

POTENTIAL THREATS TO THE ECOLOGY OF CLIFFTOP COASTAL PŌHUTUKAWA FOREST WITHIN THE ŌRĀKEI WARD, AUCKLAND

In 2015 Tamaki Drive Protection Society commissioned Wildland Consultants Ltd to survey the cliffs in the Orakei Ward from Mechanics Bay to Kēpa Reserve in the west and to Achilles Point in the east. A desktop analysis of vegetation within the coastal yard was followed by a ground-truth survey of the vegetation, and assessment of the threats to the pōhutukawa forest. The final stage extends the survey from Achilles Point to the border with Tahua Torea. The Survey was funded by Orakei Local Board. This fact sheet covers some of the findings of the Survey. The full survey reports are available to read on our website: www.tamakidrive.org.nz

Fact Sheet 1: Coastal Ecology and Threats

The Tāmaki Ecological District, which encompasses the heavily urbanised isthmus between the Manukau and Waitemata Harbours, is one of the most modified ecological districts in New Zealand and is continuing to change as urbanisation intensifies. The Survey of Cliff-top Pōhutukawa Forest states that the impact and spread of many introduced plants was intensified by the changing landscape, clearance of bush, filling of shallow wetlands, and suppression of indigenous restoration in areas otherwise suitable for development. Today 32% of Tāmaki Ecological District lies on ‘Acutely Threatened’ Land Environments. Tāmaki Drive is characterised by planted pōhutukawa along the coastal walkway from Okura Point to Achilles Point. Small remnant forests throughout Tāmaki Drive are dominated by pōhutukawa with occasional karaka (*Corynocarpus laevigatus*), ngaio (*Myoporum laetum*), pūriri (*Vitex lucens*), tarata (*Pittosporum eugenioides*) and karamū (*Coprosma robusta*). Mixed exotic shrubland and scrub dominate the open coastal cliffs while pōhutukawa form the dominant canopy along the seaward side of the road.

Parks and reserves are characterised by specimen trees of pōhutukawa and large exotic species such as sheoak (*Allocasuarina littoralis*), Moreton Bay fig (*Ficus macrophylla*), Norfolk pine (*Lagunaria patersonia* subsp. *patersonia*) and Queensland brush box (*Lophostemon confertus*).

Further information on coastal ecosystems

Coastal ecosystems typically occur within 100–200 m of the shoreline. Their biota and physical environments are strongly influenced by salt, wind, and exposure. Some of the 13 naturally uncommon ecosystems in coastal environments have been severely degraded by human activities and feral animals, resulting in substrate disturbance, weed invasion and erosion. Coastal development remains an ongoing threat to these ecosystems. <http://www.landcareresearch.co.nz/publications/factsheets/rare-ecosystems/coastal>

Development.

Residential and commercial development of the coastal cliff-tops near urban centres is considered desirable by people throughout the world, and therefore poses a risk for the success of indigenous species that would otherwise occupy that area (Buxton 2012). The east coast of the Auckland region will likely continue to experience property loss and/or damage due to dense urban development on the top of actively eroding coastal cliffs (City of Auckland 2015). Development in potential hotspots poses a risk to the survival of the pōhutukawa forest and associated ecosystem within these areas, some of which are characterised by steep coastal cliff. The pōhutukawa fringe along Auckland’s coastal cliffs makes a significant contribution to the visual amenity of the city’s coastline and helps to slow down the rate of natural erosion (Auckland Council 2012b). Pōhutukawa has evolved to thrive on exposed, coastal rock faces, and it has aerial roots that can re-sprout if a slip occurs. The roots of pōhutukawa stabilise the soft sedimentary rock that characterises much of Auckland’s coastline.

ECOLOGICAL THREATS: invasive exotic plants

Invasive exotic plant species

In Auckland, the number of exotic species vastly outnumbers that of indigenous species, resulting in the claim of Auckland being one of the weediest cities in the world (Esler 1988). Over 200 are identified as noxious weeds. Weed invasion is a serious threat to the ecological integrity of indigenous vegetation, including vegetation on coastal cliffs throughout the country. **Pest plant threats to indigenous coastal vegetation and habitats were specifically identified by the New Zealand Plant Conservation Network.**

The pest plant threats: gorse, ice plant (*Carpobrotus edulis*), pig's ear (*Cotyledon orbiculata*), boneseed, evergreen buckthorn (*Rhamnus alaternus*) and Chilean rhubarb (*Gunnera tinctoria*). Of these species, evergreen buckthorn is of most concern in the cliffs surrounding the Ōrākei Ward.

