / Oakley Creek through landscaping, planting and water quality improvement
- replacing Beagle Ave and Richardson Road culverts with new bridges to improve stormwater capacity
- constructing two new pedestrian bridges across the stream
- upgrading the park, including new paths and cycleways, an outdoor classroom and adventure playground and traditional Māori play elements.

Urban forests

Green infrastructure is often thought of as specific and isolated things, such as a green roof, or a rain garden. However, bigger systems can also support green infrastructure objectives.

For example, urban forest initiatives that focus on increasing the overall tree canopy cover of cities also deliver a range of benefits to the environment and local communities. Increasing the tree canopy can reduce the urban heat island effect, deliver better air quality and improve residents' mental and physical wellbeing.

The Auckland Mayor's Million Trees Programme[201] aims to plant a million trees across Auckland over a three year period.

Auckland Council is also currently developing an Urban Forest Strategy that seeks to:

- green urban Auckland
- offset carbon emissions
- protect water quality by planting along rivers and coastlines
- improve our living environment.

Our cultural heritage

What is cultural heritage?

Cultural heritage is the term used to describe the ways of living developed by a community and passed on from generation to generation.

These include:

- customs
- practices
- places
- objects
- artistic expressions
- values.

It is also the legacy of knowledge, things and intangible attributes of a group or society passed from generation to generation. Cultural heritage includes:

- tangible culture such as buildings, monuments, landscapes, books, works of art, and artifacts
- intangible culture such as folklore, traditions, language, and knowledge
- natural heritage including culturally significant landscapes and biodiversity.

Auckland's cultural heritage

Auckland's cultural heritage is rich and diverse and includes Māori and non-Māori heritage.

It includes the Auckland War Memorial Museum/Tāmaki Paenga Hira and the Auckland Domain/Pukekawa.

It encompasses the extensive archaeological landscapes of

- Āwhitu Peninsula
- the Tūpuna Maunga and other Auckland Isthmus maunga
- Ōtuataua stone fields
- Franklin volcanic fields.

It includes post-war architecture such as the Group Architect houses, engineering feats such as the Grafton Bridge, and our Victorian and Edwardian buildings.

Our cultural heritage places comprise sites, features, areas, townscapes, streetscapes, landscapes, settlements, and other historical places.

Why is our cultural heritage important?

Many Aucklanders are passionate about our cultural heritage.

Our cultural heritage adds to the richness of our lives by reinforcing our sense of history and identity, and helps define what is distinctive about Auckland.

It enriches our environment, provides authenticity to our spaces, and continuity in our communities. Our cultural heritage is a source of pride.

Cultural heritage is of fundamental importance to tangata whenua, their culture and traditions.

How is cultural heritage addressed in the plan?

Cultural heritage is addressed in a number of parts of the Auckland Plan 2050.

Recognising the value of our cultural heritage and the importance of its protection is a core component of the Environment and Cultural Heritage outcome.

The key role that our shared cultural heritage plays in building cohesive and connected communities is addressed in the Belonging and Participation outcome. The specific role of built heritage in shaping our homes, places and spaces is addressed in the Homes and Places outcome.

How is cultural heritage managed?

Managing heritage comprises three key phases:

Understanding and sharing:

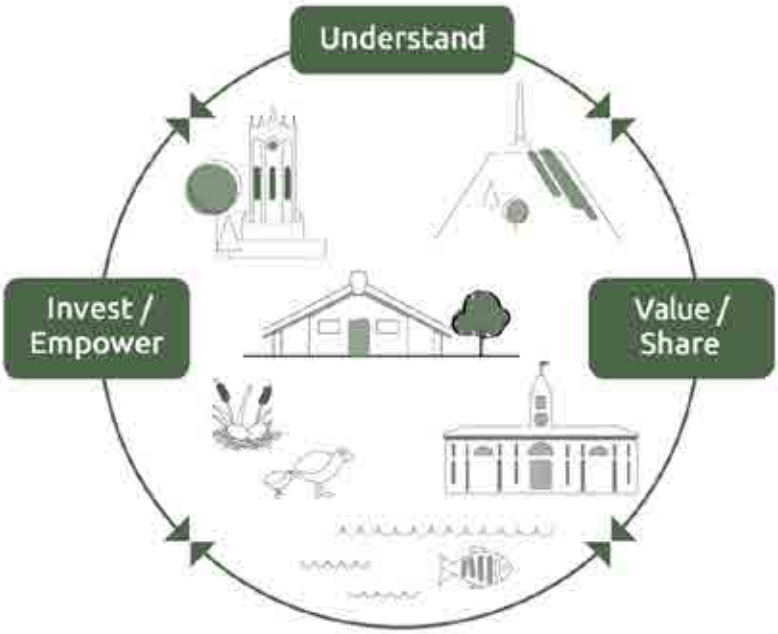
- providing a robust information base
- identifying, protecting and conserving our significant places – locally, regionally, nationally, and internationally
- encouraging greater understanding and enjoyment.

Investing:

- informing development, investment, and regeneration
- inspiring high quality and responsive design
- recognising and reinforcing the contribution to the character, quality, authenticity, and sustainability of our homes and places
- promoting economic development, including through appropriate use of existing heritage places.

Empowering collective stewardship:

- empowering the community and tangata whenua in active kaitiakitanga.



Climate change

Overview

Auckland faces climate-related risks such as heat waves, droughts and tropical storms.

The climate is constantly changing as a result of natural processes, and there is strong scientific consensus that greenhouse gas emissions (GHG), particularly from the use of fossil fuels, are causing the climate to change at unprecedented rates.

While the effects of climate change will become more severe and pronounced, local and global records for rainfall and temperature are already being broken on a regular basis.

How we address the implications of climate change will affect Auckland and Aucklanders for decades to come.

We must:

- tackle climate change by making significant reductions in global GHG emissions and moving to a low carbon economy
- develop ways to protect and increase our ability to withstand and recover from the adverse effects of a changing climate.

Mitigating and adapting to climate change is a challenge.

It means doing things that will have wider positive effects, such as reducing the environmental impact of transport, creating more green space, planting more street trees, and having cheaper and more reliable electricity and water.

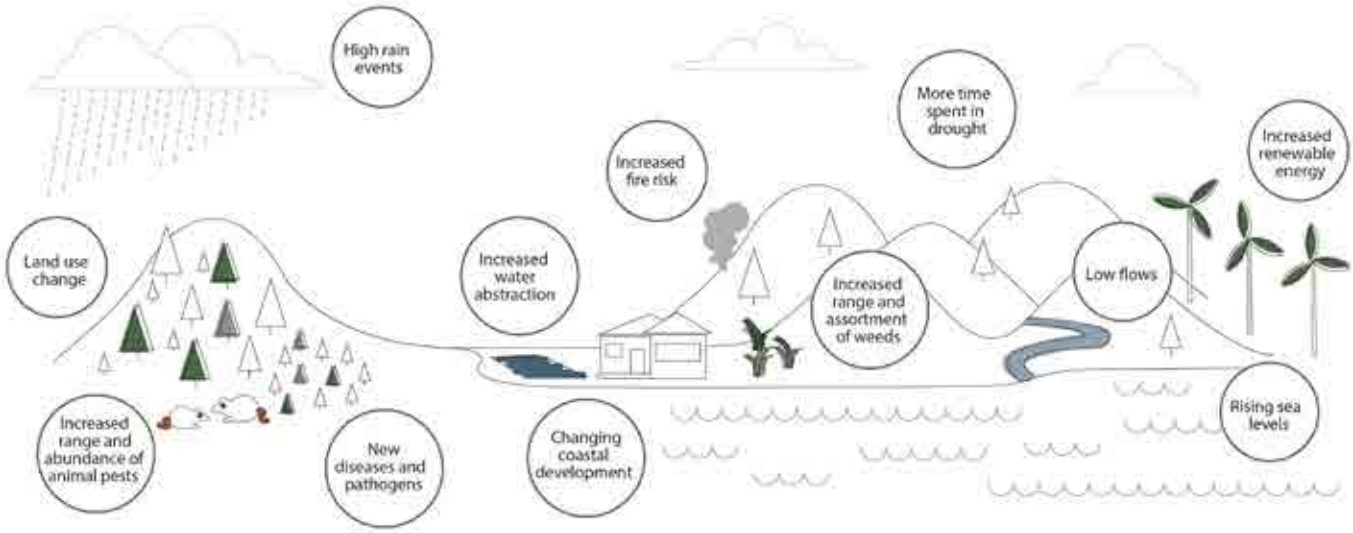
Auckland needs to be committed to a low emissions and a low carbon future to realise long-term economic, social and environmental benefits. This requires multi-sector collaboration.