Evergreen buckthorn is an aggressively growing perennial evergreen shrub that grows to 5-8 m in height and is prevalent throughout coastal areas in Auckland. Evergreen buckthorn has the ability to out-compete pōhutukawa and other indigenous plants by colonising available ground space, eventually excluding all other species (Fromont 1997).



Boneseed

Photos: Auckland Council PlantSearch



Evergreen buckthorn

Auckland Council biodiversity team supports community initiatives and may provide grants and funding.

“Protecting and enhancing our indigenous ecosystems and species is critical to Auckland's environmental, social and economic wellbeing... We can provide the public with advice on protecting and enhancing native plant and animal species; advice and plans for restoring ecosystems; advice on funding and protection mechanisms; ecological advice and support to private landowners (rural and urban) and community groups.”

<http://www.aucklandcouncil.govt.nz/en/environmentwaste/biodiversity/pages/ourbiodiversityservices.aspx>

To request a site visit from a council expert, or to get advice or assistance protecting, restoring or enhancing biodiversity on your property, [email the biodiversity team](#) or phone 09 301 0101.

A change in vegetation protection rules following the Streamlining and Simplification Amendment (2009) resulted in many trees being felled in urban Auckland. Although pruning of trees that are not otherwise protected is permitted without the need for consent in certain areas, the tree must not be damaged or destroyed during pruning, maintenance or other activity in the vicinity, or within the dripline, of the tree. Furthermore, if a tree is removed or destroyed, a replacement tree or trees must be provided elsewhere on the site or in the vicinity, where appropriate (the size and species must be approved by the Council; Auckland Council 2012b). Care should therefore be taken to prevent damage or mortality to any tree that is pruned. Furthermore, tree regulations should be consulted, particularly if the tree is located near the coast or near a coastal cliff, to ensure the correct rules are being followed as many tree rules still apply. (Survey Report)

Further Information on resources.

Dept of Conservation also recommends using resources from the Weedbusters website. Weedbusters aim to make New Zealanders aware of weeds and to take action to reduce the impact of weeds on the environment, economy and human health. Their goals are: Ensure that the New Zealand population is aware of the threat of weeds; increase the number of people participating in managing the weed problem; help all agencies involved in weeds work to share resources and provide clear and consistent messages; secure ongoing funding for the Weedbusters programme. Here is a link to the weedbusters website for boneseed and evergreen buckthorn.

[http://www.weedbusters.org.nz/weed-information/chrysanthemoides-monilifera-subspecies-monilifera/59/;](http://www.weedbusters.org.nz/weed-information/chrysanthemoides-monilifera-subspecies-monilifera/59/)

<http://www.weedbusters.org.nz/weed-information/rhamnus-alaternus/59/>

Regional councils and DOC provide resources to weedbusters and they fund a number of programmes.