Key climate-related risks for Auckland include:

- our natural and human made systems won't work as well as a result of changing climate conditions or damaging extreme events
- direct impacts on biodiversity, cultural heritage, productivity or changes in market demands for goods and services
- unequal distribution of impacts, with those such as the elderly, the very young, those living in poverty or with chronic health issues more likely to be negatively affected.

Key climate-related opportunities for Auckland include:

- innovation and savings through the transition to a low carbon economy but also significant risks to our competitiveness if we are left behind
- significant cost savings from embedding long-term climate change considerations into planning decisions
- significant cost-savings from reducing the need for major retrofitting or land-use changes as impacts become more frequent and severe.



The international context

Increasingly stringent international climate change policy affects New Zealand, and may reduce our ability to sell products and services in important economic sectors and export industries including tourism and agriculture.

For example, there is a risk that rising climate change awareness could undermine the willingness of people overseas to buy New Zealand produce, due to issues such as an increase in conscious consumerism, awareness of water quality impacts of dairying as well as concerns around 'food miles'. It may also reduce the viability of New Zealand as a tourist destination.

New Zealand and Auckland policy frameworks

New Zealand is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement and has committed to reduce GHG emissions by 30 per cent below 2005 levels by 2030. Read more on the Ministry for the Environment website.[202]

Auckland became a member of the C40 Cities Climate Leadership Group in 2015, a strategic global network of over 90 cities working together to reduce GHG emissions and climate risks. Find out more on the C40 Cities website.[203]

Research and analysis by the C40 Group has identified the upper limit of carbon that cities can emit if the temperature rise scenarios in the Paris Agreement are to be achieved. This 'carbon budget' was divided amongst member cities.

For Auckland this means we must dramatically increase action to reduce emissions. Our current emissions, while starting to decrease in per capita terms, are still increasing overall along with that of New Zealand as a whole, demonstrating the need for a step up in ambition.

Auckland Council's energy resilience and low carbon action plan, Low Carbon Auckland[204] sets a target for Auckland to achieve a 40 per cent reduction in GHG emissions by 2040 (based on 1990 levels).

Urgency

The projected long-term effects of climate change are that they will become more severe.

However, the immediate effects already pose significant risks and opportunities. Find out more about Auckland region climate change projections and impacts.[205]

The scientific and economic consensus, notably the Stern Review into The Economics of Climate Change[206], and research by the World Bank and by the New Zealand Treasury, show that the longer we delay reducing emissions, the more expensive and difficult it will become.

How Auckland can respond to climate change

Auckland's urban areas

In 2011 the United Nations estimated that cities account for 70 per cent of global GHG emissions. They are also strongly affected by climate change. Read more on the ZDNet website.[207]

Over 90 per cent of all urban areas are coastal, putting most of them at risk of flooding from rising sea levels and powerful storms. In response, cities around the world are leading the way in moving to a low-carbon future.

While Auckland's membership of the C40 Group supports actions in our urban area, we also need to be conscious of the role of our rural areas in combatting climate change.

Auckland's rural areas

Only six per cent of Auckland's GHG emissions come from agriculture. However, transforming forestry, agriculture and natural carbon assets are key opportunities to enhance Auckland's resilience to climate change and reduce our GHG emissions.

Opportunities include:

- growing the extent of our urban and regional forests
- turning forest and organic residues into energy
- enhancing local food production
- exploring the potential for coastal and marine areas to trap carbon.

Auckland Council's role

Auckland Council is committed to working with central government, business and local communities to ensure we are ready to deal with the risks, uncertainties and opportunities associated with critical climate change and energy issues.

Auckland Council has reduced energy, waste production and water use through its own operations, resulting in between $1.5 to $2 million annual savings.

For further information on Auckland Council's organisational GHG emissions reduction, see the Low Carbon Auckland updates[208] on the council website.