Restorative Plants and Planting see Fact Sheet 2

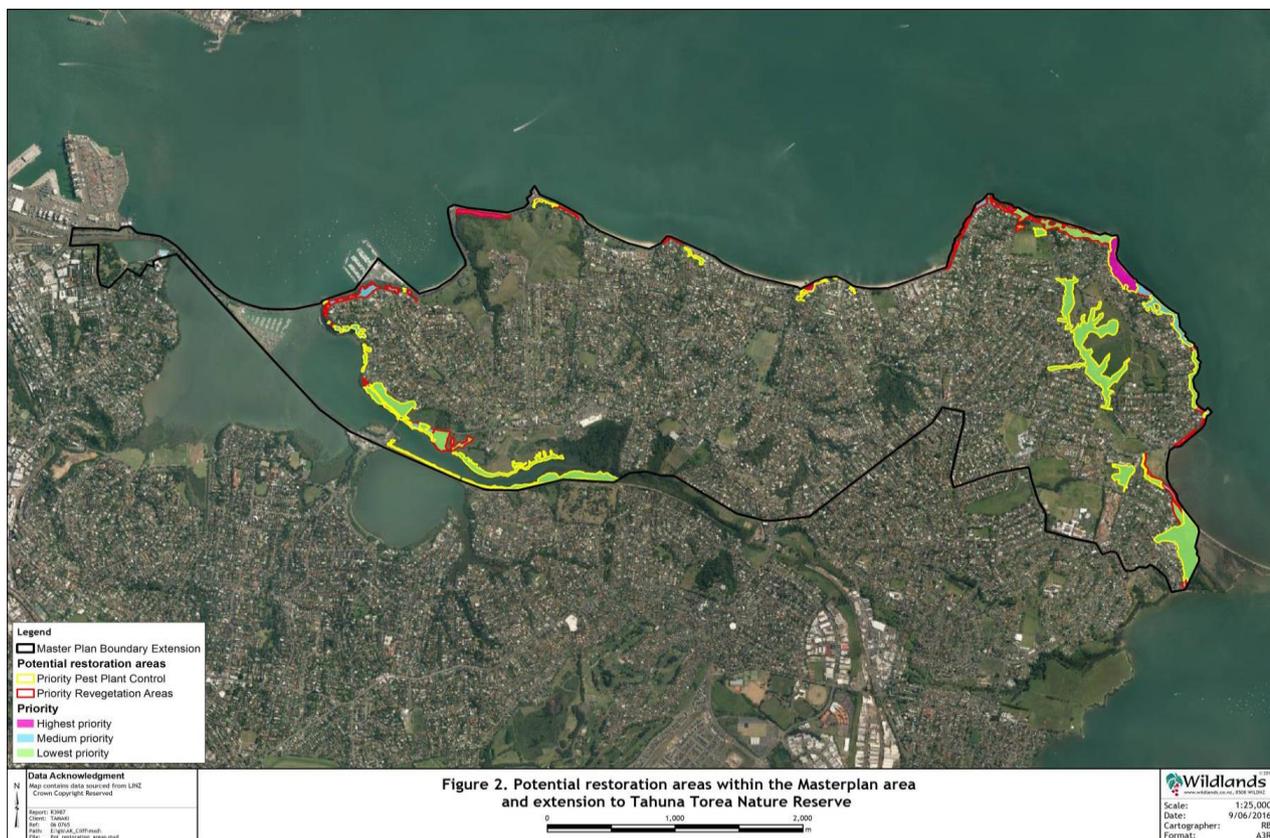
Full Survey reports are on Tamaki Drive Protection Society website: www.tamakidrive.org.nz

POTENTIAL THREATS TO THE ECOLOGY OF CLIFFTOP COASTAL PŌHUTUKAWA FOREST WITHIN THE ŌRĀKEI WARD, AUCKLAND

In 2015 Tamaki Drive Protection Society commissioned Wildland Consultants Ltd to survey the cliffs in the Orakei Ward from Mechanics Bay to Kepa Reserve in the west and to Achilles Point in the east. A desktop analysis of vegetation within the coastal yard was followed by a ground-truth survey of the vegetation, and assessment of the threats to the pōhutukawa forest. The final stage extends the survey from Achilles Point to the border with Tahua Torea. The Survey was funded by Orakei Local Board. This fact sheet covers some of the findings. The full survey reports are available to read on our website: www.tamakidrive.org.nz

Fact Sheet 2: Restorative Plants and Planting

Planting and revegetation. The most effective means of improving and maintaining the ecological integrity of the coastal forest within the project area are pest-plant control followed by revegetation planting and maintenance. Revegetation should be undertaken along steep coastal cliffs, within associated riparian and coastal margins and in exposed areas to offset the adverse effects of development within otherwise high-risk areas in terms of stability. Appropriate indigenous plants and tree species should be planted to enhance the ecological values of the coastal area as well as improve cliff stabilisation and reduce the risk of erosion. A map of areas suitable for revegetation is provided. Priorities are identified by colour with areas specified as revegetation and/or pest plant control only; and an indicative planting schedule is below.



Planting Guide

Species	Common Name	Grade	Spacing (m)
<i>Carex flagellifera</i> ²	0.5L	1.4	
<i>Coprosma repens</i> ²	taupata	2L	1.4
<i>Coprosma macrocarpa</i> subsp. <i>minor</i> ²	coastal karamū	0.5L	
	tī kōuka	0.5L	1.4
<i>Cordyline australis</i> ¹			
<i>Entelea arborescens</i> ³	whau	2L	5
<i>Hebe stricta</i> ²	hebe	0.5L	1.4
<i>Kunzea robusta</i>	kānuka	0.5L	3
		3	