Inventory of Auckland's GHG emissions

Auckland Council has been monitoring and reporting on Auckland's GHG emissions through Low Carbon Auckland.[209]

The inventory provides guidance on Auckland's low carbon action investment priorities and tracks progress against our emissions reduction targets.

The emissions inventory shows that the vast majority of Auckland's GHG emissions arise from:

- transport
- burning fossil fuels for electricity generation and for other uses like domestic heating - so-called 'stationary energy' sources.

New Zealand already produces about 80 per cent of its electricity from renewable resources. We will need to maintain that percentage, at the very least, as our population grows and energy demands increase. Otherwise we will become increasingly reliant on imported fossil fuel supplies, and vulnerable to increases in the cost of energy.

Adapting to a changing climate

Adapting to a changing climate requires flexibility and adaptability in all our decisions.

For example, future development of land will need to be located away from coastal and low-lying areas vulnerable to sea-level rise, flooding and coastal erosion.

The risk and opportunities map shows the areas of land that may be affected by sea-level rise in the future

We may also need to design our buildings and infrastructure differently.

Other opportunities to embed climate change resilience include the use of green infrastructure and adapting to a changing water future.

Because of transport's contribution to GHG emissions, transforming how we travel is one of the key mechanisms to reduce the overall carbon footprint.

In addition, improving energy efficiency and accelerating the shift to renewable energy resources will help to address the stationary energy component of Auckland's emissions profile.

Whatever measures we take to reduce GHG emissions, some impacts are unavoidable due to emissions already in the atmosphere.

We therefore need to prepare, build understanding and increase resilience across our environment, economy and communities.

As the effects of climate change are still uncertain and subject to change over time, it will be necessary to monitor climate change impacts and projections and to gather local environmental data.

This will enable us to identify the most appropriate climate change responses in relation to the risks, costs and benefits involved, and to adapt plans as more information becomes available.

Low carbon economy

Evidence and economic modelling indicate that shifting to a low carbon economy – an economy which reduces the causes and effects of climate change – has numerous benefits.

There are many short-term challenges associated with this shift, yet it also has the potential to deliver long-term, resilient economic growth and increased productivity.

Many components of a low carbon economy – more sustainable and active transport choices, cleaner energy, greater public green space provision, and a higher-quality and safer built environment – also deliver improved economic and social wellbeing outcomes.

A low carbon economy reduces energy insecurity and potential increases in the cost of power. This is particularly important since many low-income families spend a disproportionate percentage of income on energy.

There are also well-documented air quality and health costs associated with the burning of fossil fuels.

What the shift to a low carbon economy means for jobs is not certain.

Some sectors may see job losses and affected workers may need training and new skills. Some new industries will be created. Others will survive and do better.

Overall, the investment in more resilient infrastructure is almost certain to drive both job creation and growth in our gross domestic product as well as stimulate growth and innovation throughout the economy.

Circular economy

The concept of a circular economy is one that focuses on restoring and recapturing value within a product's lifecycle.

A circular economy finds new ways to reduce waste. It places more emphasis on building linkages between businesses delivering better outcomes for people and planet as well as profit for businesses.

A circular economy can also be defined partly by what it is not – it's not an inefficient and wasteful linear economy that simply extracts, consumes, and disposes.