<i>Melicytus ramiflorus</i> subsp. <i>ramiflorus</i> 3	māhoe	2L	1.4
<i>Metrosideros excelsa</i> 3	pōhutukawa	2L	5
<i>Myoporum laetum</i> 3	ngaio	0.5L	3
<i>Pittosporum crassifolium</i> 3	karo	0.5L	1.4
<i>Plagianthus divaricatus</i> 1	Saltmarsh ribbonwood	0.5L	1.4
<i>Pseudopanax lessonii</i> 3	houpara	0.5L	1.4
<i>Sophora chathamica</i> 3	kōwhai	2L	5

Categories of Pest Plants

(i) Total Control Pest Plants

Total Control Pest Plants have a limited distribution or density within the Auckland Region, or defined areas of the Region. They are considered to be of high potential threat to the Region, and the Auckland Council assumes full responsibility for funding and implementing appropriate management programmes for these species. The aim is to eradicate these plants from the Region or defined areas of the Region, over a period of time, which may exceed the life of the current RPMS (ARC 2007).

(ii) Containment Pest Plants

Containment pest plants are those that are abundant in certain habitats or areas in the region. Landowners/occupiers are required to control these plants whenever they appear on their land. There are two categories of Containment Pest Plants:

Removal – Landowners/occupiers are required to completely remove these pest plants from their properties.

Boundary Control – Landowners/occupiers are required to maintain control of these pest plants to a specified distance from all property boundaries, if the neighbouring property is clear of the pest plant. All containment pest plants are banned from sale, propagation, distribution, and exhibition through the entire Auckland Region.

(iii) Surveillance Pest Plants include species that have been identified as having significant impacts on the biosecurity values of the Auckland Region. The Auckland Council seeks to prevent their establishment or spread by prohibiting their sale, propagation, distribution, and exhibition.

Control is recommended also for environmental pest plant species that are present in small to moderate amounts within the project area and are not identified in the RPMS.

The Regional Pest Management Strategy (RPMS) is the guiding document for pest control programmes, setting priorities and goals for managing animal and plant pests in Auckland. The strategy is being updated as a 10-year plan for the region. The proposed Regional Pest Management Plan will be notified in 2017 for submissions and hearings.

www.aucklandcouncil.govt.nz/EN/environmentwaste/biosecurity/Pages/regionalpestmanagementstrategy.aspx

Further Information from Dept of Conservation.

Potential urban/residential development poses the biggest threat to the ecological integrity of the remaining pōhutukawa forest. This is associated with the threat of clifftop instability. The death of indigenous vegetation due to trimming or pruning can be avoided by following best practice arboricultural techniques or by hiring professionals to carry out the work. Removal of indigenous vegetation should be avoided, particularly in areas that are vulnerable to erosion or slumping. Instability can be largely remedied by the retention and revegetation of indigenous coastal forest, particularly pōhutukawa. Competition by pest plants is likely the most serious threat in terms of preventing the regeneration of the coastal forest, but is placed behind residential development of instable cliffs due to the ecological importance of retaining remaining pōhutukawa forest. Indiscriminate trimming or pruning of indigenous species, particularly pōhutukawa, may result in the compromised survival of individuals and is therefore also a potential threat, along with some diseases and *browsing pest animals*. www.doc.govt.nz/nature/pests-and-threats/animal-pests.

**Further information: The full Survey reports may be read on website: www.tamakidrive.org.nz
Tamaki Drive Protection Society**

Ecological threats: Browsing Pest Animals See Fact Sheet 3

POTENTIAL THREATS TO THE ECOLOGY OF CLIFFTOP COASTAL PŌHUTUKAWA FOREST WITHIN THE ŌRĀKEI WARD, AUCKLAND

In 2015 Tamaki Drive Protection Society commissioned Wildland Consultants Ltd to survey the cliffs in the Orakei Ward from Mechanics Bay to Kepa Reserve in the west and to Achilles Point in the east. A desktop analysis of vegetation within the coastal yard was followed by a ground-truth survey of the vegetation, and assessment of the threats to the pōhutukawa forest. The final stage extends the survey from Achilles Point to the border with Tahua Torea. The Survey was funded by Orakei Local Board. This fact sheet covers some of the findings. The full survey reports are available to read on our website: www.tamakidrive.org.nz

Ecological threats: Browsing Pest Animals Fact Sheet 3

Possums and Rats

Browsing pest animals, particularly the brushtail possum (*Trichosurus vulpecula*), has caused severe damage to indigenous vegetation in New Zealand (Fitzgerald 1981). Eradication of possums from inshore and offshore islands has resulted in forest recovery (Atkinson 1992). Possum control on the mainland is limited due to the wide distribution of the pests, rapid reinvasion of controlled sites, and limitations in current control methodologies.

Few successful pest animal control projects have been documented within the Masterplan area, probably due to the fragmented nature of the green space present in the area and the fact that most of it is in private ownership. Pest animals such as rats (*Rattus* spp.), stoats (*Mustela erminea*) and possums are being controlled within some parks and reserves by community groups, iwi and/or landowners, e.g. Mechanics Bay, Kepa Bush Reserve, Bastion Point, Churchill Park and Point England Reserve (Predator Free NZ 2014).

Increased levels of possum control, particularly within private property, would result in resurgence of pōhutukawa as pressure by browsing mammals would be reduced. Potential risks of browsing by pest animals can be minimised by trapping and baiting to reduce possums that browse pōhutukawa.

Pulsed control techniques should be used in areas that are difficult to access or have limited support (e.g. in terms of funding and/or personnel), whereby bait stations are refilled twice per year (filled every second day for two week pulses). Pulsed control is the most effective animal pest control approach in areas that cannot be regularly serviced otherwise.

If support is available, establishing and maintaining permanent traps and bait stations will result in effective and ongoing pest animal control. Ideally, private residences near regenerating pōhutukawa forest will maintain bait stations and traps on their own property; however, a community group that undertakes pulsed control is likely to be more effective at carrying this out.

Gecko NZ Trust is a community organisation that supports neighbourhood-based restoration approaches including pulsed pest animal control programmes.



Possum and rat both preying on a thrush nest

Photo: Nga Manu Nature Images

The four rodent species in New Zealand are introduced pests. The European house mouse and the three species of rats threaten the long-term survival of native species. The three species of rat are the Pacific rat/kiore, ship or common rat, and Norway or brown rat. Kiore eat a wide range of foods including seeds, fruits, insects, lizards, eggs and chicks. New Zealand's native plants and animals evolved without predators and are unable to compete with introduced species. Kiore are not protected under New Zealand statutes.



Comparison of rat pellets



Ship rat in fantail nest: [Nga Manu Nature Images](#)

Further information.

Signs that rats are present: Remains of food such as seeds or snail shells can be found under cover like hollow logs, or amongst tree roots. Sometimes nests of loosely woven twigs and leaves can be found in tree holes, or in burrows in the case of Norway rats. Droppings are cylindrical and stubby, sometimes tapering to a point. Norway rat pellets are about 16mm long, roughly twice the length of other rat pellets. Norway rats excavate burrows 60-90 mm in diameter, often beneath cover such as rocks or tree roots. They can excavate large volumes of soil, and often hoard food in their burrows. Pathways 50-100mm wide link burrows with feeding sites, and these paths can become well worn trails. (DOC Website)

The NPCA run website that has information about a range of pest animals in NZ, and links to their control <http://www.pestdetective.org.nz/next-steps/vertebrate-pest-control-resources/>

Predator Free NZ

A DOC project team was set up to facilitate the Government's Predator Free 2050 goal with the public and private sector. The public response so far indicates people feel connected to the vision of a predator free New Zealand to rid the country of possums, stoats and rats and the goal creates a national focus on eradication. New funding of \$28m over four years and \$7m per year thereafter will help get the ball rolling, establishing a new company to invest in large-scale initiatives and scientific research, and attract investment from the private sector, philanthropists and local government. The path to [Predator Free 2050](#) will evolve as the contributors develop strategies. ...The goal aligns strongly with our strategy of working together to create greater collective impact and is a natural fit with our existing stretch goals, work programmes and relationships. Connections will be created with more of our existing work such as [Battle for our Birds](#), collaborating on new research and developing breakthrough technologies. The [Predator Free New Zealand Trust](#) will continue its focus on community participation and achievement and being a central place for information about who is doing what.

PF2050 is focused on the eradication of rats, possums and stoats. Enquiries about getting involved at the community level can be directed to the Trust's website: <http://predatorfreenz.org/> If you have questions, suggestions or require talking points or slides to include in a presentation, please contact predatorfree2050@doc.govt.nz

**Further information: The full Survey reports may be read on website: www.tamakidrive.org.nz
Tamaki Drive Protection Society**