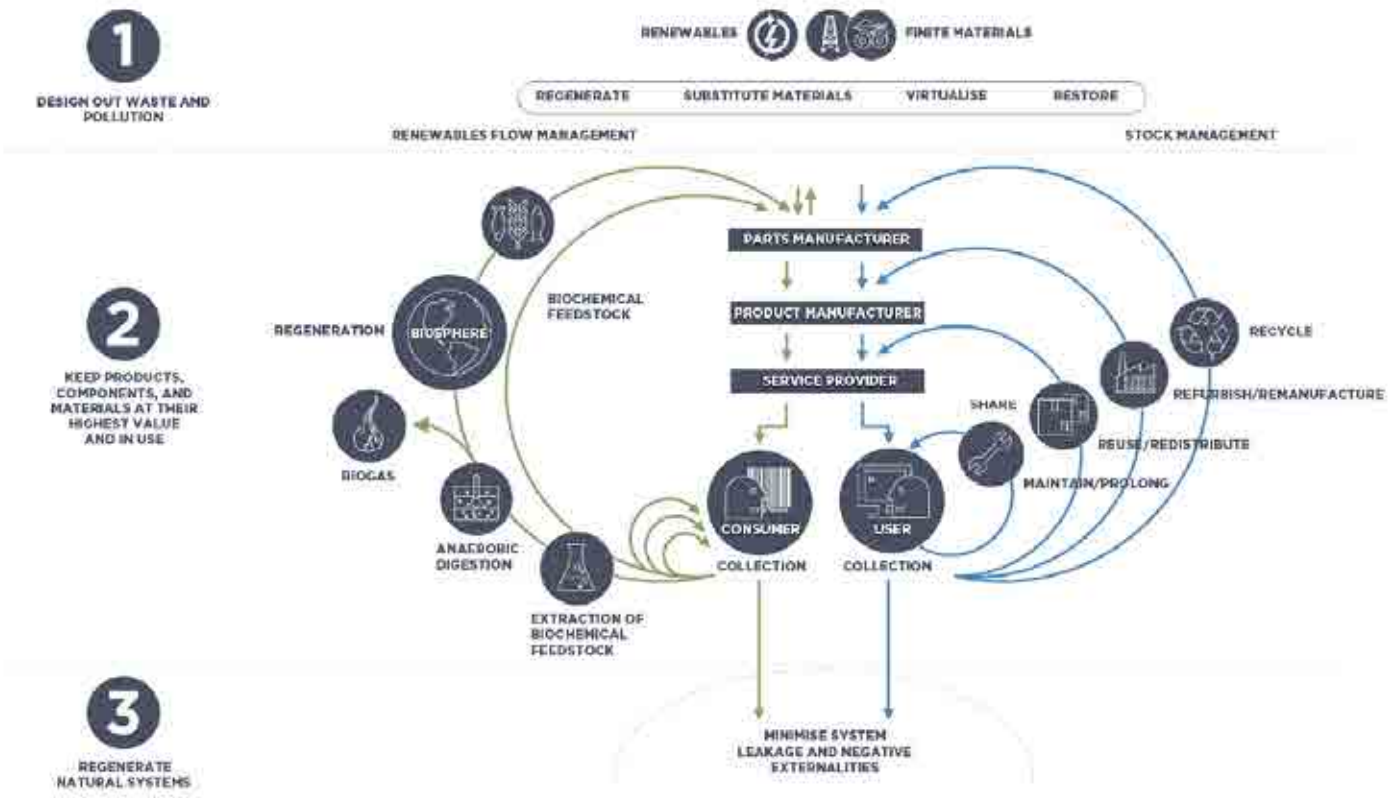
Like any economy, a circular economy can exist at any scale, starting locally and expanding into organisational supply chains and the global economy. True circularity maintains strong local roots to deliver enduring local benefits and value.

Economic and environmental opportunities from creating a more circular economy are clear and enticing. The globally-recognised Club of Rome found that countries from France to Finland can simultaneously grow jobs and reduce carbon emissions.

For instance, Finland could cut up to 70 per cent of its carbon emissions, France could gain half a million jobs, and Sweden could drop emissions by two thirds while adding jobs at three per cent of the labour force.

Read more on the Club of Rome website[210]

Figure 30 - Circular economy



Ridge to Reef: Auckland's marine environments and their relationship to the land

Auckland is defined by its three large harbours - the Hauraki Gulf, the Kaipara and Manukau harbours.

Smaller harbours, such as the Mahurangi and Whangateau harbours contribute further to Auckland's coastal setting.

Our marine environments are taonga. They are valued by Aucklanders for the range of uses they support, and for their intrinsic value as unique environments, which contribute to Auckland's identity.

They support a range of uses that include:

- habitat for unique species
- recreation
- fishing
- transport
- marine farming.

Marine environments are, however, under pressure from what happens in and on the water and, very importantly, what happens on the land. Our land and marine environments are connected, and depend on each other. All on-land activities have downstream impacts on our harbours.

Climate change will impact marine environments, which will in turn impact the land. We can expect more frequent storm events, increased risk of coastal erosion, and sea-level rise, which will impact on-land activities near the coast.

Read more at Knowledge Auckland[211]

How on-land activities impact our harbours

Stormwater, wastewater, litter, sediment and heavy metals all eventually end up in the harbours, and impact on their ecology. This compromises the things we value about the marine environment, like clean beaches, safe water for swimming and abundant kaimoana.

Sediment runoff from the land has a significant impact on streams and on the marine environment. Excessive sediment generation blankets important habitats, like seagrass meadows and shellfish beds. Sediment also affects water clarity, making it less pleasant for swimming and affecting plant growth.

Nutrients, especially nitrogen and phosphorus which are key components of fertiliser, have serious impacts as they can increase algae growth.

Impervious surfaces in our urban environments, like roads and carparks, collect heavy metals such as lead, nickel and zinc, which are quickly washed into streams and stormwater systems and then into the marine environment when it rains. Heavy metals are toxic to both people and animals, even at relatively low concentrations.

Even the relatively low population density across Auckland, and the infrastructure that supports it, has had a significant effect on our marine environment. As the city grows, develops and intensifies, we need to embed new ways of managing its impacts.

In some cases, growth is a great opportunity to improve the downstream impacts of land uses choices, for example, by improving how we manage and treat stormwater and wastewater.

In other cases, it creates additional pressure, with increased sediment generated during development, and more impervious surfaces resulting in more contaminants being washed into waterways.

Waste from urban areas also has an impact on marine environments.

Just like other contaminants, waste such as plastic bottles and packaging are easily transported downstream, eventually ending up in the sea. This waste affects many species, including birds, fish and marine mammals. It also reduces people's enjoyment of the marine environment.

To protect and enhance these special places we need to take a 'ridge to reef' approach, recognising that everything that happens on the land has a downstream impact.

Hauraki Gulf and Waitematā Harbour

Auckland's east coast is defined by the Hauraki Gulf and Waitematā Harbour. The Hauraki Gulf is internationally recognised as a significant marine environment.

In 2000, the Gulf's importance and diversity of uses was recognised by the creation of the Hauraki Gulf Marine Park. The marine park designation is for the protection of nationally and internationally important environments and recognises the Hauraki Gulf's quality as a habitat for species unique to New Zealand. Read more about the Hauraki Gulf Marine Park Act 2000 on the New Zealand Legislation website.[212]

The Hauraki Gulf supports diverse uses from aquaculture to tourism and recreation. Some of its islands, in particular Waiheke, support high levels of tourism, and some, such as Hauturu / Little Barrier, provide pest-free habitat for threatened species. The islands are treasured icons of the region.

The Gulf's beaches are loved as places to swim, surf and walk.

The range of habitats, from intertidal zones to open sea, provide habitat for species as diverse as shellfish, snapper, dolphins and whales, and the Gulf is an internationally significant seabird habitat.

Four marine reserves in the Hauraki Gulf also protect habitats and provide recreational opportunities, such as snorkelling at Goat Island in the Cape Rodney – Okakari Point marine reserve. Find out more on the Department of Conservation website.[213]

Auckland Council monitoring and research has tracked the impact of urban areas on the marine environment. The upper Waitematā, in particular, shows the stress of years of urban run-off, particularly through heavy metals in sediment, increased muddiness and high levels of *E*.coli bacteria at beaches, making them unsafe for swimming. Some beaches are now permanently closed for swimming. Find out more by reading Wai Ora-Healthy Waterways[214] and is your beach safe for swimming.[215]

Kaipara Harbour

Auckland's west coast, home to rugged black sand beaches, is also home to the Kaipara and Manukau harbours. The Kaipara is New Zealand's largest harbour, with over 800 km of coastline. Auckland Council and the Northland Regional Council share responsibility for the harbour.

The Kaipara is formed from a system of drowned river valleys, and is broad and shallow, famous for its unpredictable currents, shifting sands and treacherous entrance.

The Kaipara is home to diverse habitats, like seagrass in the shallow, upper reaches that support young snapper, and high current environments at the entrance that attracts large predators.

The Kaipara's catchments are mostly rural, with agriculture and forestry land uses dominating. There are however, urban and future urban areas, like Kumeu, Huapai and Helensville within the catchment.

These towns are forecast to grow and expand over the next 30 years. The key pressures on the Kaipara are sediment accumulation, *E*.coli bacteria and nutrient run off.

Manukau Harbour

Further south, the Manukau Harbour shares lots of similarities with the Kaipara, such as a significant tidal range and shallow form.

The Manukau's catchment is significantly more developed, with urban and industrial land use affecting its quality.

The Manukau supports a range of habitats for shellfish, fish and seabirds, and is fringed on its north-west corner by the Waitakere Ranges regional park, a significant environmental and recreational asset for the region.

Managing the pressures on our marine environments

The health of the harbours is an important element to Auckland's overall success in protecting the environment.

The choices Auckland makes about where and how we develop on the land, has a direct impact on the health of our harbours. The Auckland Unitary Plan[216] seeks to protect and enhance the marine environments, through setting rules for what activities can occur where.

Alongside that, there are other programmes underway which aim to improve the health of our marine environments. Auckland Council's water quality programme[217] provides an overall framework for driving better water outcomes, for which a protected and enhanced marine environment is a key goal.

The following are some examples of programmes underway:

A collaborative Marine Spatial Plan for the Hauraki Gulf: SeaChange Tai Timu Tai Pari

This plan was produced by an independent working group, and released in December 2016.

SeaChange[218] is non-statutory and non-binding on any organisations. The plan sets an ambitious vision, aiming to ensure that the positive health of the Hauraki Gulf is the key planning objective for all activities in the gulf and in all its catchments. The objectives of the plan provide a basis for collaboration between organisations active in the Gulf.

The Wai Ora Healthy Waterways programme

The Wai Ora Healthy Waterways programme[219] was established to implement the National Policy Statement for Freshwater Management.

The programme's objectives are to support communities in caring for freshwater and coastal environments, address the complex water issues in Auckland and meet the Auckland Unitary Plan's water management requirements.

The approach recognises that what happens on the land has direct impacts on the marine environment.

Integrated watershed plans

These plans are developed in partnership by the Auckland Council and local communities. They are designed to improve both freshwater and marine environments.

The plans are based on assessing the current state of catchments, the values and goals that the community identifies for the catchment, and take into account their implementation cost.

Improving our freshwater environments has direct, downstream impacts on marine environments. The plans are being developed progressively for each watershed.

Improvements to infrastructure

Improved infrastructure delivers better outcomes for our marine environment. As Auckland's population has grown, there has been increasing pressure on wastewater and stormwater networks, resulting in the systems overflowing, severely reducing marine water quality, limiting the number of days it's safe to swim and affecting the safety of kaimoana.

These networks also struggle to cope with the volumes of litter they must trap.

Watercare's asset management plan

Watercare's asset management plan[220] details how it will upgrade the water and wastewater infrastructure to improve environmental impacts and to keep up with forecast population growth and urban spread. Auckland Council management of stormwater infrastructure is detailed in its Stormwater Asset Management Plan.[221]

Water sensitive design

This design places water quality and water conservation at the heart of urban design and development. The goal is to protect and enhance natural freshwater systems, sustainably managing freshwater resources and mimicking natural processes.

Implementing water sensitive design has benefits for freshwater and marine receiving environments. Water Sensitive Design is supported in the Auckland Design Manual.[222]

State of environment monitoring programmes

Auckland Council operates several long-term programmes that monitor the health of the Hauraki Gulf. These programmes report on a range of marine data, including water quality, ecology and sediment.

These marine water programmes are complemented by a freshwater monitoring programme, and data is reported regularly[223] The Hauraki Gulf Forum[224] publishes an integrated triennial report, which includes data from its member organisations, such as the Department of Conservation, Ministry of Primary Industries and local councils.

Safeswim monitoring programme

The Safeswim website[225] currently provides Aucklanders with water quality forecasts and up-to-date information on risks to health and safety at 84 beaches and 8 freshwater locations around Auckland.

Safeswim is a joint initiative between Auckland Council, Watercare, Surf Lifesaving Northern Region and the Auckland Regional Public Health Service. The programme is being upgraded to provide improved real-time information, and to integrate other information such as rainfall, tides and currents.